APPENDIX A
NOTICE OF PREPARATION

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
628.652.7600
www.sfplanning.org

PUBLIC NOTICE

NOTICE OF PREPARATION OF AN ENVIRONMENTAL IMPACT REPORT AND NOTICE OF A PUBLIC SCOPING MEETING

Date:	July 2, 2025
Comment Deadline:	August 1, 2025
Case No.:	2024-005922ENV
Project Title:	Pier 92 Modernization and Plant Replacement Project
Project Address:	480 Amador Street
Zoning:	M-2 Heavy Industrial Use District
Height/Bulk:	40-X Height and Bulk District
Block/Lot:	4502A/002
Lot Size:	190,229 square feet (4.37 acres)
Neighborhood:	Bayview
Supervisor District:	District 10
Cross Streets:	Illinois Street and Cargo Way
Staff Contact:	Jennifer McKellar; (628) 652-7563 CPC.Pier92EIR@sfgov.org

Introduction

The San Francisco Planning Department (department) prepared this notice of preparation of an environmental impact report (EIR) and notice of a public scoping meeting in connection with the proposed Pier 92 Modernization and Plant Replacement Project (proposed project). The California Environmental Quality Act (CEQA) requires public agencies to evaluate environmental impacts prior to approving any project and to reduce those impacts to the degree feasible. The purpose of an EIR is to:

(1) provide information about potential significant physical environmental effects of a proposed project,

(2) identify possible ways to reduce the significant effects, and

(3) describe and analyze possible alternatives to the project that could reduce significant environmental effects.

This notice informs the public, responsible and trustee agencies, and interested parties that the department is preparing an EIR in compliance with CEQA and the State CEQA Guidelines. This notice describes the proposed project, the EIR process, and how to provide input on the environmental review. This notice also identifies environmental issues anticipated to be analyzed in the EIR. The comments received during the public scoping process will be considered during preparation of the EIR for this project.

An in-person public scoping meeting will be held at 6:00 p.m. on July 16, 2025, at the Southeast Community Center, 1550 Evans Avenue. Comments will be accepted in person at the scoping meeting and in writing until 5:00 p.m. on August 1, 2025. Written comments should be sent to Jennifer McKellar, San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103, or emailed to CPC.Pier92EIR@sfgov.org.

This notice is available for public review on the department's website at sfplanning.org/sfceqadocs and at the San Francisco Permit Center's document viewing room on the second floor of 49 South Van Ness Avenue, San Francisco, CA 94103.

Project Overview

Introduction

The Pier 92 Modernization and Plant Replacement Project (proposed project) consists of the reconstruction and modernization of the existing sand processing facility on Pier 92 at the Port of San Francisco (Port). The proposed project would install and operate a new sand processing system with new equipment, enhanced environmental controls, and other site upgrades. A key element of the project modernization is the installation of enhanced dust control measures. This would be achieved by retrofitting or replacing conveyors with covers and covering the finished material stockpile and truck-loading areas to reduce particulate emissions and fugitive dust from transfer and storage of the material. The essential nature of the existing operations at the facility would not change under the proposed project.

Project Setting and Site Characteristics

PROJECT SITE AND ADJACENT LAND USES

The Pier 92 facility is located at 480 Amador Street in San Francisco's Bayview neighborhood (see Figure 1, p. 3). The project site is also in the Port's Maritime Eco-Industrial Center and the Southern Waterfront area of the Port's Waterfront Plan. The site occupies a portion of Assessor's Block 4502A, Lot 002 in an M-2 Heavy Industrial Use District and 40-X Height and Bulk District. The project site is bounded by Islais Creek Channel to the north, the Pier 94 wetlands to the east, Seawall Lot (SWL) 352 and Piers 94 and 96 to the south, and Amador Street to the west. At its southern end, there is a right-of-way that provides public access to the Pier 94 wetlands. Surrounding land uses include Darling Ingredients, Inc.; CEMEX; and Central Concrete Supply to the west and vehicle parking to the south. The project site is within an environmental justice community, per Senate Bill (SB) 1000.[1] The site is also within an Assembly Bill (AB) 617 community: Bayview Hunters Point/Southeast San Francisco.[2]

[1] SB 1000 requires jurisdictions that have disadvantaged communities to incorporate environmental justice into their general plans upon the next revision to two or more elements. The project site is not within a disadvantaged community, based on the definition in SB 1000, but communities are encouraged to conduct analysis to define additional areas facing environmental and health challenges. The San Francisco Planning Department conducted additional analysis to identify areas in the city that face a disproportionate burden of environmental health challenges, informed by state and local data, resulting in the Environmental Justice Communities Map. For more information, see https://sfplanning.org/project/environmental-justice-framework-and-general-plan-policies#ej-communities.

[2] An AB 617 community is affected by a high cumulative exposure burden from toxic air contaminants and criteria air pollutants (Source: Bay Area Air District, 2022 CEQA Guidelines, Chapter 2, Best Practices for Centering Environmental Justice, Health, and Equity. Available: https://www.baaqmd.gov/~/media/files/planning-and-research/ceqa/ceqa-guidelines-2022/ceqa-guidelines-chapter-2-environmental-justicefinal-pdf.pdf?rev=724445e52f394fe1ab3d3b1636b6d023&sc_lang=en).



Graphics ... Martin_Marietta\105407_Pier_92_NOP (6-4-2025)

Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 1
Project Location

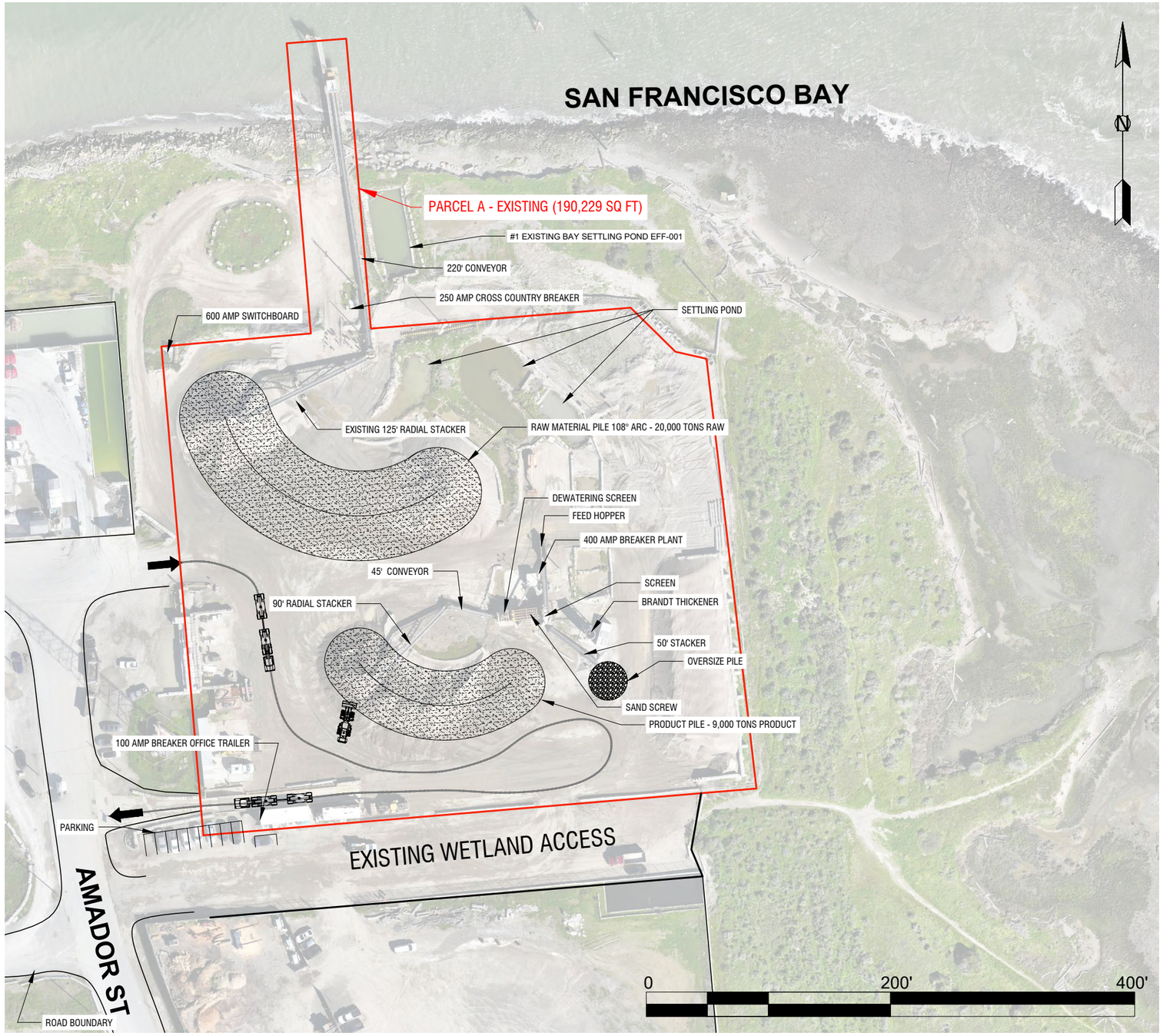
EXISTING SITE CHARACTERISTICS

The 190,229-square-foot Pier 92 facility has been used for marine sand offloading and processing since at least 1982. The site is currently unpaved, with the exception of the area after the scale, which is paved. The sand offloaded at Pier 92 is used in a variety of applications in many different projects throughout the city and the Bay Area. Sand is a crucial component in concrete and asphalt and is essential for development, infrastructure, and restoration projects, including beach and shoreline restoration projects.

Marine sand is delivered to the Pier 92 facility by barge from the Islais Creek Channel along the northern boundary of the project site (see Figure 2, p. 5). The essential operations of the facility are as follows:

> Step 1. Marine sand is offloaded and stockpiled: Marine sand is offloaded via conveyor from the barge to the shore. The sand is saturated with water upon arrival and during unloading. The unloading conveyor moves the sand south onto the site where it is stored in a stockpile (raw material stockpile) using a radial stacker and is kept wet with sprinklers. Unwashed sand for sale is transferred by loader to customers' trucks for delivery offsite.
>
> Step 2. Raw material is transferred to the wash plant: Wet sand is moved from the raw material stockpile to the wash plant by a front-end loader. The loader scoops sand from the stockpile and places it into a feed hopper at the wash plant.
>
> Step 3. Raw material is screened and washed at the wash plant: The wash plant consists of a feed hopper and specifically designed conveyor with sand washing equipment that submerses the sand in water. Sand is screened in the wash plant and oversized sand is moved to the oversized stockpile via a stacker. Washed sand is conveyed over screens that remove any non-sand material, such as oversize pea gravel and shells. The remaining sand is processed further in the wash plant. The processing screen and stockpiles are not required to be covered, per Bay Area Air Quality Management District (Air District) regulations.
>
> Step 4. Product sand is transferred to the product stockpile: The washed sand (product sand) is transferred to the product stockpile using a conveyor and radial stacker, which are not required to be covered per Air District regulations.
>
> Step 5. Product sand is transferred to customer trucks: Sand from the product stockpile is transferred via loader to customers' trucks for delivery offsite. Martin Marietta does not own nor operate any haul trucks. Customers transport the material or contract for delivery to end users and construction sites presently located throughout the city and San Mateo County. As trucks depart the site, they pass through environmental controls to reduce track out of sand and fugitive dust emissions, including a wheel wash and track-out control mat. Trucks return to Amador Street near the southwest corner of the property.

The volume of sand processed at the Pier 92 facility has varied substantially over the past 25 years, reflecting the cyclical nature of the construction industry. A peak of approximately 664,000 tons of sand was processed in 2018, while only 118,000 tons was processed in 2011. Based on historical sales data, Martin Marietta estimates that approximately 65 to 75 percent of the sand offloaded at the facility is transported by truck to the two adjacent ready-mix concrete facilities located on Pier 92.



Source: Martin Marietta, 2025

Graphics - Martin_Marietta\105407_Pier_92_EIR (6.18.2025)

Pier 92 Modernization and Plant Replacement Project
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Figure 2
Existing Operation

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PROPOSED PROJECT CHARACTERISTICS

The proposed project would modernize and reconstruct the existing sand processing facility by installing new equipment, constructing a new warehouse, and paving and reconfiguring the site (see Figure 3, p. 9). No changes are proposed to Pier 92 infrastructure or facilities located outside of the project site's boundaries. The essential nature of the existing operations at the facility would not change. Rather, the proposed project would allow for the existing operation to continue on a redesigned site with modern equipment and improved environmental controls. To accommodate these changes, the project is also proposing an increase in site size under a new lease with the Port of San Francisco and has applied for a permit to construct/permit to operate from the Air District. Table 2-1 presents a comparison of existing facility characteristics and proposed changes.

Table 2-1: Existing vs. Proposed Project Summary

Use/Feature	Existing	Proposed	Net Change
Industrial use (square feet [sf])	190,229	224,600	34,371
Number of building(s)[a]	0	1	1
Building stories	0	1	1
Building height (feet)	0	63[b]	63
Building area (sf)	0	30,800	30,800
Annual sand processing throughput (U.S. tons)[c]	349,078	800,000	450,922
Number of employees	5	6	1
Site surface paving (sf)	0	63,330	63,330
Vehicle parking spaces (employee/visitor)	10	10	0

Notes:

a. Refers to permanent buildings. Does not include temporary structures such as trailers or storage containers.

b. Height noted is highest roof point and does not necessarily reflect the building height as measured, per the San Francisco Planning Code. In addition, Section 260(b)(2)(M) of the San Francisco Planning Code (Code) exempts from the height requirement all structures and equipment necessary for the operation of industrial plants, where structures and equipment do not contain separate floors and where permitted as principal or conditional uses by the Code.

c. Given the cyclical nature of the facility's operations, existing conditions are based on the facility's average activity over the most recent 5-year operating period (years 2020–2024), not maximum activity achieved over the facility's history. Proposed conditions are based on the maximum annual throughput requested by the project sponsor in its application to the Air District for a permit to operate.

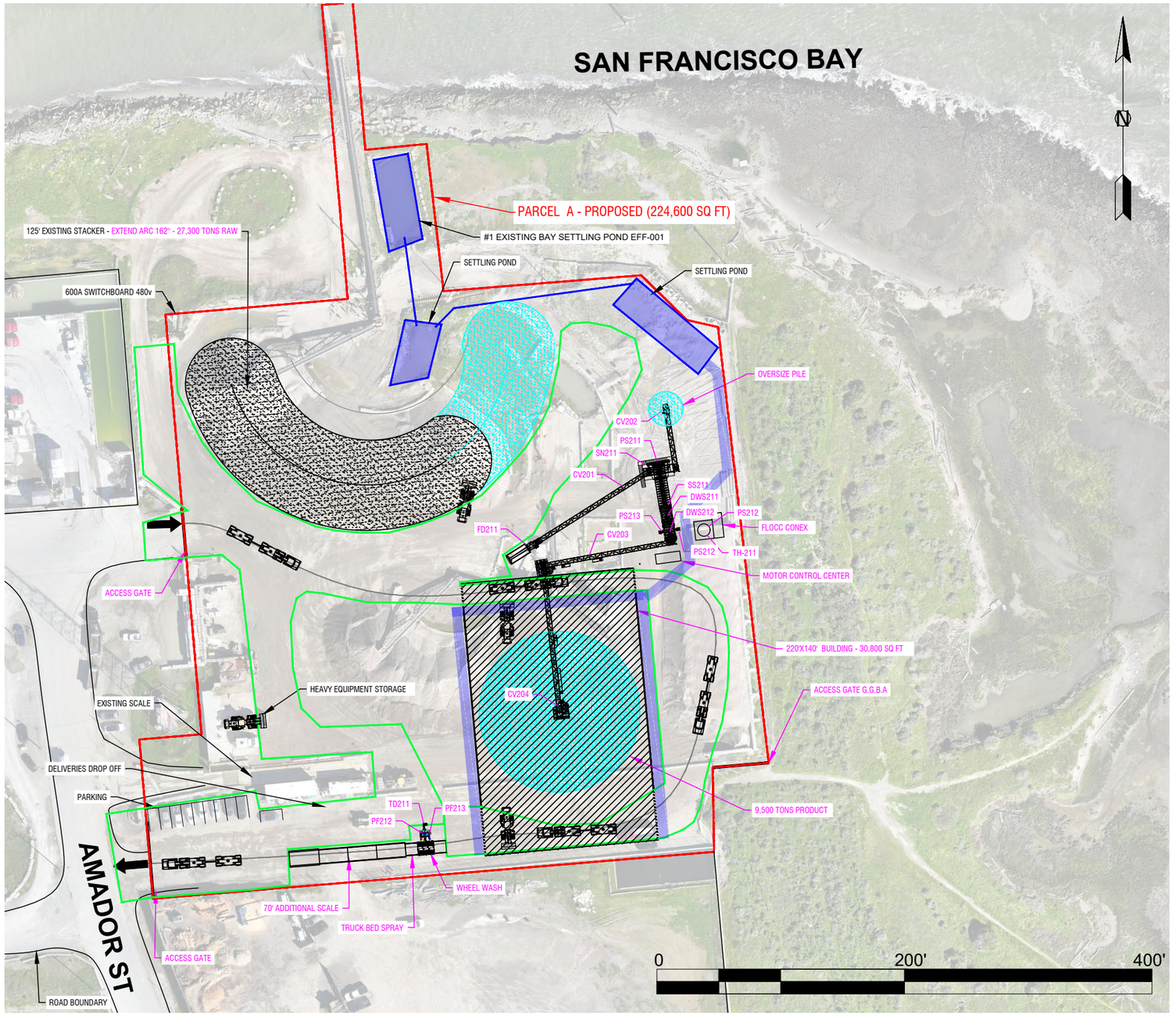
Approximately 34,371 square feet is proposed to be added to the existing 190,229-square-foot parcel (Parcel A), increasing its size to 224,600 square feet. Two areas would be added to Parcel A: 1) an adjacent L-shaped rectangular area to the south, adding 34,091 square feet, and 2) a smaller adjacent area to the north that would be realigned to include an existing stormwater retention pond (EFF-001), changing the overall net square footage in this area by 280 square feet (see Figure 4, p. 10).

The area to the south is currently used by the public to access the Pier 94 wetlands area east of the project site. Access to the Pier 94 wetlands would be relocated approximately 700 feet southeast of the project site on Amador Street. The Port would be responsible for implementing the improvements associated with the relocated access gate, which includes adding a new access gate on Amador Street and another access gate to the wetlands (see Figure 5, p. 11).

Wet marine sand would continue to be delivered to the facility via barge from the Islais Creek Channel. The following describes the proposed facility process changes (see Figures 6 through 14, pp. 12 through 20, for diagrams of new equipment proposed by the project):

> Step 1. Marine sand is offloaded and stockpiled: The saturated sand would continue to be offloaded and moved onto the site via an uncovered conveyor belt/radial stacker and stored in an uncovered raw material stockpile. A new overhead water spray system would be installed above the raw material stockpile to replace the existing sprayer. Unwashed sand for sale would continue to be transferred by loader to customers' trucks for delivery offsite.
>
> Step 2. Raw material is transferred to the wash plant: There would be no changes to step 2; wet sand would continue to be moved from the raw material stockpile to the wash plant by a front-end loader.
>
> Step 3. Raw material is screened and washed at the wash plant: The processing screen in the wash plant would be replaced with a fully enclosed screen. Additionally, all wash plant conveyors would be replaced or retrofitted with covers.
>
> Step 4. Product sand is transferred to the product stockpile: Newly covered conveyors would transfer the washed sand to the product stockpile. Unlike existing conditions, the washed sand stockpile would now be stored in a new enclosed warehouse. The warehouse would be approximately 140 feet by 220 feet and 63 feet tall at its peak.[3] The outer walls and roof would consist of metal siding (26 gauge). Some translucent panels on the roof would allow natural light into the structure. In addition, fixtures for artificial lighting would be installed within the structure. The concrete footings that would support the warehouse would be embedded not more than 5 feet below surface grade. Approximately 400 cubic yards of concrete would be necessary for the footings. The anticipated soil cut volume for the foundation is approximately 300 cubic yards.
>
> Step 5. Product sand is transferred to customer trucks: All truck loadout activities involving the washed sand would occur within the enclosed warehouse. A revised onsite circulation pattern would be implemented. Trucks would continue to enter the site from the same location on Amador Street. Customers would receive sand within the warehouse and exit onto Amador Street, slightly south of the existing exit gate. A new wheel wash system would be installed at the exit from the stockpile and truck-loading enclosure. This area also would include a new truck-bed water spray system.

[3] Section 260(b)(2)(M) of the San Francisco Planning Code (Code) exempts from the height requirement all structures and equipment necessary for operation of industrial plants, and where structures and equipment do not contain separate floors, where permitted as principal or conditional uses by the Code.



PAVING LIMITS

UNDERGROUND CONVEYANCE

VALLEY GUTTERS/CHANNELS

PARCEL BOUNDARY

WAREHOUSE STRUCTURE

WATER CONTAINMENT AREA

RELOCATED OR EXTENDED STOCKPILES

EXISTING STOCKPILES

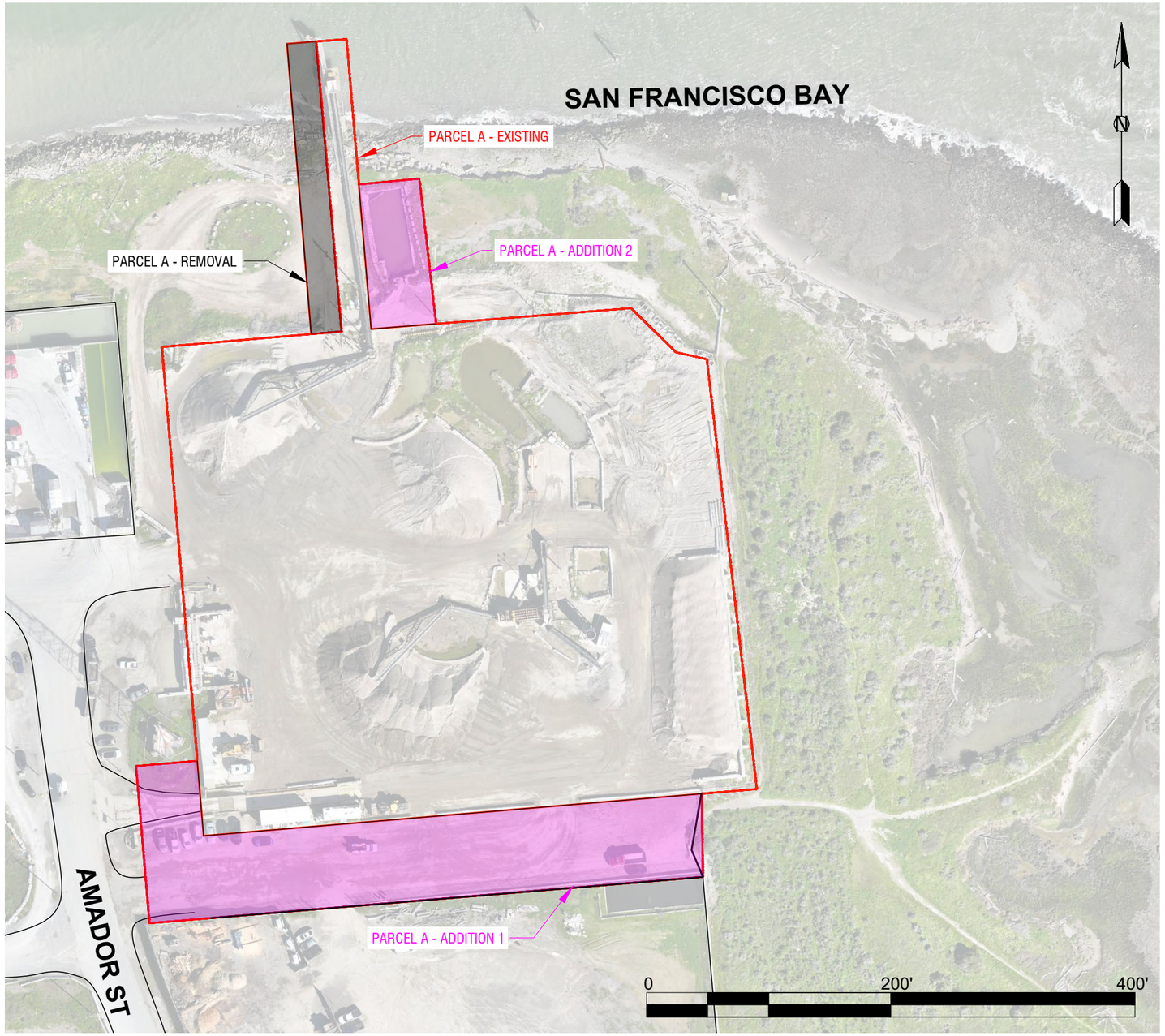
New Equipment	ID Tag
Feed Hopper Skid Mounted	FD211
Screen 1 1D5x16	SN211
Sand Screw 1	SS211
Dewatering Screen 1	DWS211
Dewatering Screen 2	DWS212
Screen Feed Conveyor 30"x 110'	CV201
Oversize Conveyor 30"x 50'	CV202
Building Feed Conveyor 30" x 110'	CV203
Building Conveyor 30" x 128'	CV204
Screw Recirculating Pump	PS211
Thickener Feed Pump	PS212
Cyclone Feed Pump	PS213
Thickener Mud Pump	PS214
Makeup Water Pump	PS211
Wheel Wash Pump 1	PS212
Wheel Wash Pump 2	PS213
Wheel Wash Drag Chain	TD211
Wheel Wash Water Sump	TK211
Flocc Dosing Pump	
Brandt Thickener	TH211
Underflow Density Meter	
Flocc Dosing Pump 1	
CAT Dosing Pump 2	

Source: Martin Marietta, 2025

Graphics - Martin_Marietta\105407_Pier_1_EIR (6.18.2025)

Pier 92 Modernization and Plant Replacement Project
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Figure 3
Proposed Project



EXISTING LEASE PARCEL A - 190,229 SQ FT

PROPOSED LEASE PARCEL A - 224,600 SQ FT

PARCEL A - LEASE AREA REMOVAL

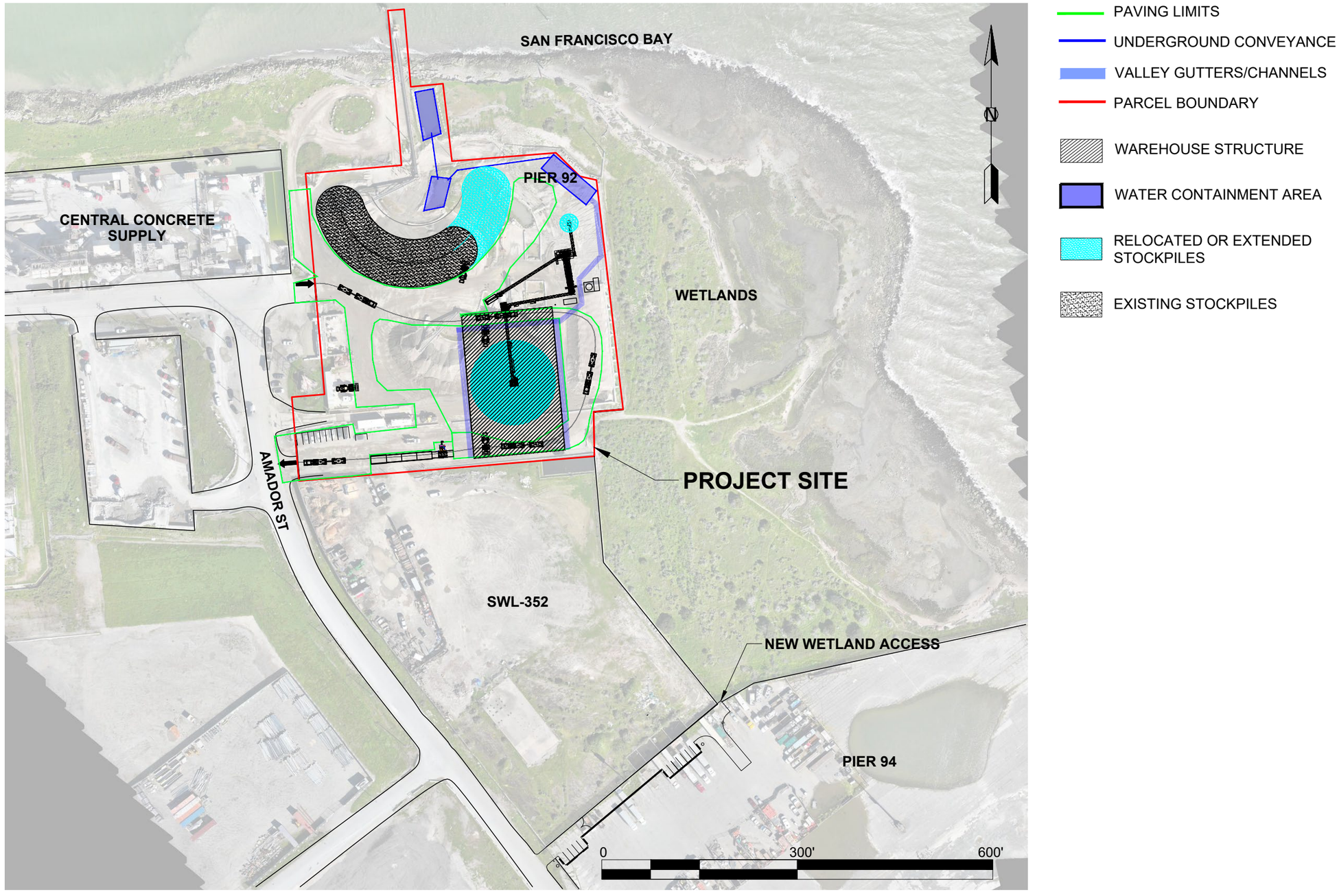
PARCEL A - LEASE AREA ADDITION

Source: Martin Marietta, 2025

Graphics: ...Martin_Marietta\105407_Pier_92_EIR (6-18-2025)

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Figure 4
Proposed Lease Parcel Changes

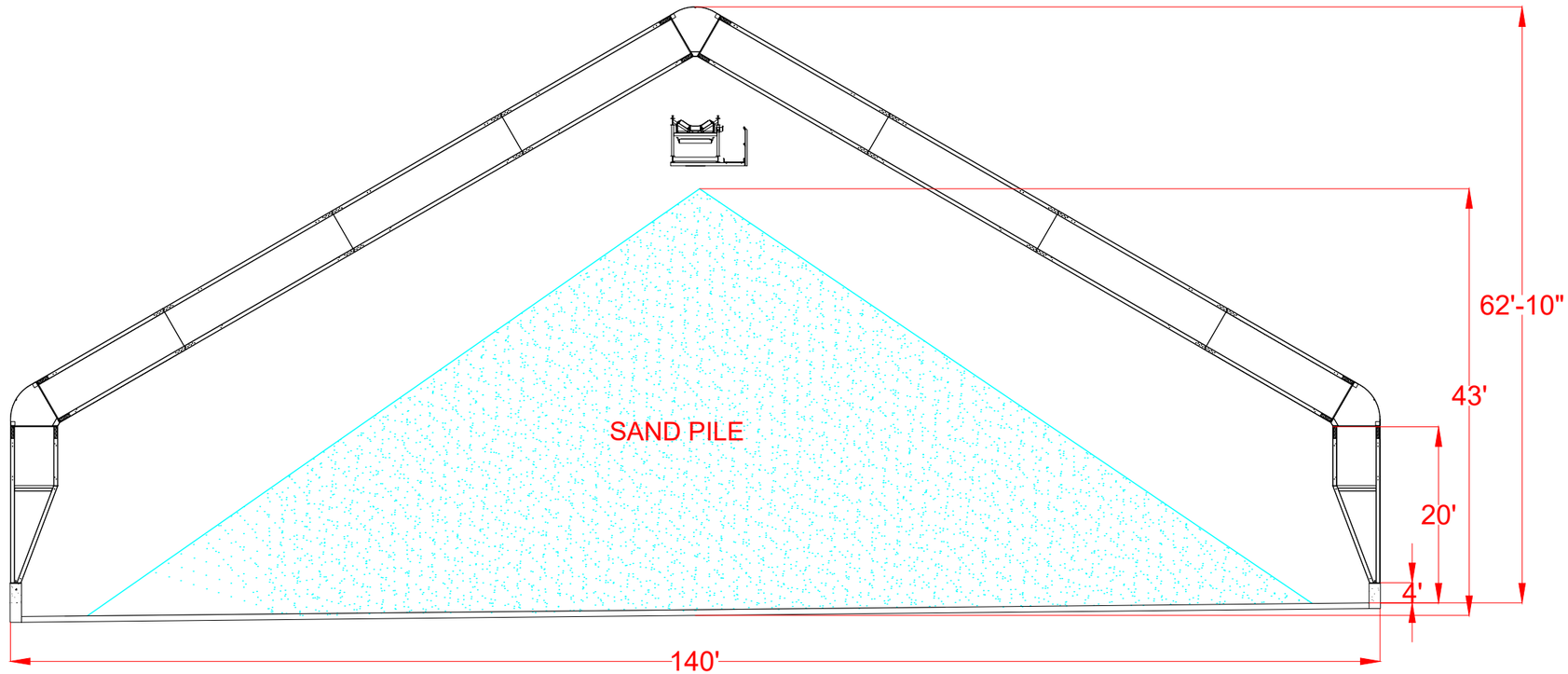


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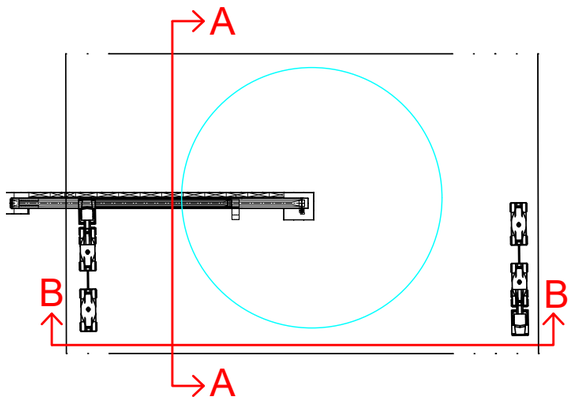
Pier 92 Modernization and Plant Replacement Project
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Figure 5
Wetland Easement



1 VIEW A-A - WAREHOUSE FRONT VIEW

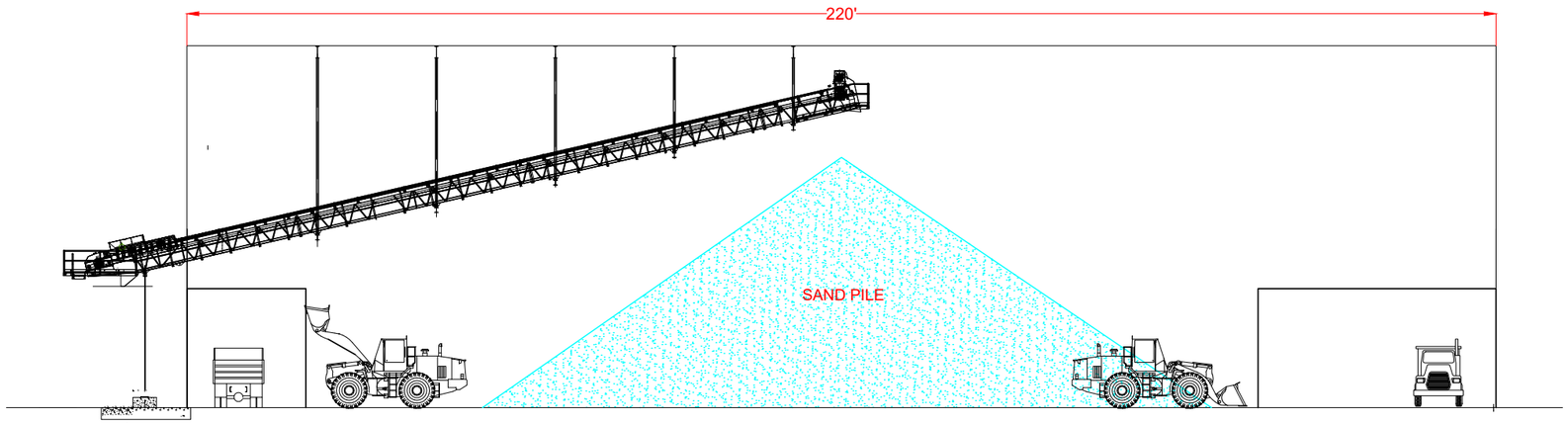
BUILDING PLAN VIEW KEY



Source: Martin Marietta, 2025

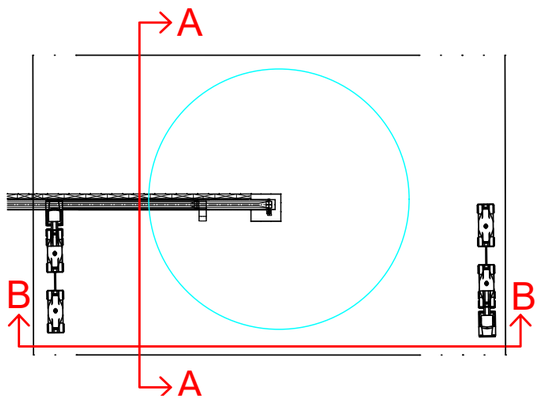
Graphics ... Martin_Marietta\105407_Pier_92_NOP (6-4-2025)

Figure 6
Storage Warehouse (front view)



2 VIEW B-B - WAREHOUSE SIDE VIEW

BUILDING PLAN VIEW KEY

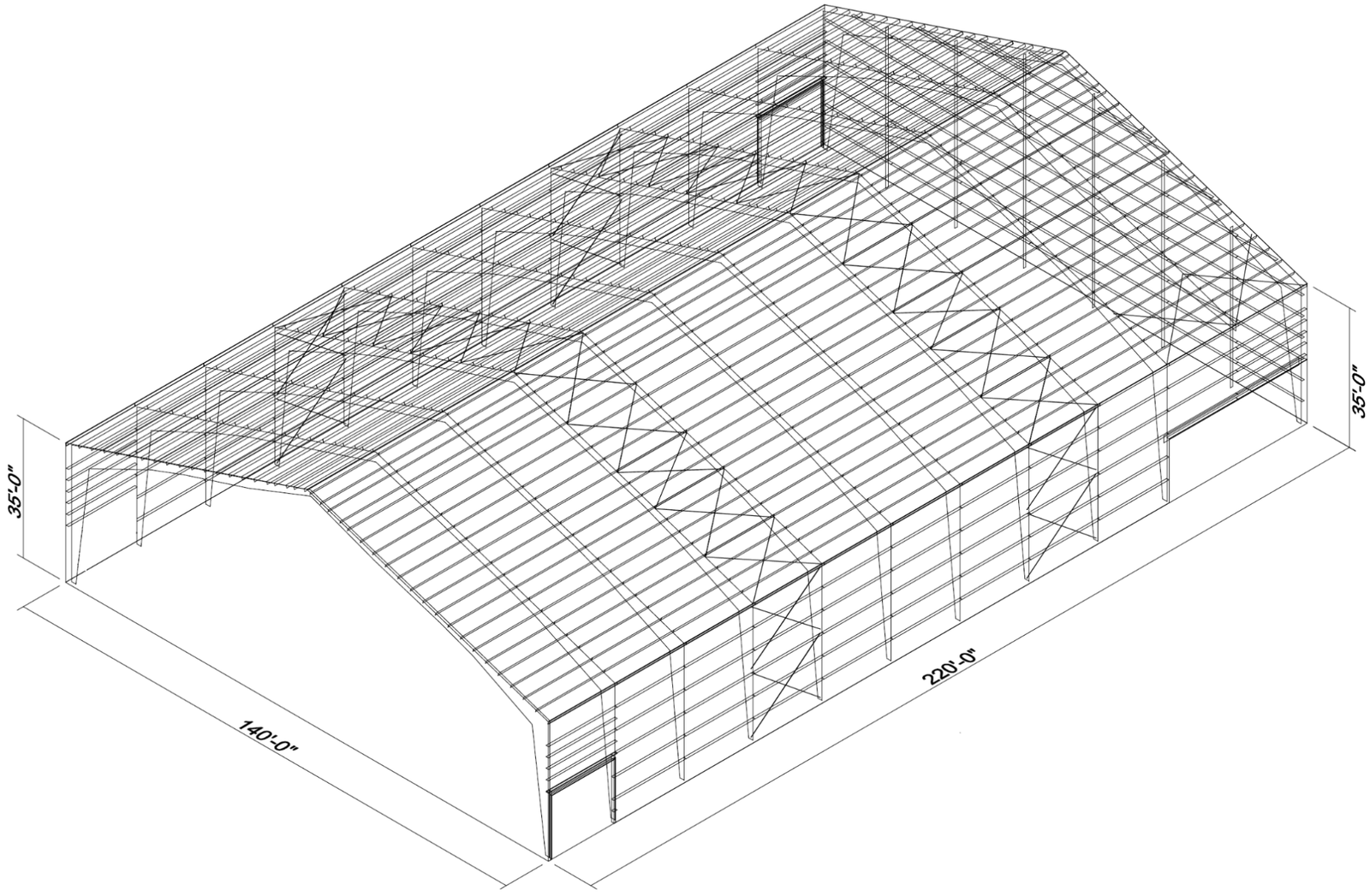


Source: Martin Marietta, 2025

Graphics ... Martin_Marietta\105407_Pier_92_NOP (6-4-2025)

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Figure 7
Storage Warehouse (side view)

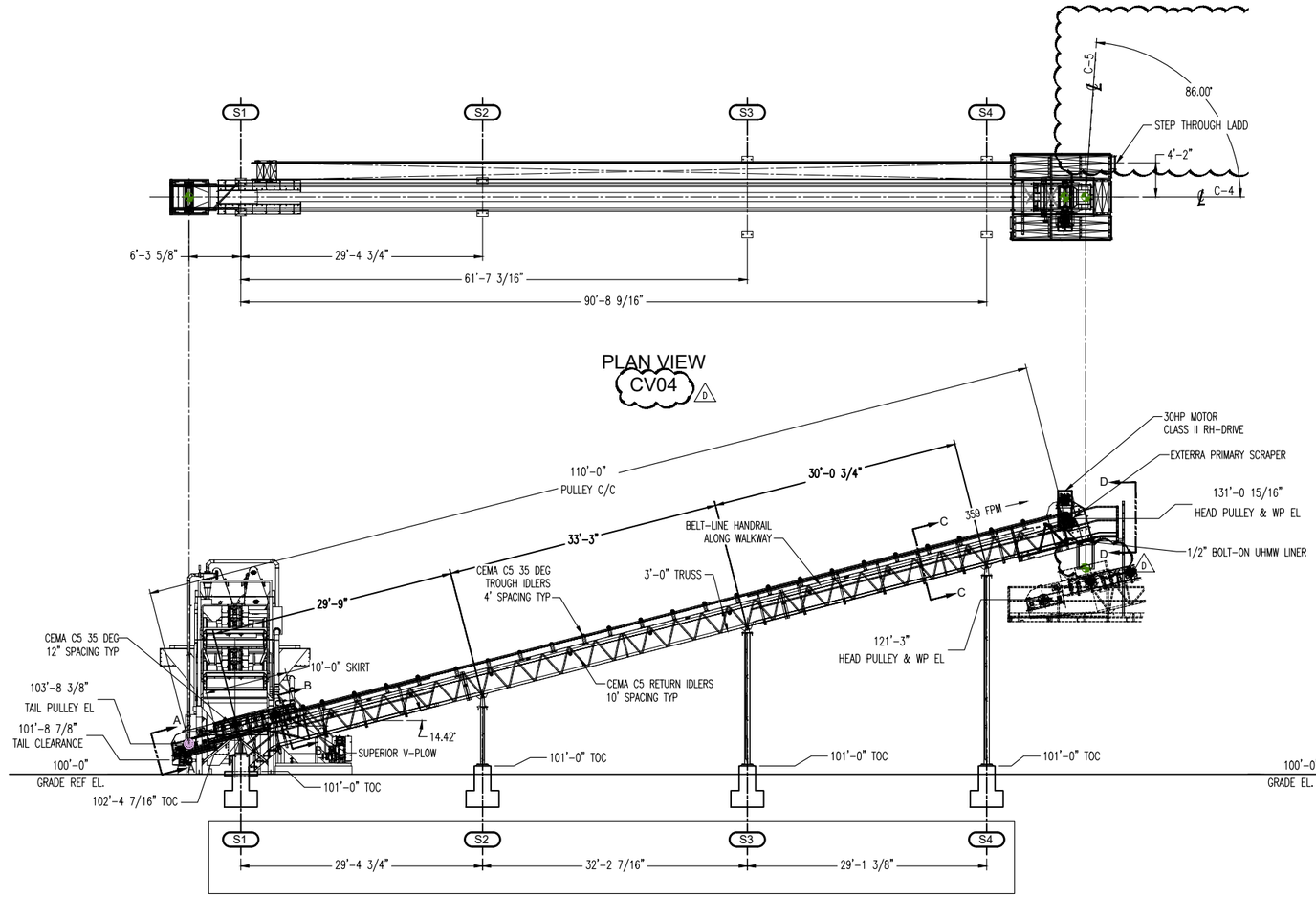


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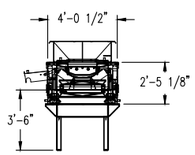
Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 8
Storage Warehouse

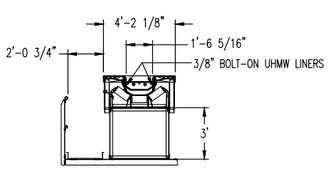


PLAN VIEW
CV04 D

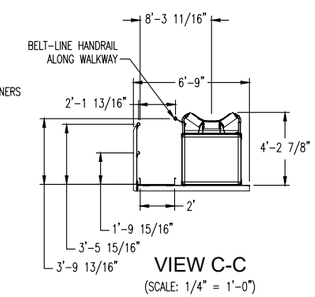
ELEVATION VIEW
PIER 92, SAN FRANCISCO, CA CV04 D



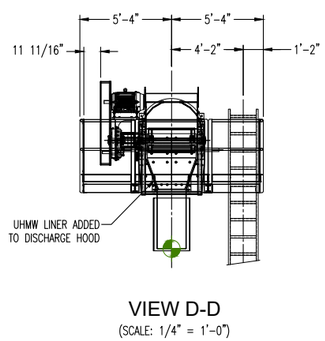
VIEW A-A
(SCALE: 1/4" = 1'-0")



VIEW B-B
(SCALE: 1/4" = 1'-0")

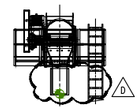


VIEW C-C
(SCALE: 1/4" = 1'-0")



VIEW D-D
(SCALE: 1/4" = 1'-0")

Source: Superior, 2025



C4-TO-C5 LADDER
ELEVATION VIEW

Conveyor Wind Covers—Typical/Planned

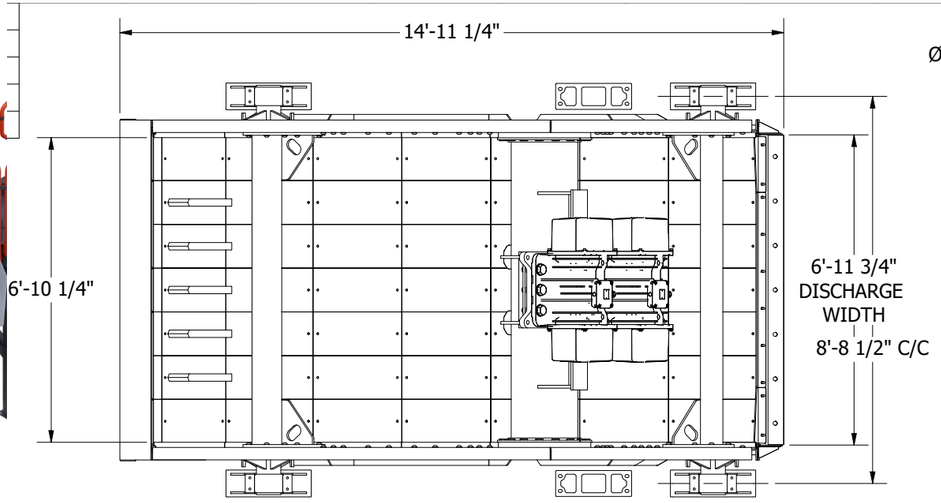


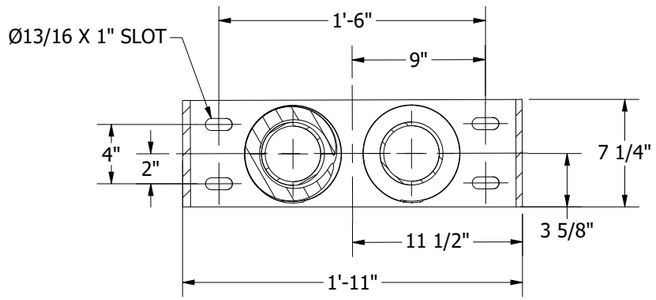
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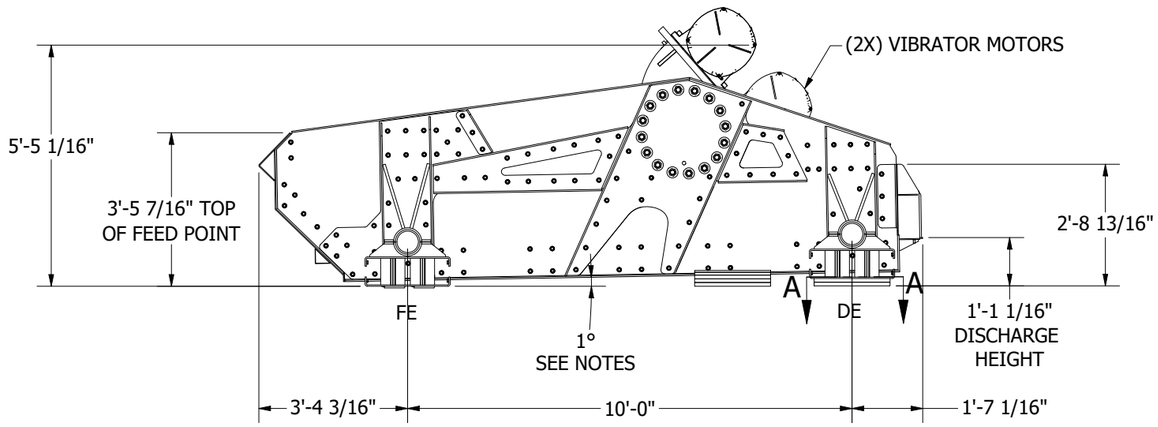
Figure 9
Truss Feed Conveyor (representative of all new covered conveyors)

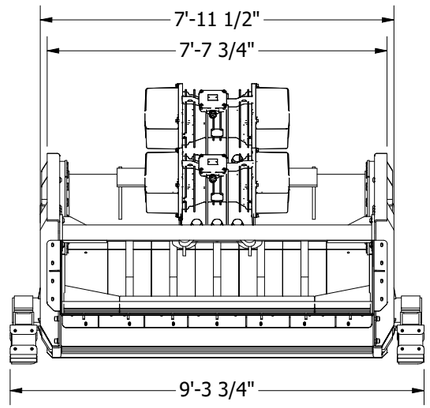






SPRING BASE PLATE DETAIL
SECTION A-A
SCALE 1 1/2"=1'







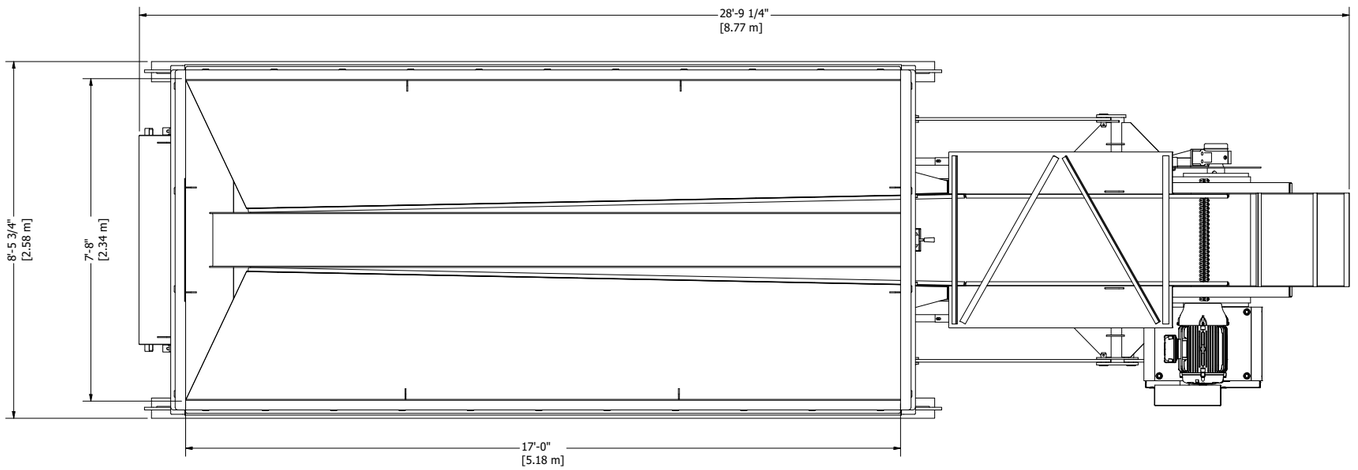
NOTE:

1. OPERATING ANGLE FROM 0°-3°. SHIMS INCLUDED TO ADJUST OPERATING ANGLE FROM 0°-2°. FACTORY RECOMMENDED OPERATING ANGLE AT 1°.
2. FE=FEED END, DE=DISCHARGE END
3. DL=DEAD LOAD, LL=LIVE LOAD

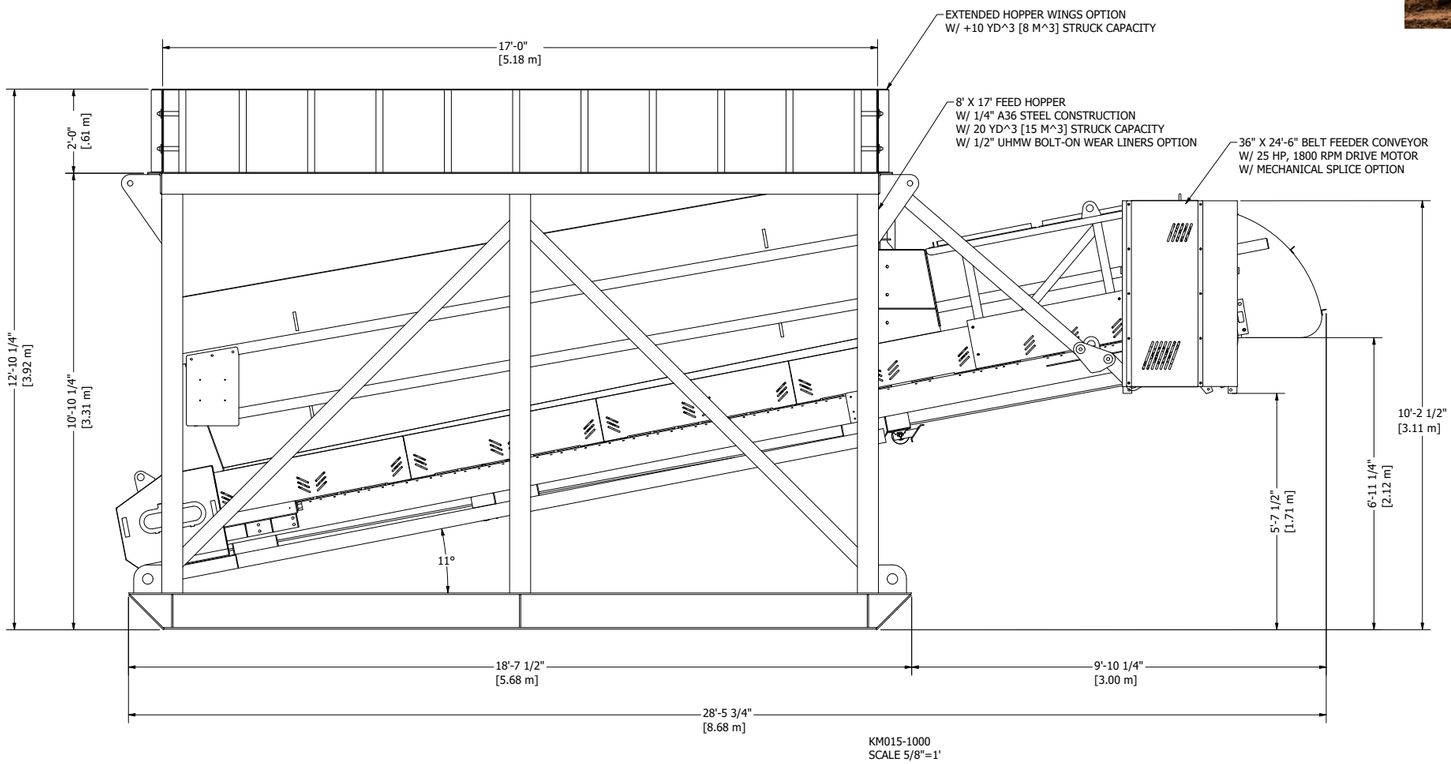
Source: Superior, 2025

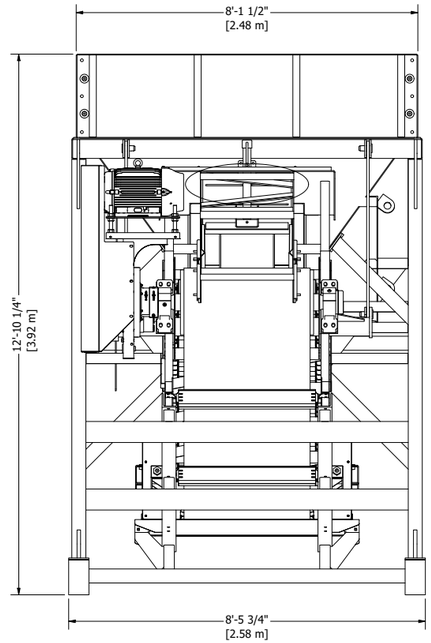
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Figure 10
Single-Deck Dewatering System







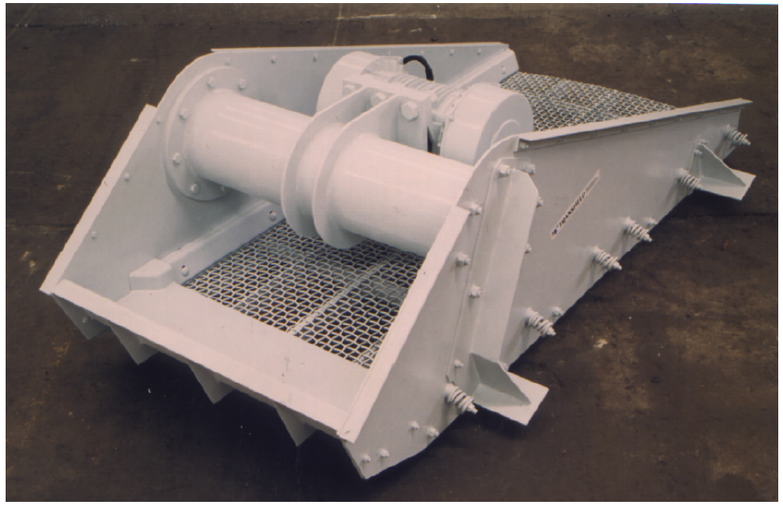


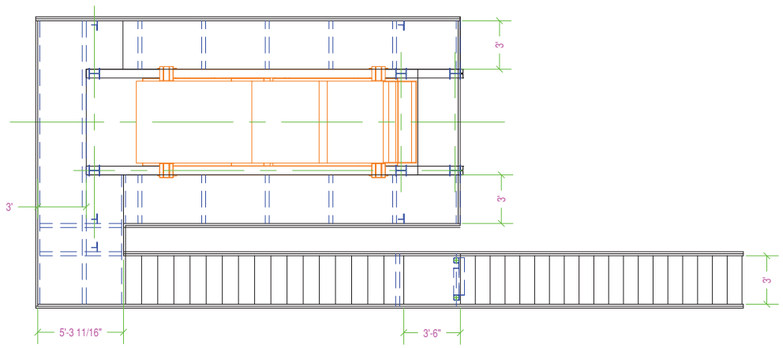
Source: Superior, 2024.

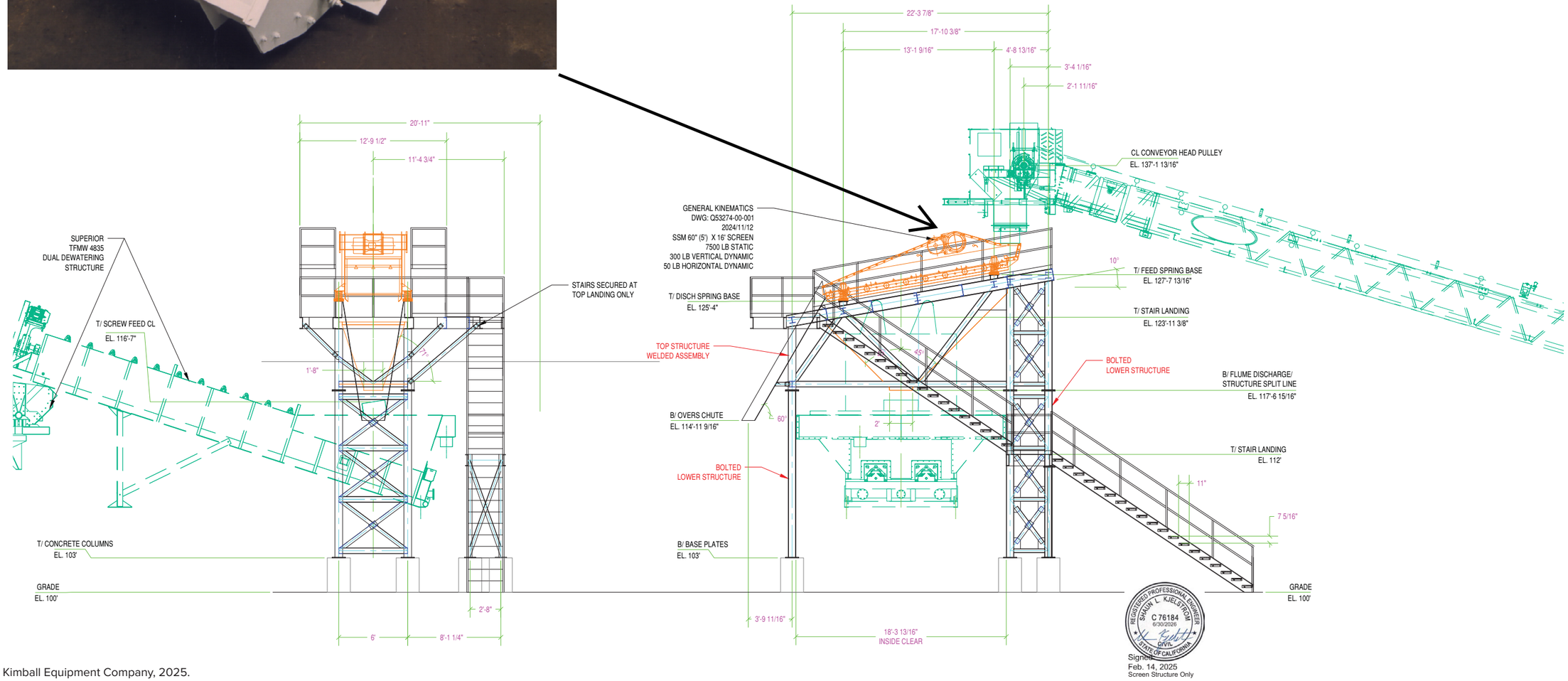
Graphics ... Martin_Marietta\105407_Pier_92_NOP (6-4-2025)

Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 11
Skid-Mounted Feed Hopper







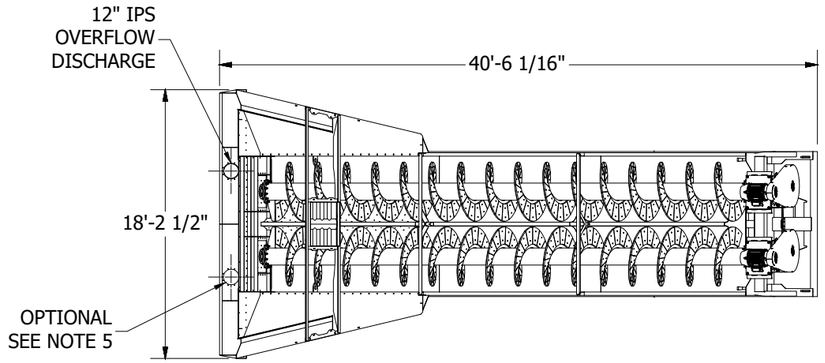
Source: © Kimball Equipment Company, 2025.

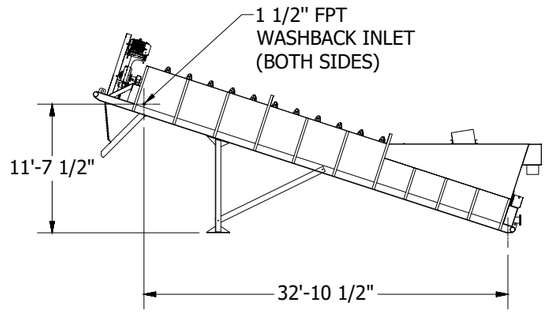
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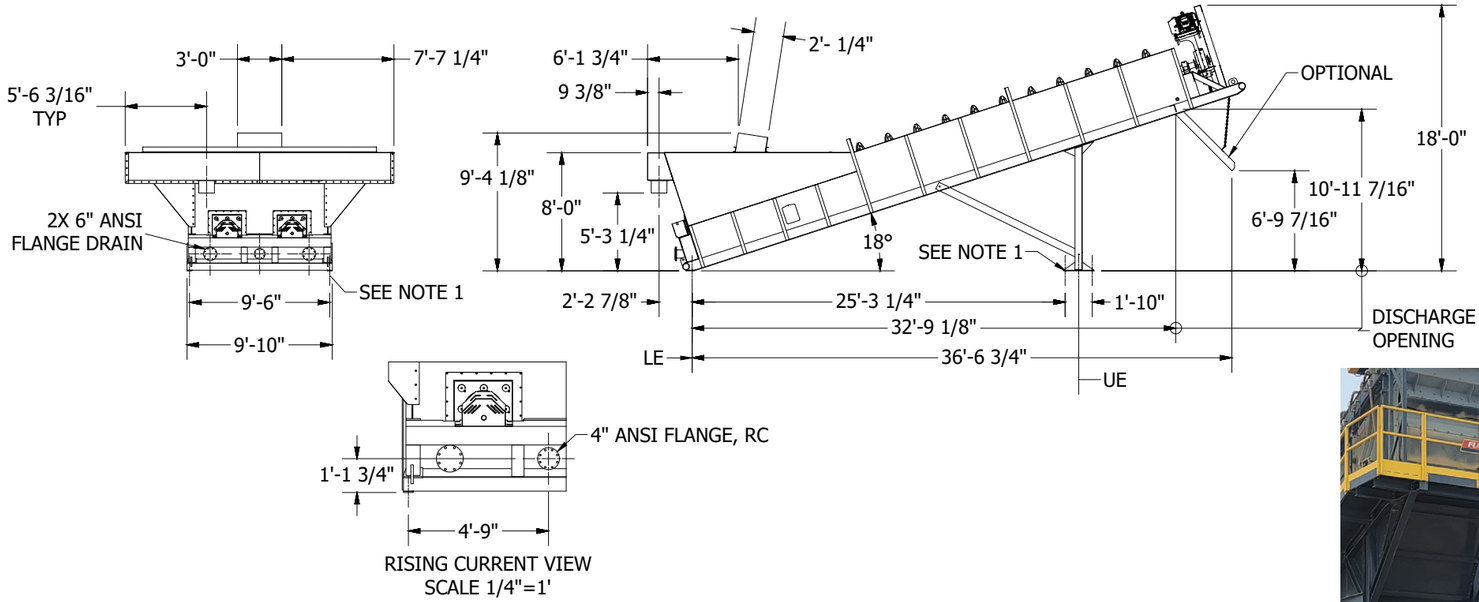
Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

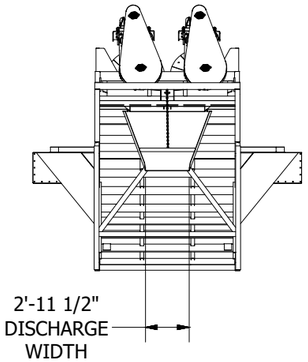
Figure 12
Single-Deck Wash Screen

LOAD TABLE (LBS)		
TYPE	LE	UE
DL	12,800	23,600
LL	61,400	18,800
OP	74,200	42,400











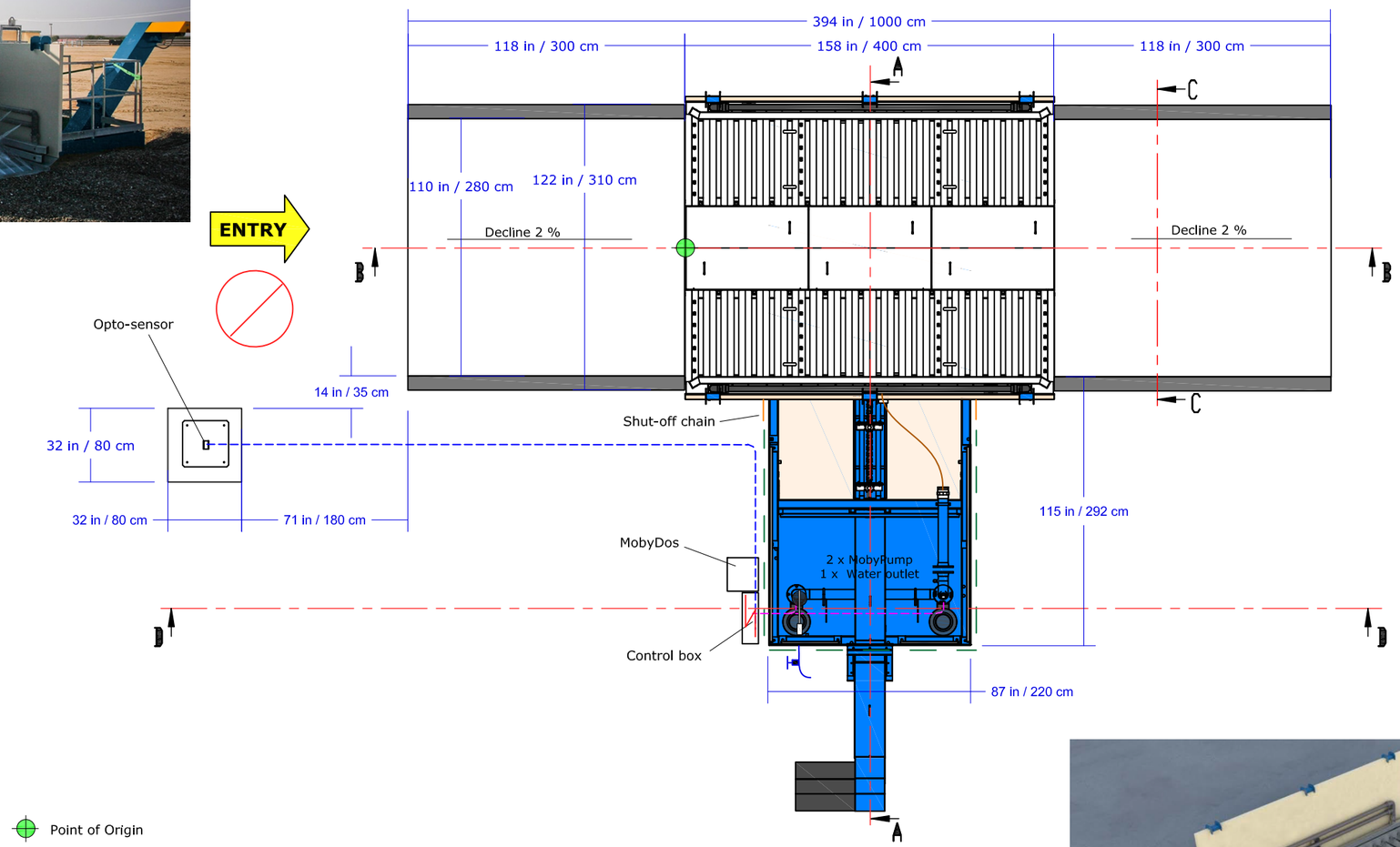
NOTES:
1. Ø 1-1/16" ANCHOR HOLES (6 LOCATION)
2. LE=LOWER END, UE=UPPER END
3. DL=DEAD LOAD, LL=LIVE LOAD, OP=OPERATING WEIGHT
4. RC=RISING CURRENT- 25 PSI MAXIMUM
5. BLANK FLANGE COVER INCLUDED, ADDITIONAL ~~DISCHARGE PIPE AVAILABLE UPON REQUEST~~

Source: Superior, 2023

Graphics ... Martin_Marietta\105407_Pier_92_NOP (6-4-2025)

Figure 13
Twin Fine-Material Washers Sand Screw





Point of Origin

FRUTIGER:	CUSTOMER:	
cable for pumps cable for sensor Heduflex hose Safety railing Shut-off chain	Water supply line (customer side): 3/4" internal thread Water pressure max. 4 bar (float valve inside the tank)	Empty conduit, PVC, min. 2", for sensor cable For permanent installation Concrete base (thickness 10 cm)
	Rated input power (customer side): P=15.4 hp (P=11.5 kW), connected load=30 A, 3 NPE, ~60 Hz, 460 V, TN-S / loose cable end with 2 m length above ground	
	The system must be earthed in accordance with local regulations. Either existing earthing points on the system can be used for this or additional ones must be set if required.	

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Graphics ... Martin_Marietta\105407_Pier_92_NOP (6-4-2025)

Figure 14
Wheel Wash System

Areas of the site where mobile equipment would operate, including front-end loaders and customers' trucks, would be paved. Approximately 60,000 square feet of the site would be paved with asphalt over 12 inches of base rock (Class 2 base). Paving would disturb approximately 2,200 cubic yards of soil. Excess soil yardage would be spread onsite and regraded in conjunction with implementation of a new onsite drainage system (see Figure 15, p. 23). During construction, any soil that is identified as contaminated and cannot be reused will be removed from the site in compliance with existing federal, state and local regulations. The 10 existing employee/visitor parking spaces (3,330 square feet) would be paved as well. The facility would continue to contract for street sweeping services of paved areas for four hours per day, from 7 a.m. to 11 a.m. Monday through Friday, and as needed on Saturdays. No changes to Amador Street access or curbs are proposed.

A modern stormwater management system also would be installed. The current system includes settling basins that are connected to an existing authorized discharge pond (EFF-001) by an underground pipe. The pond discharges into the Bay under a National Pollutant Discharge Elimination System (NPDES) permit (No. CAG982001, Order No. R2-2020-0028). The proposed drainage pattern would remain similar to the existing pattern and use drainage channels, valley gutters, and underground conveyance to direct flows to the discharge pond. No utility upgrades are anticipated for the project.

Project construction is estimated to last up to seven months and require use of a man lift, crane, forklift, paver, water truck, Bobcat, sheepsfoot compactor, vibratory drum roller, and motor grader. In total, the project would require approximately 3,305 cubic yards of excavation.

Required Project Approvals

The following is a preliminary list of required approvals for the proposed project and is subject to change. These approvals may be considered by decision-makers in conjunction with the required environmental review, but final determination on the required approvals may not be reached until completion of the environmental review.

Local Agencies

Actions by the San Francisco Planning Commission

- Certification of an EIR and adoption of findings under CEQA
- Adoption of Findings of Consistency with the San Francisco General Plan and Priority Policies of Planning Code Section 101.1

Actions by the San Francisco Port or Port Commission

- Approval of proposed new lease
- Issuance of a building permit

Actions by San Francisco Bay Conservation and Development Commission (BCDC)

- Approval of permit for proposed improvements within BCDC jurisdiction, if any.

Actions by the Bay Area Air Quality Management District

- Authority to Construct and Permit to Operate for each source at the facility that requires a permit under Air District regulations

Actions by the San Francisco Bay Regional Water Quality Control Board

- Update to the existing National Pollutant Discharge Elimination System (NPDES) permit

Summary of Potential Environmental Issues

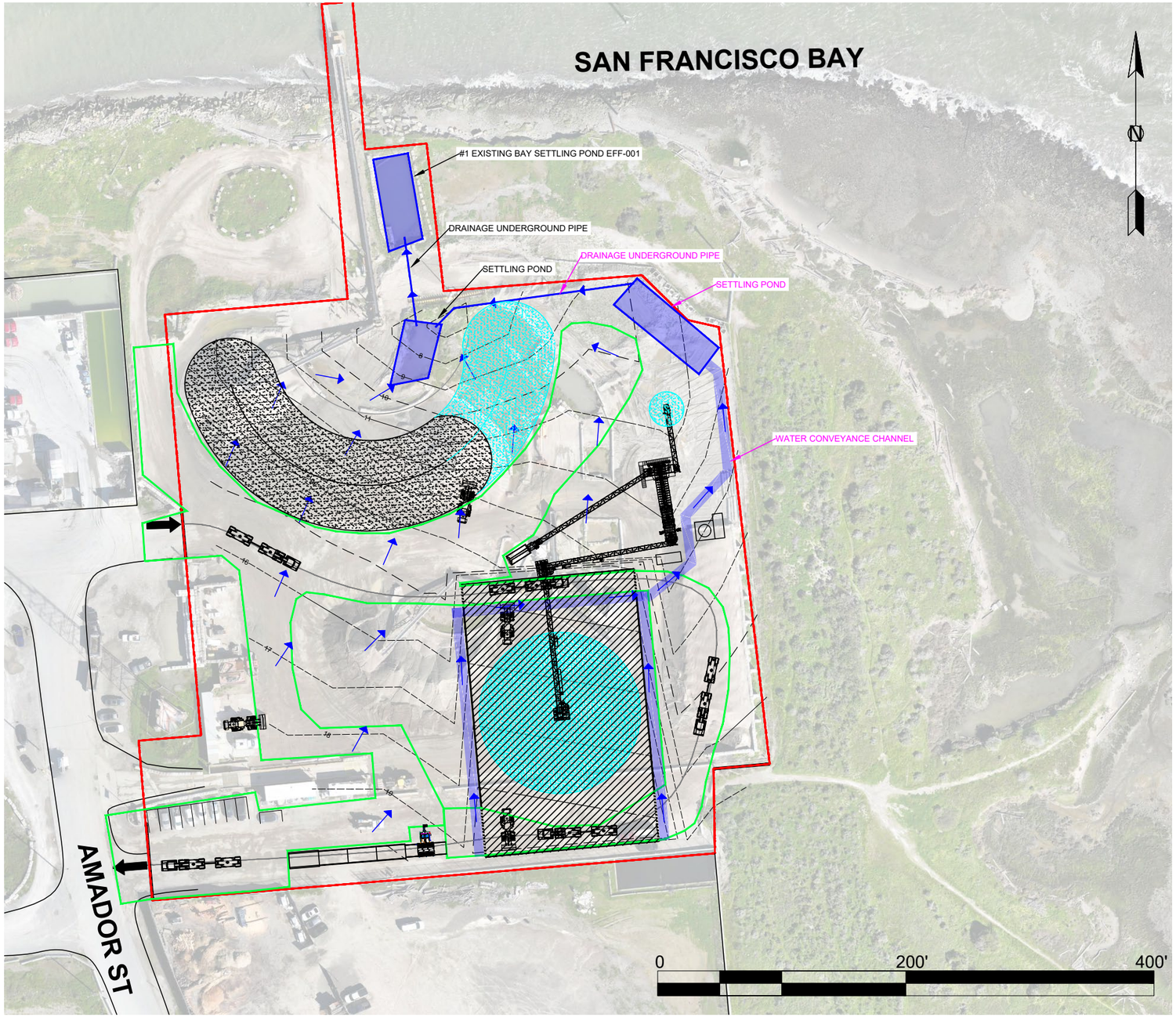
The proposed project could result in potentially significant environmental effects. Therefore, the department will prepare an initial study and EIR to evaluate the physical environmental effects of the proposed project. The initial study will assess both project-specific and cumulative impacts for all topics in the department's initial study checklist and will identify which topics may show significant environmental impacts caused by the proposed project. The initial study will be published as an appendix to the draft EIR and will be part of the EIR.

As required by CEQA, the EIR will further examine those issues identified in the initial study as having potentially significant effects, identify mitigation measures, analyze whether the proposed mitigation measures would reduce the environmental effects to less-than-significant levels, and identify feasible alternatives to the proposed project that would reduce those impacts.

The EIR (including the initial study) will be prepared in compliance with CEQA (California Public Resources Code Sections 21000 et seq.), the State CEQA Guidelines, and Chapter 31 of the San Francisco Administrative Code. The EIR is an informational document for use by governmental agencies and the public to aid in the planning and decision-making process. The EIR will disclose any physical environmental effects of the proposed project and identify possible ways of reducing or avoiding potentially significant impacts.

The EIR will evaluate the environmental impacts of the proposed project resulting from construction and operational activities and propose mitigation measures to reduce or avoid impacts determined to be significant. The EIR will also discuss other topics required by CEQA, including significant unavoidable impacts and significant irreversible impacts, as well as known controversy associated with the project and its environmental effects and issues to be resolved by decision-makers. The EIR will also identify potential cumulative impacts that consider impacts of the proposed project in combination with impacts of other past, present, and reasonably foreseeable future projects. The EIR (including the initial study) will address all environmental topics in the department's CEQA environmental checklist; at this time, topics marked with an underline and asterisk (*) are anticipated to be included for full analysis in the EIR:

- Land Use and Planning
- Aesthetics
- Population and Housing
- Cultural Resources
- Tribal Cultural Resources
- Transportation and Circulation
- Noise
- Air Quality*
- Greenhouse Gas Emissions
- Wind
- Shadow
- Recreation
- Utilities and Service Systems
- Public Services
- Biological Resources
- Geology and Soils
- Hydrology and Water Quality
- Hazards and Hazardous Materials
- Mineral Resources
- Energy
- Agriculture and Forestry Resources
- Wildfire



Source: Martin Marietta, 2025

Graphics_ Martin_Marietta\105407_Pier_92_EIR (6.18.2025)

Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 15
Site Drainage Plan (preliminary)

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Finding

This project may have a significant effect on the environment; therefore, an EIR will be prepared. This determination is based on the criteria of the State CEQA Guidelines Sections 15063 (Initial Study), 15064 (Determining Significant Effect), and 15065 (Mandatory Findings of Significance). The purpose of the EIR is to provide information about potential significant physical environmental impacts of the proposed project and identify possible ways to minimize any significant impacts. The EIR also describes and analyzes possible alternatives to the proposed project.

Preparation of an NOP or EIR does not indicate a decision by the City and County of San Francisco to approve or disapprove a proposed project. However, prior to making any such decision, the decision-makers must review and consider the information contained in the EIR.

Public Scoping Comments

The department welcomes your comments concerning potential environmental effects of this project. Written comments will be accepted until **5:00 p.m. on August 1, 2025**. Written comments should be sent to Jennifer McKellar, San Francisco Planning Department, 49 South Van Ness Avenue, Suite 1400, San Francisco, CA 94103, or emailed to CPC.Pier92EIR@sfgov.org, and should reference the project title and case number on the front of this notice.

Pursuant to California Public Resources Code Section 21083.9 and State CEQA Guidelines Section 15206, the department will also hold a public scoping meeting to solicit public comments concerning the scope of the EIR. The meeting will be held on July 16, 2025, starting at 6:00 p.m. at the Southeast Community Center, 1550 Evans Avenue. To request a language interpreter or to accommodate persons with disabilities at the scoping meeting, please contact Jennifer McKellar, (628) 652-7563, at least 72 hours in advance of the meeting.

State Agencies: If you work for a responsible state agency, we need to know the views of your agency regarding the scope and content of the environmental information that are germane to your agency's statutory responsibilities in connection with the proposed project. Your agency may need to use the EIR when considering a permit or other approval for this project. Please include the name of a contact person in your agency. If you have questions concerning the environmental review of the proposed project, please contact Jennifer McKellar at (628) 652-7563 or CPC.Pier92EIR@sfgov.org.

Members of the public are not required to provide personal identifying information when they communicate with the planning commission or the department. All written or verbal communications, including submitted personal contact information, may be made available to the public for inspection and copying on request, and may appear on the department's website or in other public documents.

Recipients of this notice are encouraged to pass on this information to others who may have an interest in the project.



July 2, 2025

By Lisa Gibson
Environmental Review Officer

Date

Cc: Shamann Walton, District 10 Supervisor

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APPENDIX B

INITIAL STUDY

PIER 92 MODERNIZATION AND PLANT REPLACEMENT PROJECT INITIAL STUDY

Planning Department Case No. 2024-005922ENV

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A. Project Description

The proposed project description is included in Chapter 2, Project Description and Site Context, of the draft environmental impact report (EIR) to which this initial study is appended.

B. Project Setting

The project setting for the proposed project is included in Section 2.C, Project Location and Site Characteristics, of the draft EIR to which this initial study is appended.

C. Compatibility with Existing Zoning and Plans

	Applicable	Not Applicable
Discuss any variances, special authorizations, or changes proposed to the planning code or zoning map, if applicable.	☐	☒
Discuss any conflicts with any adopted plans and goals of the City or region, if applicable.	☒	☐
Discuss any approvals and/or permits from city departments other than the planning department or the Department of Building Inspection, or from regional, state, or federal agencies.	☒	☐

This chapter provides a summary of the plans and policies of the City and County of San Francisco (City) as well as regional and state agencies that have policy and regulatory control over the project site.

C.1. San Francisco Planning Code and Zoning Maps

The San Francisco Planning Code, which incorporates by reference the City's zoning maps, governs permitted uses, densities, and the configuration of buildings within San Francisco.

LAND USE

The project site is within the M-2 (Heavy Industrial Use) District and 40 X Height and Bulk District. Specifically, the project site is adjacent to Islais Creek Channel within the Piers 80–96 Maritime Eco-Industrial Center. The M-2 District serves activities like chemical manufacturing, mining, and power production (Planning Code section 210.4). Within the M-2 District, sand processing services are permitted. The proposed project would also require a building permit issued by the Port of San Francisco (Port).

HEIGHT AND BULK

The project site is in the 40 X Height and Bulk District, which limits the maximum allowable height on the site to 40 feet, with exceptions for certain rooftop projections such as mechanical equipment and screening; there is no bulk limit. Planning Code section 260(b)(2)(M) exempts from the height requirement all structures and equipment necessary for operation of industrial plants where the structures and equipment do not contain separate floors permitted as principal or conditional uses by the code. The project proposes a new storage warehouse that would be approximately 140 feet by 220 feet and 63 feet tall at its peak. The new storage warehouse would be exempt from the 40-foot height requirement because, pursuant to section 260(b)(2)(M), it would be necessary for the plant's operations and would not contain separate floors.

PARKING AND LOADING

Under Planning Code section 151, there are no requirements for non-residential off-street parking and no maximums. The project would pave 10 currently unpaved parking spaces on the project site for continued future use. Although Planning Code sections 151.1, 152.1, and 153.1 contain off-street parking space, loading space, and bike parking (Class 1 and 2 facilities) requirements, because the proposed project does not propose any new occupied floor area within structures (other than the warehouse, which would cover sand), there is no floor area to calculate for these requirements.

FLOOR AREA RATIO

Floor area ratio (FAR) is the ratio of the gross floor area of all buildings on a lot to the area of the lot. The M-2 District has a basic set FAR of 5.0 to 1 (Planning Code section 124 and 210.4). By constructing a 30,800-square-foot warehouse on the 224,600-square-foot project site (34,370 square feet larger than the existing site), the proposed project would have a FAR of 7.3 to 1, which is within the scope of development for the M-2 District.

C.2. Plans and Policies

SAN FRANCISCO GENERAL PLAN

The general plan establishes objectives and policies to guide land use decisions related to the physical development of San Francisco. It is comprised of 10 elements, each of which addresses a particular topic that applies citywide: air quality; arts; commerce and industry; community facilities; community safety; environmental protection; housing; recreation and open space; transportation; and urban design. Any conflict between the proposed project and policies that relate to physical environmental issues are discussed in Section E, Evaluation of Environmental Effects. The project consists of reconstruction and modernization of the existing sand processing facility on the Port's Pier 92. The proposed project would install and operate a new sand processing system with new equipment, enhanced environmental controls, and other site upgrades; a key element of the project modernization is the installation of enhanced dust control measures. It would not introduce incompatible land uses to the neighborhood. The project would not otherwise conflict with any general plan policies or objectives. Thus, the project would not be inconsistent with the San Francisco General Plan.

WATERFRONT PLAN

The project site is within the southern waterfront area of the Port's Waterfront Plan, which was originally adopted in 1997. The Waterfront Plan update, approved by the Port Commission in 2023, includes new policies for racial and social equity as well as climate change resilience and sustainability that align with the Port's Racial Equity Action Plan and Waterfront Resilience Program. The Waterfront Plan describes the Port's long-term goals and policies to guide the use and improvement of its piers and properties, from Fisherman's Wharf to India Basin/Bayview. The plan's policies are used to shape the character and benefits of waterfront development and improvement projects and ensure community engagement. The Waterfront Plan provides a long-range policy framework to guide future Port improvement projects, programs, and stewardship initiatives.

The Waterfront Plan includes the following maritime policies relevant to the project site from the 1997 and 2023 plan:

- Protecting maritime facilities, infrastructure, and operational flexibility (Policies 1–6);
- Maintaining and enhancing maritime facilities by providing long-term leases and other incentives for maritime industries and encouraging the development of new commercial and recreation-oriented maritime activities (Policies 7, 8);
- Maintaining existing marine terminals at Pier 80, Pier 92, and Piers 94–96 for non-container cargo shipping activities (Policy 14);
- Maximizing efficient use of new and existing parking facilities in a manner that doesn't hamper maritime business operations or public access (Policy 18);
- Pursuing industrial leasing and warehouse development in Piers 90–94 backlands and industrial transportation access to protect the integrity of the Port's southern waterfront cargo terminal operations (Policies 15, 16, 17); and
- Enhancing the Piers 80–96 Maritime Eco-industrial district to allow industrial development while incorporating environmental improvements in the southern waterfront (Policy 3).

The following environmental policies from the Waterfront Plan also apply to the project site:

- Reducing greenhouse gas emissions and maximizing carbon capture and sequestration, with consideration of incentives for carbon emissions reduction measures and improved energy efficiency (Policies 1a–1d);
- Improving water quality through remediation of contaminated sites, repairing and constructing new wastewater infrastructure, ensuring continued stormwater management and new green infrastructure to reduce sewage overflows, removing harmful bay fill, and building partnerships and promoting education and awareness to improve water quality (Policies 2a–2f);
- Implementing water conservation measures, including new infrastructure (Policies 3a–3b);
- Protecting and enhancing biodiversity (e.g., through bird-safe building designs); promoting native plants in landscaping, parks, and open spaces; and developing natural and multi-benefit green infrastructure (Policies 4a–4h);
- Implementing the Port's green building code in Port lease and development projects, including conformance with Leadership in Energy and Environmental Design (LEED) standards, energy efficiency standards, zero waste practices, and the City's Better Roofs Ordinance, and promoting district-level sustainability measures (Policies 5a–5g); and
- Reducing environmental health risks from Port operations (Policy 6).

The proposed project consists of the reconstruction and modernization of an existing sand processing facility on Pier 92. The continued operation of the facility with new equipment, enhanced environmental controls, and other site upgrades would not conflict with the policies of the Waterfront Plan. In addition, the new storage warehouse would be constructed in accordance with Port building codes and applicable sections of the San Francisco Planning Code, including section 139, Standards for Bird-Safe Buildings (which has been incorporated into the Port's green building code).

PORT OF SAN FRANCISCO PIER 80–96 MARITIME ECO-INDUSTRIAL CENTER STRATEGIC PLAN

The project site is within the Port of San Francisco Piers 80–96 Maritime Eco-Industrial Center (Maritime Eco-Industrial Center), on piers and upland properties within the Port's Southern Waterfront area. The Port defines the Maritime Eco-Industrial Center as an area that co-locates maritime industrial uses to enable product exchange, optimizes the use of resources, incorporates green designs and green technologies onsite, fosters resource recovery and reuse, provides economic opportunities that employ local residents, minimizes environmental impacts, and incorporates public open space for enjoyment and habitat. One of the goals that guides implementation of the strategic plan is to provide public realm and open space improvements and complete the Blue Greenway projects. In addition, the strategic plan promotes the restoration and enhancement of wetland habitat. The project site is identified as Pier 92 for sand import/processing. The continued operation of the facility with new equipment, enhanced environmental controls, and other site upgrades would not conflict with the policies of the Strategic Plan.

OTHER LOCAL PLANS AND POLICIES

Other local plans and policies that are relevant to the proposed project are outlined below:

- San Francisco Better Streets Plan was adopted in 2010 to support the City's efforts to enhance the streetscape and the pedestrian environment and consists of two components: the Streetscape Master Plan and the Pedestrian Transportation Master Plan. The Better Streets Plan classifies the City's public streets and rights-of-way and creates a unified set of standards, guidelines, and implementation strategies that govern how the City designs, builds, and maintains its public streets and rights-of-way. The project would not conflict with the Better Streets Plan.
- San Francisco Climate Action Plan (updated in 2026) is a local action plan that examines the causes of global climate change and the human activities that contribute to global warming; provides projections of climate change impacts on California and San Francisco based on recent scientific reports; presents estimates of San Francisco's baseline greenhouse gas emissions inventory and reduction targets; and describes recommended actions for reducing the City's GHG emissions. The project would not conflict with the Climate Action Plan.
- Vision Zero SF was adopted in 2014 to support the City's efforts to eliminate all traffic deaths in San Francisco by the year 2024. The goal of Vision Zero SF is also to reduce severe injury inequities across neighborhoods, transportation modes, and populations and to build better and safer streets, educate the public on traffic safety, enforce traffic laws, and adopt policy changes that save lives. The project would not conflict with Vision Zero SF.
- San Francisco Bay Area Seaport Plan (Seaport Plan) (published in 2023) is a joint regional policy document of the Bay Conservation and Development Commission (BCDC) and the Metropolitan Transportation Commission (MTC). The Seaport Plan, which constitutes the maritime element of MTC's regional transportation plan, is incorporated into BCDC's Bay Plan and the basis for port-related Bay Plan policies. The overarching purpose of the plan is to enhance economic activity while protecting the environment, making efficient use of all resources, and coordinating development. The plan designates several ports on San Francisco Bay as priority use areas, which are reserved for regional maritime use. The project site is in the Pier 92–96 Cargo Terminals priority use area. The project would not conflict with the Seaport Plan.

REGIONAL PLANS AND POLICIES

The four principal regional planning agencies, with their overarching policies and plans noted in parentheses, that guide planning in the nine-county Bay Area are the Bay Area Quality Management Air District (Air District) (2017 Bay Area Clean Air Plan), the Association of Bay Area Governments and the Metropolitan Transportation Commission (MTC) (Plan Bay Area 2050), MTC (2035 Regional Transportation Plan), the San Francisco Regional Water Quality Control Board (San Francisco Basin Plan), and the San Francisco Bay Conservation and Development Commission (San Francisco Bay Plan). Due to its location, size, and purpose (i.e., the reconstruction and modernization of an existing sand processing facility), the proposed project is not anticipated to be inconsistent with regional plans and policies. However, the proposed project could generate emissions related to increased activity, including an increase in the number of trucks on local/regional roadways.

In April 2017, the Air District adopted the 2017 Bay Area Clean Air Plan (2017 Clean Air Plan), which requires implementation of "all feasible measures" to reduce ozone; provides a control strategy to reduce ozone, particulate matter, toxic air contaminants, and greenhouse gas emissions in a single, integrated plan; reviews progress toward improving air quality in recent years; and eliminates health risk disparities from exposure to air pollution among Bay Area communities. The 2017 Clean Air Plan and the physical environmental impacts of the proposed project related to attainment of air quality standards are addressed in draft EIR Section 3.C, Air Quality.

D. Summary of Environmental Effects

The project could potentially result in adverse physical effects on the environmental resources checked below, and where those impacts are significant or potentially significant, the California Environmental Quality Act (CEQA) requires identification of mitigation measures to reduce the severity of the impacts to a less-than-significant level to the extent feasible. This initial study presents a more-detailed checklist and discussion of each environmental resource, unless otherwise noted below.

- ☐ Land Use and Planning
- ☐ Aesthetics
- ☐ Population and Housing
- ☒ Cultural Resources
- ☒ Tribal Cultural Resources
- ☐ Transportation and Circulation
- ☐ Noise
- ☒ Air Quality
- ☐ Greenhouse Gas Emissions
- ☐ Wind
- ☐ Shadow
- ☐ Recreation
- ☐ Utilities and Service Systems
- ☐ Public Services
- ☐ Biological Resources
- ☐ Geology and Soils
- ☐ Hydrology and Water Quality
- ☐ Hazards and Hazardous Materials
- ☐ Mineral Resources
- ☐ Energy
- ☐ Agriculture and Forestry Resources
- ☐ Wildfire
- ☒ Mandatory Findings of Significance

This initial study evaluates the potential for the project to result in significant environmental impacts and identifies which environmental resource topics are appropriately analyzed in the initial study and those that warrant more-detailed analysis in the draft EIR.

On the basis of this initial study, the resource topic for which there is a potential for impacts to be significant or for which the analysis requires additional detail is air quality, which is analyzed in the draft EIR.

E. Evaluation of Environmental Effects

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
1. LAND USE AND PLANNING. Would the project:					
a) Physically divide an established community?	☐	☐	☒	☐	☐
b) Cause a significant physical environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact LU-1: The proposed project would not physically divide an established community. *(Less than Significant)*

Division of an established community typically involves constructing a physical barrier to neighborhood access, such as a new freeway, or removing a means of access, such as a bridge or a roadway. The proposed project would entail the reconstruction and modernization of an existing sand processing facility on the Pier 92 project site. The project would gate the existing entry driveway into the facility, would close the existing exit driveway (i.e., from the existing truck scales), and reconfigure the existing driveway south of the existing facility that is currently used for wetlands access as a new gated exit driveway for the facility. No other changes to the adjacent roadway network would be made. The proposed project would not construct a physical barrier to surrounding uses that would divide an established community. Accordingly, the proposed project would have a less-than-significant impact with respect to physically dividing an established community. Mitigation measures would not be necessary.

Impact LU-2: The proposed project would not cause a significant physical environmental impact due to a conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. *(Less than Significant)*

Land use impacts could be considered significant if the proposed project were to conflict with any plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental impact. Environmental plans and policies are those that directly address environmental issues and/or contain targets or standards that must be met to preserve or improve characteristics of the city's physical environment. As described in Section C, Compatibility with Existing Zoning and Plans, the proposed project would not conflict with any adopted environmental plan or policy.

The proposed project would not obviously or substantially conflict with any adopted environmental plan or policy, including the 2017 Clean Air Plan, as discussed in draft EIR Section 3.C, Air Quality or San Francisco's Strategies to Address Greenhouse Gas Emissions (GHG Reduction Strategy), as discussed in Section E.9, Greenhouse Gas Emissions. Therefore, the proposed project would have a less-than-significant impact with

regard to conflicts with land use plans, policies, or regulations adopted for the purpose of avoiding or mitigating an environmental effect. Mitigation measures would not be necessary.

Impact C-LU-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact related to land use and planning. ***(Less than Significant)***

Cumulative development in the project vicinity (within a 1,000-meter radius of the project site) includes projects that are either under construction or for which the planning department or Air District has a project or permit application on file. Most of the cumulative development in the project vicinity (draft EIR p. 3-8, and mapped in Figure 3-1, Cumulative Projects within a 1,000-Meter Radius of the Project Site, p. 3-12) involves site improvements, such as open space revegetation; roadway, bikeway, and pedestrian improvements, including a new bridge; alterations to existing permits; new utility and site seismic and flooding improvements; new park and recreational facilities; and warehouse and parking facility improvements. Overall, these projects would result in minor intensification of land uses in the project vicinity, similar to the proposed project. The cumulative projects would not combine with the proposed project to alter the land use pattern of the immediate area or physically divide an established community. Therefore, the proposed project, in combination with cumulative projects, would not result in cumulative land use impacts. Accordingly, cumulative impacts related to land use would be less than significant. Mitigation measures would not be necessary.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
2. AESTHETICS. Would the project:					
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☒	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒	☐
c) In nonurbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐	☐

ENVIRONMENTAL SETTING

Terminology

The following concepts and terminology are used throughout this analysis to describe the existing visual setting and the visual setting with the proposed project:

- *Visual character* is a general description of the visual attributes of a particular setting. The purpose of defining an area's visual character is to provide the context within which the visual quality of a particular site or locale is most likely to be perceived by the viewing public. For urban areas, visual character is typically described on the neighborhood level, or in terms of areas with common land use, development intensity, and/or urban design features. For natural and open space settings, visual character is most commonly described in terms of areas with common landscape attributes (e.g., landform, vegetation, water features).
- *Visual quality* is defined as the overall visual impression or attractiveness of a site or locale as determined by its aesthetic qualities (such as color, variety, vividness, coherence, uniqueness, harmony, and pattern).
- *Scenic vistas* are locations from which the public can experience unique and exemplary views, typically from elevated vantage points that offer panoramic views of great breadth and depth.
- A *viewshed* is an area of land, water, or other urban or environmental element that is visible to the human eye from a fixed vantage point.

Visual Character of Project Site Vicinity

The project site is bound by Islais Creek Channel to the north, the Pier 94 wetlands to the east, Seawall Lot (SWL) 352 and Piers 94 and 96 to the south, and Amador Street to the west. The project site is in the Maritime Eco-Industrial Center area, a 51-acre area characterized by industrial warehouses, maritime businesses, cargo terminals, and other cargo shipping and support operations. The Maritime Eco-Industrial Center area includes the Blue Greenway and a variety of open spaces, ranging from small connector parks to the Port's largest open space, Heron's Head Park. The area also includes small boat launches with access to San Francisco Bay (Bay) and Islais Creek, skateboard parks, and preserved tidal wetlands habitat. The open spaces and scenic vistas that are visible to and/or from the project site are described below.

The Port of San Francisco provides a Blue Greenway that runs from China Basin to the north to Heron's Head Park to the south, and farther into South San Francisco. The Blue Greenway is part of the San Francisco Bay Trail that connects 500 miles of paths across the Bay Area with a current and planned series of parks, public access areas, and Bay water recreation facilities along the southeastern waterfront. In the vicinity of the project site, Illinois Street and Cargo Way are designated as the Blue Greenway. The project site is partially visible from the nearest segment of the Blue Greenway, but due to the flat topography in the area is mainly obstructed from view by intervening structures and fencing.

The San Francisco Bay Area Water Trail is a state-established network of water recreation sites for nonmotorized small boats, such as kayaks, canoes, dragon boats, and stand-up paddle and wind surf boards. The Water Trail is immediately adjacent to the project site in Islais Creek; therefore, the project site is highly visible from the Water Trail. The urban shoreline of Islais Creek provides recreation opportunities and is the subject of resilience strategies to protect the Bay shoreline and the local community from sea level rise. In addition, due to the maritime uses in the area, including Pier 80 to the north of the project site, cargo ships and barges are frequently moored in Islais Creek.

Tulare Park is approximately 0.4-mile northwest from the project site, across Islais Creek Channel. The park is an approximately 0.32-acre shoreline park on the north shore of Islais Creek, between Third Street and Illinois Street. The park provides access to the shoreline of Islais Creek. Dominant foreground views include both operational and inactive industrial and warehousing facilities as well as maritime uses. Highly channelized views of the buildings at Pier 92 are visible from Tulare Park but are largely blocked by the towering structures at the adjacent Pier 90 property and the concrete batch plants.[1]

Bayview Gateway Park is approximately 0.4-mile to the west of the project site in the Bayview neighborhood at the corner of Cargo Way and 3rd Street. Dominant foreground views include both operational and inactive industrial and warehousing facilities as well as maritime uses. Highly channelized views of the buildings at Pier 92 are visible from Gateway Park but are largely blocked by intervening fences and the towering structures at the adjacent Pier 90 property.

Visual Character of Project Site

The existing facility is used for marine sand offloading and processing. The site is currently unpaved, with the exception of the area after the truck scale, which is paved; approximately 10,000 square feet of the existing project site is impervious. The project site includes processing equipment such as conveyors, radial stackers, sand washing equipment, feed hoppers, raw material stockpiles, and truck delivery staging with a wheel wash system and track-out control mat. The project site also includes two office trailers that serve as administrative offices. There are also storage areas and shipping containers for the storage of hazardous materials, mainly used oil and non-hazardous materials. Parking for at least ten employees and/or visitors is also located in this area. The maximum height of the tallest existing equipment is approximately 40 feet above grade.

Viewsheds and Scenic Vistas

Across Islais Creek to the north is Pier 80, which is an active terminal. From the project site, features of Pier 80 are visible including warehouse buildings, large cranes, and visiting cargo ships and barges moored at the pier. Views to the east of the project site include the expansive open space of Pier 94 wetlands and the Bay, with background views of the East Bay Hills. The area to the south is currently used by the public to access the Pier 94 wetlands area east of the project site. However, generally views to the south are limited due to fencing, warehouse and industrial buildings and equipment, and mature trees. Although highly channelized views of Potrero Hill are visible in the background to the west, because of distance and intervening structures, other background views are obstructed. While the project site is slightly visible from nearby open spaces in the Maritime Eco-Industrial Center area (as discussed above), the project site is not visible from elevated scenic vistas, such as those from Potrero Hill.

APPROACH TO ANALYSIS

The analysis of potential aesthetic impacts involves a qualitative comparison of the existing built and natural environments to the future built and natural environments and an evaluation of the visual changes that would result from implementing the proposed project. Key views were examined and existing views were compared to those expected to occur with implementation of the proposed project. Relevant urban design policies and guidelines were examined to determine whether implementation of the proposed project would

[1] Per Table 1, Existing Piers 80–96 Predominant Uses, in the Maritime Eco-Industrial Center Strategic Plan, existing uses at Pier 92 (in addition to existing activities on the project site), include CEMEX (concrete batching) and Central/Blande Concrete (concrete batching) and their related buildings.

conflict with applicable zoning and other regulations governing scenic quality or create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.

IMPACTS AND MITIGATION MEASURES

Impact AES-1: The proposed project would not have a substantial adverse effect on a scenic vista. *(Less than Significant)*

As noted previously, a scenic vista is generally considered to be a location from which the public can experience high-quality views, typically from elevated and uninterrupted vantage points that offer panoramic views of great breadth and depth. Scenic vistas may be officially recognized or designated (e.g., within local planning documents or the California Department of Transportation scenic highway program) or may be informal (e.g., mountain peaks or coastal bluffs). The project site is generally level, and views of San Francisco Bay, Islais Creek, and the East Bay hills provide visual relief from the built environment of the Maritime Eco-Industrial Center area and surrounding areas.

The proposed project would modernize and reconstruct the existing sand processing facility by installing new equipment, constructing a new storage warehouse, and paving and reconfiguring the site. New equipment would be located in the same general area as the current equipment (i.e., eastern portion of the site). The raw material stockpile would be in the same area, but with an expanded footprint along an arc extending to the northeast (see draft EIR Figure 2-3, p. 2-7). The small oversize material pile would shift from the southeast portion of the site to a northeast location. Unlike existing conditions, the washed sand stockpile would now be stored in a new enclosed warehouse. The warehouse would be approximately 140 feet by 220 feet with a maximum height of 63 feet. The outer walls and roof would consist of metal siding.

Although the project site is slightly visible from surrounding open space areas (i.e. Blue Greenway, Tulare Park, and Bayview Gateway Park), as described above, none of these areas are considered to afford scenic vistas due to their location and limited views of significant landscape features. The project site is highly visible from the Water Trail along Islais Creek, but the views currently consist of industrial and port activities. Therefore, changes in the view from the Water Trail (most notably the new 63-foot-tall, enclosed storage warehouse) would not constitute an adverse effect on a scenic vista.

The higher elevations of San Francisco, such as Potrero Hill, provide vistas of the city, the Bay, and the East Bay Hills looking east. However, the height of the proposed enclosed warehouse building would not substantially affect these vistas due to the distance from the viewers to the project site, the superior position of the viewers relative to the project site, the built-out urban nature of the city, and the vast expanse of the Bay views. The proposed structure and other industrial equipment would comprise a minor element in views from higher elevations of San Francisco. As such, the proposed project would have a less-than-significant impact on views of the Bay as seen from scenic vistas. Mitigation measures would not be necessary.

Impact AES-2: The proposed project would not substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway. *(No Impact)*

No state-designated scenic highways are located near the project site. The closest officially designated state scenic highway is Interstate (I) 280; the segment of I-280 closest to the project site (approximately 0.8 mile) is an “eligible” scenic highway, but not officially designated. The closest segment of I-280 that is an officially

designated state scenic highway is approximately 8 miles to the southwest.[2] Because of distance, topography, and intervening structures and vegetation, the project site is not visible from this segment of I-280. In addition, the proposed project would be developed on previously developed property that does not contain any scenic resources such as vegetation and rock outcroppings, or currently identified historic buildings. Therefore, no impact would occur related to substantial damage to scenic resources.

Impact AES-3: The proposed project would not conflict with applicable zoning and other regulations governing scenic quality. *(Less than Significant)*

The proposed project would allow for the existing operation to continue on a redesigned site with modern equipment and improved environmental controls. The washed sand stockpile would be stored in a new enclosed warehouse with a maximum height of 63 feet. The outer walls and roof would consist of metal siding (26 gauge). Some translucent panels on the roof would allow natural light into the structure. In addition, fixtures for artificial lighting would be installed within the structure on the project site. Section 260(b)(2)(M) of the San Francisco Planning Code exempts from the height requirement all structures and equipment necessary for operation of industrial plants, and where structures and equipment do not contain separate floors, where permitted as principal or conditional uses by the Code. Therefore, the proposed project would be consistent with the Planning Code with regards to height of the proposed structure.

The proposed project would not conflict with any goals or policies in the San Francisco General Plan. proposed project would modernize and reconstruct the existing sand processing facility by installing new equipment, constructing a new warehouse, and paving and reconfiguring the project site. The project would not otherwise conflict with any general plan policies or objectives. Therefore, the project would not be inconsistent with goals and policies in the San Francisco General Plan that govern scenic quality. The proposed project also would not conflict with any goals or policies in the Waterfront Plan pertaining to scenic quality. Therefore, the proposed project would have a less-than-significant impact with regard to conflicts with applicable zoning and other regulations governing scenic quality and no mitigation measures are necessary.

Impact AES-4: The proposed project would not create a new source of substantial light or glare which would adversely affect day or nighttime views in the area. *(Less than Significant)*

Light pollution refers to all forms of unwanted light in the night sky, including glare, light trespass or spill on adjacent sensitive receptors, sky glow, and over-lighting. Views of the night sky are an important part of the natural environment. Excessive light and glare can be visually disruptive to humans and nocturnal animal species. Lighting at the project site and its surroundings generally includes street lighting, vehicle headlights on local streets and I-280, exterior security lighting, and interior and exterior lighting from buildings located offsite.

Implementation of the proposed project would result in an incremental increase in new sources of nighttime light and daytime glare compared to existing conditions. The outer walls and roof would consist of metal siding (26 gauge). Translucent panels on the roof would allow natural light into the structure. In addition,

[2] California Department of Transportation, *California State Scenic Highways*. 2025, https://dot.ca.gov/ programs/design/lap-landscape-architecture-and-community-livability/lap-liv-i-scenic-highways, accessed August 21, 2025.

fixtures for artificial lighting would be installed within the structure. The new sources of nighttime light or glare could be noticeable to drivers on nearby roadways or diminish views of the night sky. However, the lighting in the warehouse would be shielded, thereby reducing impacts. New sources of daytime glare would include the translucent panels on the new building or equipment. However, compared to existing conditions at the project site and in the surrounding area, changes in daytime glare would be minimal.

The lighting performance standards set by Leadership in Energy and Environmental Design (LEED) would be followed through adherence to lighting specifications, shielding techniques, automatic lighting controls, and light pollution considerations. Energy-efficient site lighting and designs that meet Illumination Engineering Society of North America lighting density and control standards would attempt to minimize light pollution. The proposed project would have a less-than-significant impact regarding day or nighttime views. Mitigation measures would not be necessary.

Impact C-AES-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact related to aesthetics. ***(Less than Significant)***

Cumulative development in the project vicinity includes warehouse and parking improvements; roadway, bikeway, and pedestrian improvements; new utility and site seismic and flooding improvements; new park and recreational facilities; and open space revegetation. As analyzed above, the visual character of the other reasonably foreseeable project buildings would be mostly consistent with existing development surrounding the site. The reasonably foreseeable projects would be required to adhere to height limits for buildings as well as land coverage, density, setback, and design guidelines. Therefore, the other projects would not be expected to change the quality of the area in a way that would be incompatible with the existing visual character. As described above, the proposed project would not degrade the visual character or quality of the project site or its surroundings and would not conflict with regulations governing scenic quality. All proposed development would be required to adhere to their respective design controls and consider the existing environment and views. Therefore, cumulative impacts on onsite and offsite visual quality would be less than cumulatively considerable.

The other cumulative development in the area includes new illumination sources (e.g., solar lighting) that would increase nighttime lighting, ambient light glow, and glare levels (e.g. from interior and exterior building lighting, street and pedestrian pathway lighting, parking lot lighting, and vehicle headlights). Reflective building surfaces (from proposed self-storage units) could increase glare. Other cumulative projects could involve redevelopment or infill of urban sites that already generate light and glare or receive light and glare from surrounding existing sources. Therefore, these projects are not anticipated to be large enough in scale to result in a substantial increase in nighttime lighting and glare conditions in the area. Therefore, cumulative impacts from daytime and nighttime lighting and glare would be less than significant. Mitigation measures would not be necessary.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
3. POPULATION AND HOUSING. Would the project:					
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☒	☐	☐
b) Displace substantial numbers of existing people or housing units, necessitating the construction of replacement housing?	☐	☐	☐	☒	☐

IMPACTS AND MITIGATION MEASURES

Impact PH-1: The proposed project would not induce substantial unplanned population growth, either directly or indirectly. *(Less than Significant)*

In general, a project would be considered growth inducing if its implementation were to result in substantial unplanned population growth in an area, either directly or indirectly. Construction of the project would require few construction workers over the seven-month schedule. Construction trends indicate that these workers would come from the existing workforce. Therefore, they would not induce substantial unplanned population growth.

The project proposes no housing. Therefore, operation of the project would not induce substantial unplanned residential population growth. The proposed project also would not indirectly induce substantial unplanned population growth in the project area due to infrastructure improvements because the project site is an existing sand processing facility and does not propose any extensions to area roads or other infrastructure that could enable additional development in currently undeveloped areas.

Five employees currently work at the sand processing facility, which is open for customer loadout from 5 a.m. to 3 p.m. Monday through Friday. Barge unloading and sand washing/screening operations can occur 24 hours per day year-round. The proposed uses on the project site would result in one new job. The increase in employment under the proposed project would be negligible in the context of the total number of jobs in San Francisco. Therefore, the proposed project would not directly or indirectly induce substantial unplanned population growth. The impact of the proposed project would be less than significant. Mitigation measures would not be necessary.

Impact PH-2: The proposed project would not displace substantial numbers of existing people or housing units, necessitating the construction of replacement housing. *(No Impact)*

The proposed project would not displace residents or housing units because no housing units currently exist on the project site. Therefore, the proposed project would have no impact related to the displacement of housing units or people. It would not necessitate the construction of replacement housing. Mitigation measures would not be necessary.

Impact C-PH-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact related to population and housing. ***(Less than Significant)***

The geographic context for potential cumulative employment and population impacts encompasses the city of San Francisco. Implementation of the proposed project would generate one new job, which would be an insubstantial contribution to employment growth in the city. Given this minor contribution, the project would not combine with cumulative projects to result in a substantial unplanned direct or indirect impact on employment and population growth. Therefore, the cumulative impact related to employment and population growth would be less than significant. Mitigation measures would not be necessary.

———————————————

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
4. CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5, including those resources listed in article 10 or article 11 of the San Francisco Planning Code?	☐	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archeological resource pursuant to Section 15064.5?	☐	☒	☐	☐	☐
c) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐	☐

REGULATORY SETTING

California Register of Historical Resources

The criteria for listing historical resources in the California Register of Historical Resources (California Register) are consistent with those developed by the National Park Service for listing historical resources in the National Register of Historic Places (National Register) but have been modified for state use in order to include a range of historical resources that better reflect the history of California. Public Resources Code (PRC) section 5024.1 establishes the California Register, which it describes as "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change." The California Register automatically includes all properties listed in or determined eligible for listing in the National Register as well as some California Historical Landmarks and California Points of Historical Interest. Title 14 of the California Code of Regulations (CCR), section 4852, governs eligibility for listing in the California Register and sets forth the criteria for evaluating significance and the historical integrity of that significance.

A resource must have significance at the local, state, or national level under one or more of the four criteria listed below to be eligible for listing in the California Register.

1. The resource is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States (Criterion 1).
2. The resource is associated with the lives of persons important to local, California, or national history (Criterion 2).
3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction or represents the work of a master or possesses high artistic values (Criterion 3).
4. The resource has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (Criterion 4).

In addition, CCR Title 14, section 4852(d)(2), establishes a threshold for historical resources that achieved significance within the past 50 years:

> In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than fifty (50) years old may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to understand its historical importance.

Unique Archeological Resources

Under PRC Section 21083.2, a unique archeological resource is an object, artifact, or site that:

1. Contains information needed to answer important scientific research questions and there is a demonstrable public interest in that information;
2. Has a special and particular quality, such as being the oldest of its type or the best available example of its type; or
3. Is directly associated with a scientifically recognized important Native American or historic event or person.

ENVIRONMENTAL SETTING

The project site is part of a larger parcel with a diverse history of reclamation and development. Under the direction of the planning department, a historic resource evaluation (HRE) that focuses on the project site (rather than the entire parcel) was conducted to determine if the site contains any historic resources.[3] See the HRE in Appendix C of this document for the full site history and evaluation.

Current Land Use

Since at least 1982, the project site has been operating as a sand processing facility. The project site contains a sand processing plant with no permanent buildings. The site comprises multiple raw material stockpiles and sprayers, conveyor belts, storage structures, and mechanical equipment associated with sand processing. Temporary ancillary buildings provide space for vehicle fueling and work assistance (i.e.,

[3] ICF, *Historic Resource Evaluation for the Pier 92 Modernization and Plant Replacement Project*, prepared for San Francisco Planning, July 2025.

bathrooms), life safety equipment storage, and meetings. The current configuration of the sand processing plant on the project site dates to approximately 2011. Various pieces of sand processing equipment from the 1990s are the oldest built components within the project site boundary. A fueling station, the oldest extant and semi-permanent built component on the site, was relocated to a different location on the site between 2018 and 2020.[4,5]

Paleoenvironmental Landscape Context

During the late Pleistocene epoch, lowered sea levels transformed San Francisco Bay into a river valley with cooler, wetter conditions and diverse flora and fauna, including now-extinct mammals. Wind-driven sedimentation during this time created extensive dune fields, which may contain buried archeological resources due to evidence of human presence in North America. During the early to middle Holocene epoch, rising sea levels inundated the San Francisco Valley, forming San Francisco Bay and halting dune formation along the peninsula. Although humans very likely settled in the area during this time, archeological evidence is scarce due to submersion and burial beneath bay-bottom sediments, with only two recorded archeological sites known from this era, dating to around 7,500–7,900 years ago. Modeling of sea-level rise over the last 10,000 years indicates that the project site was very likely submerged by the rising waters of the Bay between 8,000 and 10,000 years ago BP. [6]

Around 4,000 years ago, sea-level rise slowed, allowing tidal marshes to form along San Francisco Bay as alluvial sediments accumulated; human settlement around the Bay increased significantly. Over the next 2,000 years, Native American communities established villages near expanding marshes, and a renewed dune formation influenced the location of freshwater ponds and drainages, amid ongoing climatic shifts toward warmer and drier conditions. During the middle to late Holocene, Native Americans sustainably managed local resources without significantly altering San Francisco's landscape.

Geological Setting

Geotechnical testing consisting of one auger bore to a depth of 301 feet below ground surface at the project site indicates that the site is underlain by fill to 45 feet (see the Geotechnical Report included as Appendix F) . Below the fill is Young Bay Mud to a depth of 123 feet, which overlies older sediment to a depth of 132 feet. Below this is Old Bay Mud; bedrock is at about 300 feet below ground surface.

Native American Cultural Setting

The Terminal Pleistocene (13,500–11,600 calibrated years before present [cal BP]) in California, contemporaneous with the Clovis and Folsom periods, is poorly understood and rarely evidenced—especially in the Bay Area—due to the mobile nature of early populations and the effects of sea-level rise, erosion, and subsidence, which most likely destroyed or buried archeological remains. The Early Holocene (11,600–7700 cal BP) cultural landscape of central California featured semi-mobile hunter-gatherers within diverse environments, but little evidence of this period exists in the Bay Area due to rapid sea-level rise that most likely submerged coastal sites, with only a few buried inland sites documented and one recently

[4] Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 2018, https://www.historicaerials.com/viewer, accessed April 12, 2025.

[5] Ibid., 2020.

[6] Meyer, Jack, and Paul Brandy, *Geoarcheological Assessment and Site Sensitivity Model for the City and County of San Francisco, California,* 2019, report prepared by Far Western for the Environmental Planning Division of the San Francisco Planning Department. On file at the San Francisco Planning Department.

discovered submerged shell midden to support this hypothesis. The Middle Holocene (7700–3800 cal BP) in the Bay Area saw an increased population, longer seasonal occupations, and more complex subsistence strategies, with more than 30 archeological sites and several burials, indicating a shift toward lacustrine and maritime resource use as San Francisco Bay's estuarine environments expanded. The Late Holocene (3800–170 cal BP) in the Bay Area is marked by more than 200 documented sites, showing increased settlement permanence, social complexity, diverse subsistence strategies, and extensive trade networks, with notable developments such as shellmound construction, acorn consumption, and bow and arrow usage.[7]

Ethnographic Context

Humans have inhabited San Francisco for more than 7,600 years. Prior to the arrival of European explorers in central California in the 18th century, the entire San Francisco Bay region was occupied by Ohlone Native Americans. The present boundaries of San Francisco were inhabited by the *Ramaytush* Ohlone tribe.[8] These hunter-gatherers occupied various sites, based on the seasonal availability of resources. Both the population and the locations of villages were fluid. The population of *Ramaytush* Ohlone speakers in the 1700s has been estimated at approximately 1,400,[9] 1,500,[10] and 2,000.[11] The boundaries of today's San Francisco generally correspond with the territory of the *Yelamu*, an independent tribe or tribal community of the *Ramaytush* Ohlone peoples,[12] which, according to estimates, included approximately 140 individuals at the time of the Spanish arrival in San Francisco in 1776.[13] Mission records suggest that the *Yelamu*, like other Ohlone tribes, were composed of a number of smaller bands, with each made up of several 10- to 15-person households that were associated with a village or a cluster of villages within the tribe's territory.

Locational data and familial relationships among persons listed in Mission San Francisco de Asís (Mission Dolores) records suggest[14] that there were three *Yelamu* bands in San Francisco, each associated with a certain village or villages:

> *Sitlintac* and *Chutchui*, only a mile or two apart in the valley of Mission Creek, seem to have been Yelamu sites used at different times of year by one band of families. Another Yelamu band seems to have used the village sites of *Amuctac* and *Tubsinte* in the Visitacion Valley area in the same way. *Petlenuc*, perhaps near the site of the Spanish Presidio compound, seems to have been [the village of] a third small band.

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7 Ibid.

8 Levy, R., Costanoan, in *Handbook of the Indians of North America*, Volume 8, California, R. Heizer (ed.), Smithsonian Institution, Washington, D.C, 1978, p. 485; Levy, R., *Costanoan Internal Relationships*, manuscript prepared for the Archeological Research Facility, Department of Anthropology, University of California, Berkeley by Richard Levy, Department of Anthropology, University of Kentucky, 1976, Figure 1, p. 57.

9 Levy, R., Costanoan, in California, *Handbook of the Indians of North America*, volume 8, R. Heizer (ed.). Smithsonian Institution, Washington, D.C., 1978.

10 Bocek, B., Subsistence, Settlement, and Tribelet Territories on the Eastern San Francisco Peninsula, in *24th Proceedings of the Annual Meeting of the Society for California Archaeology, 5*:269–297, 1992, https://scahome.org/publications/proceedings/Proceedings.05Bocek.pdf.

11 Milliken, R.T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810,* Menlo Park, CA: Ballena Press, 1995, Map 4, p. 228.

12 Ibid.

13 Milliken, R., L. Shoup, and B. Ortiz, *Ohlone/Costanoan Indians of the San Francisco Peninsula and Their Neighbors, Yesterday and Today*, prepared by archaeological/historical consultants for National Park Service, Golden Gate National Recreation Area, San Francisco, CA, 2009, Table 4, p. 64.

14 Milliken, R.T., *A Time of Little Choice: The Disintegration of Tribal Culture in the San Francisco Bay Area, 1769–1810,* Menlo Park, CA: Ballena Press, 1995, p. 260.

Other scholars argue, based on proximity to other *Yelamu* villages along the Bay shoreline, that the use of particular villages was not seasonal and that movement by family and village members between their home village and other villages within their tribal territory appears to have been quite fluid.

The Ohlone managed the land through controlled burning (a practice that also delineated territories), along with tilling, planting, irrigating, weeding, and pruning.[15] They produced woven baskets, tools made from stone and animal bone, and beads and other ornaments for local and regional trade with other tribes. A major disruption to Ohlone cultural practices and a decrease in population occurred following initial colonization of the region by Spanish settlers.

Historical Context

Bayview is a large residential and industrial district in southeast San Francisco, covering 3,132 acres and encompassing neighborhoods like Hunters Point, India Basin, Silver Terrace, and Bret Harte. Its boundaries are Cesar Chavez Boulevard to the north, U.S. 101 (Bayshore Freeway) to the west, Candlestick Hill to the south, and San Francisco Bay to the east and south. Initially characterized by coastal grasslands, sage scrub hillsides, and marshlands, the area's industrial history began with the construction of the San Francisco Dry Dock at Hunters Point in 1866, followed by the establishment of Butchertown on Islais Creek (west of the project site) and later the formation of the Islais Creek Channel. Due to gradual infill with modern materials, the current shoreline in the vicinity of the project site is approximately 0.4 mile northeast of the historic shoreline recorded in 1850.

Throughout the 20th century, marsh and tideland infill projects transformed the waterfront along the Bayview neighborhood. Much of the seawall that forms the eastern edge of San Francisco is the result of various reclamation projects, which were intended to create a uniform waterfront along the east side of the city. After the 1906 San Francisco earthquake and fire, Islais Creek was partially filled with debris. The creek and surrounding marshes were viewed as a barrier to further development within the southern portion of San Francisco. Until the mid-1910s, efforts for reclamation were unsuccessful. In 1915, the State of California passed legislation to enable creation of the Islais Creek Reclamation District. The creation of this district led to marsh and tideland infill projects, including the dredging of Islais Creek and the creation of a 2,000-foot-long rock seawall to form the Islais Creek Channel.[16] The State of California proposed the Islais Creek Inland Harbor Project in 1917 to create a number of additional ports, piers, and terminals along the southern San Francisco waterfront. In 1918, the Board of State Harbor Commissioners purchased and infilled the lots along the southern bank of the Islais Creek Channel.[17] The area that encompasses Piers 90 to 96, as well as the project site, was part of an infill project along the south bank of Islais Creek in the Bayview neighborhood during the late 1910s and early 1920s.

By World War I, industrial use extended southward along the central waterfront to Islais Creek, leading to extensive landfill for industrial sites. Work along the first section of reclaimed land was completed by 1939.[18] The Port used the majority of the piers in the city for industrial production during World War II; the Port

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15 Lightfoot, K. G., O. Parrish, L. M. Panich, T. D. Schneider, and K. E. Soluri, *California Indians and Their Environment: An Introduction,* Berkeley, CA, University of California Press, 2009, pp. 82–83.

16 San Francisco Planning Department, *Central Waterfront Cultural Resources Survey*, prepared for the City and County of San Francisco Planning Department, October 2011.

17 Architectural Resources Group, Inc., *Pier 90 Historic Resource Evaluation*, prepared for the Port of San Francisco, January 2018.

18 U.S. Geological Survey, *San Mateo, CA* (topographic map), 1:250,000, 15-minute series, Denver, CO: USGS, surveyed 1939.

returned the piers to commercial use in the late 1940s and 1950s.[19,20] The prominence of the Bayview neighborhood grew during World War II when the U.S. Navy acquired the Hunters Point Dry Dock, attracting thousands of war workers, many of whom were African American, and solidifying Bayview as a major industrial zone on the West Coast.[21]

The project site lay within the waters of the Bay until the mid-20th century. Between 1962 and 1964, the piers east of Pier 90, including the project site, which is on reclaimed land (Pier 92), were created by the enclosure and infill on 22 blocks of tidelands on the south side of Islais Creek.[22,23] The infill plan was part of ongoing efforts of government agencies and industrialists to develop the last vacant industrially zoned land in San Francisco. In 1962, the Port announced its plans to enclose and fill 22 blocks of tidelands on the south side of Islais Creek, which extended the project site parcel and created the piers east of Pier 90. The plan was part of ongoing efforts of government agencies and industrialists to develop the last vacant industrially zoned land in San Francisco.[24] Between 1962 and 1964, the project site's reclaimed land (Pier 92) was created.[25,26] The geotechnical report states that "in the 1960s an underwater perimeter dike was constructed to retain fill for a new port terminal. Bay Mud soil dredged from the Bay was pumped behind the dike until the fill was generally above the level of the Bay. Debris fill was then pushed out to continue filling. Finally, a thin cap of relatively 'clean' sand fill was placed to bring the site close to its current grade."[27] Upon creation of the project site, the pier was put to commercial use as a container ship terminal. Various imports and exports were handled through the container terminal from the 1960s to the 1980s, necessitating associated equipment, machinery, and materials on land. In the 1960s, in particular, Volkswagen used a section of Pier 92 to import automobiles into Northern California.[28] In the 1970s and 1980s, a section of the pier was a common destination and berth for international tankers that transported or stored large quantities of liquids or gases.[29] See the HRE in Appendix C of this document for the full site history, including development into the 21st century.

APPROACH TO ANALYSIS FOR BUILT RESOURCES

The built and mechanical components of the Pier 92 facility include a fueling station, temporary ancillary buildings, sprayers, conveyor belts, and other mechanical equipment associated with sand processing. These components are not historic in age; therefore, they were evaluated to determine if they are significant at the local, state, or national level and if sufficient time has passed to understand their historical

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19 Corbett, Michael R., *Port City: The History and Transformation of the Port of San Francisco, 1848–2010*, pp. 62–63, San Francisco: San Francisco Architectural Heritage, 2001.

20 Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 1968, https://www.historicaerials.com/viewer, accessed April 12, 2025.

21 Kelley & Verplanck Historical Resources Consulting, *Bayview-Hunters Point Area B Survey, Town Center Activity Node, San Francisco, California,* prepared for the San Francisco Redevelopment Agency, February 2010.

22 Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 1956, https://www.historicaerials.com/viewer, accessed April 12, 2025.

23 U.S. Geological Survey, *San Francisco, CA* (topographic map), 1:250,000, 15-minute series, Denver, CO: USGS, surveyed 1956.

24 Ibid.

25 Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 1956, https://www.historicaerials.com/viewer, accessed April 12, 2025.

26 U.S. Geological Survey, *San Francisco, CA* (topographic map), 1:250,000, 15-minute series, Denver, CO: USGS, surveyed 1956.

27 Kleinfelder, 8/27/2024

28 *San Francisco Examiner*, "Landmark for VW Imports," January 26, 1964:18.

29 Ibid., "Ships," January 8, 1980:44.

significance. A summary of the evaluation of the built components under California Register Criteria 1 through 4 is provided below.

- *Criterion 1:* The built components of the Pier 92 facility were added to the project site long after initial development of the Port of San Francisco and establishment of the Bayview area as an industrial center. Since the 1980s, the mechanical equipment, portable buildings, and structures on the project site have been moved and replaced, as is typical of utilitarian components that continuously serve industrial processes. As a more contemporary addition to the area, the Pier 92 facility overall does not appear to have had a significant impact on the industrial development or economic success of the Port of San Francisco. As such, the project site does not appear to be significant under California Register Criterion 1.
- *Criterion 2:* The built components of the Pier 92 facility have a general association with the Port of San Francisco, which has continuously owned and leased the property as part of a larger effort to retain industrially zoned land in San Francisco. The facility does not appear to be identified with an individual who was associated with the private companies that leased the site and, specifically, is not directly tied to the achievements of any one individual whose activities are demonstrably important in the history of the Port of San Francisco or its lessees. As such, the project site does not appear to be significant under California Register Criterion 2.
- *Criterion 3:* The built components of the Pier 92 facility were not constructed using innovative techniques, nor were they the first or only example of their kind in operation in the late 20th century. Industrial in design and utilitarian in function, the property does not represent the work of a master architect or possess high artistic values. As such, the project site does not appear to be significant under California Register Criterion 3.
- *Criterion 4:* Located on reclaimed land established between 1962 and 1964, the project site does not appear to be significant as a source, or likely source, of important historical information on the history of the Bayview neighborhood, San Francisco, or California. It does not appear likely to yield important information about historic construction methods, materials, or technologies. As such, the project site does not appear to be significant under California Register Criterion 4.

IMPACTS AND MITIGATION MEASURES

Impact CR-1: The proposed project would not cause a substantial adverse change in the significance of a historical resource pursuant to Section 15064.5. *(No Impact)*

The built-environment components on the project site are not eligible for listing in the California Register; as such, the project site does not contain any historical resources. Although the project site does not contain historical resources, it is part of a much larger parcel (Assessor's Parcel Number [APN] 4502A/002 [approximately 7.8 million square feet]) that contains one historical resource, Fire Station No. 25, which is individually listed in the California Register. However, Fire Station No. 25 is approximately 2,500 feet from the project site and has no aesthetic or historic relationship with the project site (see Appendix X). One other historic resource has been identified immediately adjacent to the larger parcel, the Islais Creek Bridge, which was determined to be individually eligible for listing in the National Register and is listed in the California Register. The Islais Creek Bridge also has no physical relationship to the project site, being more than 0.5 mile (2,640 feet) away. Because the project site does not contain historical resources, and the closest identified historical resources (within or adjacent to APN 4502A/002), are more than 0.5 mile from the project

site, there is no potential for the proposed project to have a direct or indirect impact on historic resources.[30] As such, redevelopment of the project site would not alter the significance of a historical resource, as defined in section 15064.5 of the CEQA Guidelines. Therefore, the proposed project would have no impact on historical resources and no mitigation measures are required.

Impact CR-2: The proposed project could cause a substantial adverse change in the significance of an archeological resource. *(Less than Significant with Mitigation)*

A cultural resource review (CRR) memo was prepared for the project, as summarized here.[31] The project site is located just south of the Islais Creek Channel feeding into San Francisco Bay. No archeological sites have been recorded within a 0.25-mile radius of the project site.

The project site was submerged by bay waters between 8,000 and 10,000 years ago. The CRR determined that the project site has sensitivity for Native American archeological resources that predate the inundation. If present, these resources would be at the top of the older sediments layer at about 123 feet below ground surface. However, the CRR notes that the project would not affect these Native American resources because project ground disturbance would extend only to depths of 5 feet, which is within historical fill. There is low potential for redeposited Native American resources to be within the fill layer.

The historic shoreline was gradually filled as construction of the piers expanded until the 1960s when an underwater perimeter dike was constructed and filled with Bay Mud dredged from San Francisco Bay and capped with debris fill and sand. The project site lay within the waters of the Bay until the 1960s. There are no known 19th-century maritime-related resources such as shipwrecks or wharfs within the project site. Geotechnical testing indicates that the project site is underlain by about 45 feet of fill that consists of dredged bay mud below a layer of debris fill; a layer of relativity clean sand fill was placed on the top. The fill may contain resources related to shipping and storage, as discussed above. The CRR identified the fill at the project site as having low potential for historic-era resources, based on the late date of development. Any 19th cultural materials intermixed with modern fill would be in a secondary context.

The proposed ground disturbance for the project would total around 3,330 cubic yards. Paving and regrading is estimated to require 1 foot of excavation. Trenching for a stormwater system and electrical utilities would require about 3 feet of excavation. Work for new equipment foundations would require 2 to 5 feet of excavation. All of the project ground-disturbing work would be within the fill layer. The fill layer has low potential for redeposited Native American and historic-era archeological resources. Redeposited Native American archeological resources may be eligible for listing in the California Register of Historical Resources (CRHR), despite loss of physical integrity, if they represent a single chronological or cultural component, include human remains or other significant features, or include outstanding examples of a particular data class or classes. If any redeposited Native American archeological resources are encountered during project implementation, a potentially significant impact may occur. Therefore, **Mitigation Measures M-CR-2: Procedures for Discovery of Archeological Resources,** which includes provisions for the discovery of archeological features during soil-disturbing activities is proposed. This would result in a less than

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[30] San Francisco Planning Department, *Memorandum to File re: Pier 92 Modernization and Plant Replacement Project (2024-005922ENV),* August 19, 2025.

[31] Kari Hervey-Lentz, *Cultural Resources Review Memo for the Pier 92 Project*, December 11, 2025, Cultural Resources Team, Environmental Planning. On file at the San Francisco Planning Department.

significant impact with implementation with mitigation measures. This mitigation measure also addresses the concerns of the tribes that consulted on this project, as discussed below in the tribal cultural resources section.

Mitigation Measure M-CR-2: Procedures for Discovery of Archeological Resources

Construction Crew Archeological Awareness. Prior to any soil-disturbing activities being undertaken, a qualified archeologist shall conduct a brief onsite archeological awareness training session that describes the types of resources that might be encountered and how they might be recognized, along with requirements and procedures for work stoppage, resource protection, and notification in the event of a potential archeological discovery. The archeologist or the project sponsor also shall distribute the department's "ALERT" wallet card and the department's "ALERT" sheet, which summarizes stop-work requirements and provides necessary contact information for the planning department's archeological staff and project sponsor. The project sponsor must provide the environmental review officer (ERO) with a signed affidavit confirming that all relevant personnel involved in soil-disturbing activities, including machine operators, field crews, pile drivers, supervisory personnel, etc., have received the sheet. The qualified archeologist shall repeat the training at intervals during construction, as determined necessary by the ERO, including when new construction personnel start work and prior to periods of soil-disturbing work when the project archeologist will not be on site.

Cultural Sensitivity Training. In addition to and, if possible, concurrently with the archeological awareness training, the project sponsor shall ensure that a local Native American representative is afforded the opportunity to provide Native American cultural resources sensitivity training to all construction personnel.

Stop Work and Notification Upon Discovery. Should any indication of an archeological resource be encountered during any soil-disturbing activity of the project, the project head foreman and/or project sponsor shall immediately notify the ERO and immediately suspend any soil-disturbing activities in the vicinity of the discovery until the ERO has determined what additional measures should be undertaken.

Discovery Identification, Evaluation, and Treatment Determination. If the ERO determines that an archeological resource may be present within the project site, the project sponsor shall retain the services of an archeological consultant from the qualified archeological consultant list maintained by the planning department. The archeological consultant shall advise the ERO as to whether the discovery is an archeological resource or if it retains sufficient integrity and is of potential scientific/historical/cultural significance. If an archeological resource is present, the archeological consultant shall identify, document, and evaluate the archeological resource. The archeological consultant shall make a recommendation as to what action, if any, is warranted. Based on this information, the ERO may require, if warranted, specific additional treatments to be implemented by the project sponsor.

Treatment might include preservation in situ of the archeological resource, an archeological monitoring program, an archeological testing program, and/or an archeological interpretation program. If an archeological interpretive, monitoring, and/or testing program is required, it shall be consistent with the environmental planning division guidelines for such programs and shall be implemented immediately. The ERO may also require that the project sponsor immediately

implement a site security program if the archeological resource is at risk from vandalism, looting, or other damaging actions.

Consultation with Descendant Communities. On discovery of an archeological site associated with California Native American tribes that are traditionally and culturally affiliated with the geographic area of the project, the Overseas Chinese, or other potentially interested descendant group, an appropriate representative of the descendant group and the ERO shall be contacted. The representative of the descendant group shall be given the opportunity to monitor archeological field investigations of the site and offer recommendations to the ERO regarding appropriate archeological treatment of the site, of recovered data from the site, and, if applicable, any interpretative treatment of the associated archeological site. The appropriate representative of the descendant group, at their discretion, shall provide cultural sensitivity training to all project contractors. The ERO and project sponsor shall work with the tribal representative or other representatives of descendant communities to identify the scope of work to fulfill the requirements of this mitigation measure, which may include participation in preparation and review of deliverables (e.g., plans, interpretive materials, artwork). Representatives shall be compensated for their work, as identified in the agreed-upon scope of work. A copy of the archeological resources report (ARR) shall be provided to the representative of the descendant group.

Archeological Data Recovery Plan. An archeological data recovery program shall be conducted in accordance with an archeological data recovery plan (ADRP) if all three of the following apply: 1) a resource has potential to be significant, 2) preservation in place is not feasible, and 3) the ERO determines that an archeological data recovery program is warranted. The project archeological consultant, project sponsor, and ERO shall meet and consult on the scope of the ADRP. The archeological consultant shall prepare a draft ADRP that shall be submitted to the ERO for review and approval. The ADRP shall identify how the proposed data recovery program will preserve the significant information the archeological resource is expected to contain. That is, the ADRP will identify what scientific/historical research questions are applicable to the expected resource, what data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. Data recovery, in general, should be limited to the portions of the historical property that could be adversely affected by the proposed project. Destructive data recovery methods shall not be applied to portions of the archeological resources if nondestructive methods are practical.

The scope of the ADRP shall include the following elements:

- *Field Methods and Procedures*. Descriptions of proposed field strategies, procedures, and operations.
- *Cataloging and Laboratory Analysis*. Description of selected cataloging system and artifact analysis procedures.
- *Discard and Deaccession Policy*. Description of and rationale for field and post-field discard and deaccession policies.
- *Security Measures*. Recommended security measures to protect the archeological resource from vandalism, looting, and non-intentionally damaging activities.
- *Final Report*. Description of proposed report format and distribution of results.

- *Curation*. Description of the procedures and recommendations for the curation of any recovered data having potential research value, identification of appropriate curation facilities, and a summary of the accession policies of the curation facilities.

Human Remains and Funerary Objects. The treatment of human remains and funerary objects discovered during any soil-disturbing activity shall comply with applicable state and federal laws. This shall include immediate notification of the Office of the Chief Medical Examiner of the City and County of San Francisco (Medical Examiner). The ERO also shall be notified immediately upon the discovery of human remains. In the event of the Medical Examiner's determination that the human remains are Native American remains, the Medical Examiner shall notify the California Native American Heritage Commission (NAHC), which will appoint a Most Likely Descendant (MLD). The MLD will complete his or her inspection of the remains and make recommendations or preferences for treatment within 48 hours of being granted access to the site (PRC section 5097.98[a]).

The landowner may consult with the project archeologist and project sponsor and shall consult with the MLD and ERO on preservation in place or recovery of the remains and any scientific treatment alternatives. The landowner shall then make all reasonable efforts to develop an agreement with the MLD as expeditiously as possible for the treatment and disposition, with appropriate dignity, of human remains and funerary objects (as detailed in CEQA Guidelines section 15064.5[d]). Per PRC 5097.98 (b)(1), the agreement shall address and take into consideration, as applicable to the degree consistent with the wishes of the MLD, the appropriate excavation, removal, recordation, scientific analysis, custodianship prior to reinterment or curation, and final disposition of the human remains and funerary objects. If the MLD agrees to scientific analyses of the remains and/or funerary objects, the archeological consultant shall retain possession of the remains and funerary objects until completion of any such analyses unless otherwise specified in the agreement, after which the remains and funerary objects shall be reinterred or curated as specified in the agreement.

Both parties are expected to make a concerted and good faith effort to arrive at an agreement, consistent with the provisions of PRC 5097.98. However, if the landowner and the MLD are unable to reach an agreement, the landowner, ERO, and project sponsor shall ensure that the remains and/or mortuary materials are stored securely and respectfully until they can be reinterred on the property, with appropriate dignity, in a location not subject to further or future subsurface disturbance, consistent with state law.

Treatment of historic-period human remains and associated or unassociated funerary objects discovered during any soil-disturbing activity shall follow protocols laid out in the project's archeological treatment documents and in any related agreement established between the Medical Examiner and the ERO. The project archeologist shall retain custody of the remains and associated materials while any scientific study scoped in the treatment document is conducted. The remains shall then be curated or respectfully reinterred by arrangement on a case-by case-basis.

Cultural Resources Public Interpretation Plan. The project archeological consultant shall submit a cultural resources public interpretation plan (CRPIP) if a significant archeological resource is discovered during a project. As directed by the ERO, a qualified design professional with demonstrated experience in displaying information and graphics to the public in a visually interesting manner, local artists, or community group may also be required to assist the project archeological consultant in preparation of the CRPIP. If the resource to be interpreted is a tribal cultural resource (TCR), the CRPIP shall be prepared in consultation with and developed with the

participation of Ohlone tribal representatives. The CRPIP shall describe the interpretive product(s), locations or distribution of interpretive materials or displays, the proposed content and materials, the producers or artists of the displays or installation, and a long-term maintenance program. The CRPIP shall be sent to the ERO for review and approval. The CRPIP shall be implemented prior to project completion.

Curation. Significant archeological collections and paleoenvironmental samples of future research value shall be permanently curated at an established curatorial facility or Native American cultural material shall be returned to local Native American tribal representatives at their discretion. The facility shall be selected in consultation with the ERO. Upon submittal of the collection for curation, the sponsor or archeologist shall provide a copy of the signed curatorial agreement to the ERO.

With implementation of **Mitigation Measure M-CR-2**, the impact on significant archeological resources from construction of the project would be ***less than significant with mitigation***.

Impact CR-3: The proposed project could disturb human remains, including those interred outside of formal cemeteries. *(Less than Significant with Mitigation)*

As discussed above, the project site is situated on modern fill, and ground disturbance would not extend more than 5 feet below the modern grade. There are no known or suspected human remains, including those interred outside of formal cemeteries, located in the immediate vicinity of the project site. In the unlikely event that human remains are encountered during construction, any inadvertent damage to human remains would be considered a significant impact. Mitigation Measure M-CR-2 includes the required procedures to address, protect, and treat human remains should any be discovered during construction. With implementation of **Mitigation Measure M-CR-2: Procedures for Discovery of Archeological Resources**, the project's impacts on human remains would be ***less than significant with mitigation***.

Impact C-CR-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact related to cultural resources. *(No Impact)*

Cumulative development projects within a 1,000-meter radius of the project site are identified in draft EIR p. 3-8, and mapped in Figure 3-1, Cumulative Projects within a 1,000-Meter Radius of the Project Site, p. 3-12. There are no built environment historical resources on the project site, and no known built-environment cultural resources would be affected by the project. Therefore, the project would not have the potential to contribute to cumulative impacts on built-environment historical resources.

The geographic context for archeological resources and human remains is generally confined to the project site and projects in the immediate vicinity of the project site that might affect resources that also could be affected by the project. One project (Pier 94 Grassland Meadow Enhancements Project) would overlap or be directly adjacent to the project site. However, this project does not have planned excavation or grading activities that could affect buried archeological resources or human remains. Therefore, the Pier 94 project would have no impact and could not combine with the proposed project and result in a cumulative impact. The proposed project would have no cumulative impact on buried cultural resources, and no mitigation measures are required.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
5. TRIBAL CULTURAL RESOURCES. Would the project:					
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe and:					
i) Listed in or eligible for listing in the California Register of Historical Resources, or a local register of historical resources, as defined in Public Resources Code section 5020.1(k), or	☐	☐	☒	☐	☐
ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☒	☐	☐	☐

REGULATORY SETTING

In September 2014, the California Legislature passed Assembly Bill (AB) 52, which sets forth requirements for public agency consultation with California Native American tribes and requires CEQA analyses to consider impacts on TCRs (PRC sections 21080.3.1, 21080.3.2, and 21082.3). Lead agencies are required to analyze project impacts on TCRs separately from archeological resources (PRC sections 21074 and 21083.09). A TCR is defined in PRC section 21074 as a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe and:

1. Included or determined to be eligible for inclusion in the California Register or a local register of historical resources (see Section E.4, Cultural Resources), as defined in PRC section 5020.1(k), or
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in PRC section 5024.1(c). In applying the criteria set forth in PRC section 5024.1(c), the lead agency will consider the significance of the resource to a California Native American tribe.

Based on Native American consultation undertaken since 2015, with the passage of Assembly Bill 52 and the addition of tribal cultural resources (TCRs) to CEQA review, all Native American archeological resources are determined to be TCRs. In addition, based on Native American consultation undertaken for the Housing

Element 2022 Update EIR,[32] the following locations are identified as culturally important to local Ohlone and, therefore, determined to be potential TCRs:

- Locations modeled as having high sensitivity for Native American archeological resources, confirming the previous Native American consultation;
- The shoreline and marsh zone associated with natural environmental change over the period between about 8,000 years ago and 170 years ago, including areas modeled as having high sensitivity for archeological resources that were submerged by the rising bay;
- Known historical locations of creek channels, ponds, marshes, and other wetlands; and
- The modern San Francisco Bay and ocean shoreline as well as the shores of remnant creek channels, lakes, and ponds that are characterized by above-ground water today.

TRIBAL CULTURAL RESOURCE ANALYSIS

Pursuant to CEQA section 21080.3.1(d), on August 20, 2025, the planning department contacted Native American tribal representatives and organizations for the City and County of San Francisco, providing a description of the project and notifying Native American tribal representatives of their ability to request consultation on the identification, presence, and significance of TCRs in the project vicinity. During the 30-day notification period, the planning department received requests for consultation from four tribal groups: the Amah Mutsun Tribal Band of Mission San Juan Bautista, the Indian Canyon Mutsun Band of Costanoan, the Muwekma Ohlone Tribe of the San Francisco Bay Area, and the Association of Ramaytush Ohlone. The planning department conducted consultation with these groups between August 21 and November 25, 2025.

A description of the environmental setting is presented in Section E.4, Cultural Resources. Descriptions of the precolonial context, cultural setting, and ethnographic context are also presented in Section E.4. As discussed above, the project has low potential to affect redeposited Native American archeological resources in the fill.

IMPACTS AND MITIGATION MEASURES

Impact TCR-1: The proposed project could cause a substantial adverse change in the significance of a tribal cultural resource, as defined in PRC section 21074. *(Less than Significant with Mitigation)*

Based on consultation with the above tribal groups, local Native American tribal groups agree that there is potential for submerged Native American archeological resources on the project site; however, ground-disturbing activities would not affect these resources. The tribal groups also agreed that there was low potential for redeposited Native American archeological resources in the fill that, if present, could be affected by project ground-disturbing activities. As noted above, based on Native American consultation, Native American archeological resources are considered to be potential TCRs. In addition, all of the tribal groups confirmed the cultural significance of both historical and modern waterways to the local Ohlone. Tribal groups did not identify any non-archeological TCRs within the project site.

A TCR is adversely affected when a project affects its significance, which would occur if such a resource were disturbed or destroyed. If a Native American archeological resource is found on the project site, the resource

[32] San Francisco Planning Department, *Housing Element 2022 Update EIR*, Planning Department Case No. 2019-016230ENV and State Clearinghouse No. 2021060358, https://sfplanning.org/environmental-review-documents?title=Housing+Element&field_environmental_review_categ_target_id=212&items_per_page=10.

would be considered a potential TCR, and construction damage to the resource would be a significant impact. As discussed in Section E.4, Cultural Resources, of this initial study, the study area for the project has low sensitivity for Native American archeological resources within the fill. However, if the proposed project were to encounter Native American archeological resources, impacts on these resources would be considered a significant impact.

Implementation of **Mitigation Measure M-CR-2: Procedures for Discovery of Archeological Resources**, as described in Section E.4, Cultural Resources, above, would require worker awareness training, which would include distribution of the planning department's "ALERT" sheet for appropriate personnel. Training would be provided to workers by a qualified archeologist; TCR sensitivity training would be provided by a local Native American representative, as requested by tribal representatives for this project during consultation. In addition, if a TCR is identified during construction activities, **Mitigation Measure M-CR-2: Procedures for Discovery of Archeological Resources**, identifies appropriate treatment for the resources, including consultation with Native American representatives, Native American monitoring, and public interpretation of the resource in coordination with Native American representatives. Therefore, **Mitigation Measure M-CR-2: Procedures for Discovery of Archeological Resources**, would reduce impacts to ***less than significant with mitigation***.

Impact C-TCR-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact on tribal cultural resources. *(No Impact)*

The geographic context for cumulative TCR impacts is generally confined to the project site and projects in the immediate vicinity of the project site that might affect resources that also could be affected by the project. One cumulative project (Pier 94 Grassland Meadow Enhancements Project) would overlap with or be directly adjacent to the project site. However, this project does not have planned excavation or grading activities that could affect TCR. Therefore, the Pier 94 project would have no impact and could not combine with the proposed project and result in a cumulative impact. The proposed project would have no cumulative impact on TCR, and no mitigation measures are required.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
6. TRANSPORTATION AND CIRCULATION. Would the project:					
a) Involve construction that would require a substantially extended duration or intensive activity, with effects that would create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit?	☐	☐	☒	☐	☐
b) Create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations?	☐	☐	☒	☐	☐
c) Interfere with accessibility of people walking or bicycling to and from the project site, as well as adjoining areas, or result in inadequate emergency access?	☐	☐	☒	☐	☐
d) Substantially delay public transit?	☐	☐	☒	☐	☐
e) Cause substantial additional vehicle miles traveled or substantially induce additional automobile travel by increasing physical roadway capacity in congested areas (e.g., by adding new mixed-flow travel lanes) or by adding new roadways to the network?	☐	☐	☒	☐	☐
f) Result in a loading deficit, with secondary effects that would create potentially hazardous conditions for people walking, bicycling, or driving or substantially delay public transit?	☐	☐	☒	☐	☐
g) Result in a substantial vehicular parking deficit, with secondary effects that would create potentially hazardous conditions for people walking, bicycling, or driving; interfere with accessibility for people walking or bicycling or result in inadequate access for emergency vehicles; or substantially delay public transit?	☐	☐	☒	☐	☐

This transportation analysis was prepared in accordance with the 2019 Transportation Impact Analysis Guidelines for Environmental Review[33] (SF transportation guidelines). It examines the transportation-related impacts of the proposed project with respect to potentially hazardous conditions, accessibility, public transit delay, vehicle miles traveled (VMT), loading, and parking. The proposed project's transportation-related

[33] San Francisco Planning Department, *Transportation Impact Analysis Guidelines,* http://default.sfplanning.org/publications_reports/TIA_Guidelines.pdf.

construction impacts were determined not to require detailed analysis, as described below. The travel demand memorandum prepared for the proposed project provides supporting information.[34]

The planning department's SF transportation guidelines set forth screening criteria for the types of construction activities that typically do not result in significant construction-related transportation effects, based on project site context as well as construction duration and magnitude. The proposed project's construction activities would meet the SF transportation guidelines' screening criteria, based on an assessment of the temporary construction activities, with a duration of about seven months; the level of intensity of the activities; the volume of excavated material that would be removed from the site (i.e., less than 20,000 cubic yards); and the location of the project site along Amador Street, which has a low number of vehicles, as well as people walking and bicycling, and no public transit service (see EIR Chapter 2, Project Description and Site Context, for full breakdown of construction activities and schedule). This indicates that construction of the proposed project would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; interfere with emergency access or accessibility for people walking or bicycling; or substantially delay public transit. For these reasons, it was determined that the proposed project would result in less-than-significant construction-related transportation impacts under existing-plus-project and cumulative conditions. No further analysis of construction impacts is provided.

Transportation Setting

Roadways. The transportation characteristics of streets adjacent to and near the Pier 92 facility are described below, including their geographic extent and the general plan, Better Streets Plan, and Vision Zero High-Injury Network[35] designation.

Amador Street is an east–west roadway that extends approximately 0.5 mile east from Cargo Way near Third Street to Pier 92 where it turns northwest–southwest and continues for approximately 0.4 mile to Jennings Street. The east–west portion of Amador Street provides direct access to two concrete ready-mix facilities, along with Pier 92, while the northwest–southwest segment provides access to the Pier 94 wetlands as well as Piers 94 and 96. The two-way street has one travel lane in each direction. The street segment between Cargo Way and Pier 92 is currently being reconstructed, resurfaced, and landscaped to address its poor condition, improving efficiency of goods movement and enhancing roadway safety. In general, on-street parking is prohibited on the north side of the street between Cargo Way and Pier 92, while angled parking is intermittently permitted in the off-shoulder areas on the south side of the street; no on-street parking is available between Pier 92 and Jennings Street. Amador Street is owned by the Port, but access is not restricted. Amador Street does not meet public works design standards (e.g., widths, curbs, fire hydrants, paving, sidewalks) and therefore has not been formally adopted by the public works department. Consequently, Amador Street does not receive maintenance by public works.[36]

Cargo Way is a northwest–southeast roadway that extends approximately 0.75 mile east from Third Street (Arthur Avenue west of Third Street) to Jennings Street. The two-way street has two travel lanes in each

[34] Adavant Consulting/LCW Consulting, *Technical Memorandum – Pier 92 Modernization Project, Project Travel Demand*, October 3, 2025 (see Appendix D).

[35] Vision Zero is a city policy adopted in 2014. It aims to reduce traffic fatalities to zero by 2024 through engineering, education, and enforcement. Street segments that have a high number of fatalities and severe injuries have been designated as part of the Vision Zero High-Injury Network. The High-Injury Network map identifies streets where the most traffic safety investment should be focused to have the greatest impact on reducing fatalities and severe injuries. San Francisco Department of Public Health, High-Injury Network, https://sfgov.maps.arcgis.com/apps/webappviewer/index.html?id=b2743a3fc0b14dd9814cf6668fc34773, accessed October 15, 2025.

[36] Amador Street is considered an "unaccepted" street, a public right-of-way that has not been adopted as a city or state road (https://sfpublicworks.org/services/acceptance).

direction; a landscaped median separates the lanes. Parking is prohibited on both sides of the street. Active railroad tracks that serve adjacent properties run parallel to and north of the street from its intersection with Third Street. The general plan designates Cargo Way as a freight traffic route, while the Better Streets Plan identifies Cargo Way as an industrial street.

Third Street is the principal north–south arterial in the southeast part of San Francisco, extending from U.S. 101 at Bayshore Boulevard to its intersection with Market Street in downtown San Francisco. It serves as a through street and provides access to the industrial areas north and east of U.S. 101. In the project vicinity, Third Street has two travel lanes in each direction. The T Third line light rail operates in an exclusive median right-of-way, with the exception of the segment between Kirkwood and Thomas avenues where the light rail shares a travel lane with vehicles. Protected travel lanes with an exclusive turn signal are provided at signalized intersections; left turns are permitted, including southbound left turns at Cargo Way. On-street parking is generally prohibited, with some exceptions in the vicinity of the project site. The segment of Third Street over the Islais Creek Channel is referred to as the Islais Creek Bridge. The general plan designates Third Street as a transit preferential street, a citywide pedestrian network street, a neighborhood commercial pedestrian street, and a freight traffic route. In the vicinity of the project site, the Better Streets Plan identifies Third Street as an industrial street. Third Street south of 26th Street is included in the San Francisco High-Injury Network.

Illinois Street is a north–south roadway east of Third Street that extends between 16th Street and the intersection of Cargo Way and Amador Street. The two-way street has one travel lane in each direction. The segment of Illinois Street over the Islais Creek Channel is referred to as the Illinois Street Bridge. On-street parking is generally permitted on Illinois Street north of Marin Street. The Better Streets Plan identifies Illinois Street as an industrial street south of 20th Street.

Traffic Volumes. Table 1 presents vehicle counts on roadway segments near the project site. Counts of vehicular traffic, as well as people walking and bicycling, were conducted at the following intersections on Tuesday, April 29, 2025, during the peak traffic periods of 7 a.m. to 9 a.m. and 3 p.m. to 5 p.m.: Illinois Street/Amador Street/Cargo Way, Third Street/Cargo Way, and Mendell Street/Cargo Way. In addition, 24-hour traffic volume/vehicle classification counts were collected on Amador Street east of the intersection of Illinois Street/Amador Street/Cargo Way. As shown in Table 1, traffic volumes on the roadway segments are similar during both the morning and afternoon peak hours. Peak-hour traffic volumes are lowest on Amador Street and Cargo Way east of Mendell Street, with fewer than 300 vehicles per hour. Traffic volumes on Illinois Street are higher, with most peak-hour traffic (between approximately 410 and 440 vehicles per hour) traveling to and from Cargo Way (between 70 and 85 percent) and Amador Street (between 10 and 30 percent). Peak-hour traffic volumes are highest on Third Street, with between approximately 770 and 1,050 vehicles per hour.

Pedestrian Facilities. Amador Street provides vehicular access between the various nearby industrial facilities. It is not intended for people walking; therefore, pedestrian facilities such as sidewalks and/or crosswalks are not provided on Amador Street. Cargo Way has a sidewalk on the south side of the street and a discontinuous sidewalk on the north side of the street. Third Street has sidewalks on both sides of the street. Illinois Street has a sidewalk on the west side of the street between Cargo Way and the Illinois Street Bridge, a protected pedestrian and bicycle pathway on the bridge, and a sidewalk/protected walkway on the west side of the street between the bridge and Marin Street. North of Marin Street, there are sidewalks on both sides of Illinois Street.

Table 1. Existing (April 2025) Traffic Volumes on Roadway Segment for A.M. and P.M. Peak Hours

Roadway Segment	A.M. Peak Hour[a]			P.M. Peak Hour[b]		
	EB/NB	WB/SB	Total	EB/NB	WB/SB	Total
Amador Street east of Illinois Street	49	71	120	33	67	100
Illinois Street north of Amador St/Cargo Way	202	208	410	236	205	441
Cargo Way east of Mendell Street	156	106	262	157	129	286
Cargo Way west of Mendell Street	255	245	500	267	296	563
Third Street north of Amador St/Cargo Way	520	404	924	598	448	1,046
Third Street south of Amador St/Cargo Way	445	322	767	489	386	875

Source: Traffic Counts Plus, April 29, 2025 (see Appendix D).

Notes:

a. The a.m. peak hour is generally between 7 a.m. and 8 a.m. during the 7 a.m. to 9 a.m. peak period.

b. The p.m. peak hour is generally between 3 p.m. and 4 p.m. during the 3 p.m. to 5 p.m. peak period.

NB = northbound; SB = southbound; EB = eastbound; WB = westbound

Bicycle Facilities. There are no bicycle facilities[37] adjacent to the project site. Cargo Way has a class IV and a class II eastbound bicycle lane between Third Street and the intersection of Illinois Street/Amador Street/Cargo Way and a two-way protected bicycle lane between the intersection of Illinois Street/Amador Street/Cargo Way and Jennings Avenue. Illinois Street has class II bicycle lanes each way north and south of the Illinois Street Bridge, except for the class IV protected lane in the southbound direction between Marin Street and the Illinois Street Bridge. There is a class I facility on the Illinois Street Bridge. There is a class III facility with sharrows on Third Street south of Cargo Way.

Public Transit. There is no public transit service on Amador Street adjacent to the project site. The T Third Street light rail line and the 15 Bayview Hunters Point Express bus route operate on Third Street. The 19 Polk and 44 O'Shaughnessy bus routes operate on Evans Avenue, about 0.5 mile south of the project site. There are no regional bus routes in the vicinity of the project site. Caltrain operates completely within an exclusive right-of-way; the nearest station (Oakdale) is about 1.5 miles away.

Emergency Access. The nearest fire station to the project site is Station 25 at 3305 Third Street, north of Cargo Way and about 0.5 mile west of the project site. The project site is in the Bayview police station service area, with a station at 201 Williams Avenue, about 1.5 miles southwest of the project site. Emergency vehicle access to the project site is via Amador Street.

37 Class I bikeways are bike paths with exclusive right-of-way for use by bicyclists. Class II bikeways are bike lanes striped within the paved areas of roadways and established for the preferential use of bicycles. Class III bikeways are signed bike routes that allow bicycles to share the travel lane with vehicles. Class IV bikeways, sometimes referred to as cycle tracks, are for the exclusive use of bicycles and physically separated from motor traffic with a vertical feature. The separation may include, but is not limited to, grade separation, flexible posts, inflexible barriers, or on-street parking.

Loading Facilities. There are no marked on-street commercial vehicle loading spaces or passenger loading zones[38] adjacent to the project site or along Amador Street. Freight loading activities associated with the adjacent industrial uses generally occur off-street within the business sites.

Project Travel Demand

Project travel demand refers to the number, type, and common destinations of new trips that people would take to and from the project and is used in the impact analysis following this section. This section presents the approach to determining travel demand for the project. First, the section presents information and conditions used to define existing conditions, and two increased market demand conditions known as the project reasonable peak condition and a project maximum condition that could be met under the facility's permit application requested from the Air District. Then, the section presents total daily and peak hour project vehicle trips, and the assignment of the net-new project vehicle trips that could occur under these conditions to the local roadway network. See Appendix D for additional details on the travel demand analysis.

Approach

The proposed project would reconstruct and modernize the existing sand processing facility at Pier 92 but would not change the essential nature of sand processing activities at the facility. The amount of sand processed at the Pier 92 facility and transported offsite varies by year and day and is highly dependent on local market demand (i.e., construction activities within San Francisco and in proximity to the site in San Mateo County). It is not related to the proposed project's physical changes at the project site. As part of the proposed project, the project sponsor has applied for a permit from the Air District to receive and process a maximum of 800,000 tons of sand during any consecutive 12-month period, with a maximum truck throughput of 300 trucks per day (i.e., 600 truck trips: 300 inbound and 300 outbound trucks per day). For purposes of a conservative environmental impact analysis, this review assesses the increased levels of market demand that could be met under the facility's permit application requested from the Air District. Thus, the proposed project travel demand analysis estimates the total and net-new vehicle travel demand that could occur due to increased market demand, as described below.

The travel demand estimates uses the following information to determine the increase in the number of project-generated vehicles on a daily and peak hour basis: existing vehicle counts and operating characteristics (e.g., number of employees, hours of operation) of the Pier 92 facility, historical annual sand processing and truck throughput data for the past 24 years, and Martin Marietta's Air District permit application for annual maximum sand processing and truck throughput. The travel demand analysis assumes that all trips to and from the Pier 92 facility would be made by trucks transporting sand or by autos, pickups and vans driven by employees and visitors.

Definition of Existing Conditions and Project Reasonable Peak and Project Maximum Conditions

The following presents the daily truck and employee assumptions used to define existing conditions and the two increased demand market conditions.

[38] On-street commercial vehicle loading spaces are provided to allow commercial vehicles, typically trucks and service vehicles, to park along the curb and unload or load goods. These spaces are frequently used by building service vehicles, contractors, and delivery vehicles at buildings without off-street facilities. Passenger loading/unloading zones (i.e., white zones) provide a place to load and unload passengers for adjacent businesses and residences. These are intended for quick passenger drop-off and pickup.

Existing Conditions. Annual sand processing data for the past 24 years indicate that the current activity at the Pier 92 facility represents the lower end of the cycle for the current period, based on historical data distribution.[39] Thus, for purposes of environmental review, the travel demand analysis establishes existing conditions from the facility's activity over the most recent 5-year operating period (2020–2024) and not the current activity or the maximum activity achieved over the facility's history. The existing condition assumes a truck throughput at the Pier 92 facility of 68 trucks per day, which represents a value that encompasses two-thirds[40] of the daily truck volumes recorded traveling to and from the facility over the past 5-year operating period.

Project Conditions. The maximum truck throughput of 300 daily trucks under the Air District permit would be reached only when the market demand for processed sand increases substantially from existing levels. Thus, the travel demand analysis develops two possible increased market demand conditions to assess the potential increase in truck throughput at the Pier 92 facility: a project reasonable peak condition and a project maximum condition. The project reasonable peak and the project maximum conditions assume the following:

- The **project reasonable peak condition** represents conditions during which the number of daily trucks processed through the facility increases to 240 trucks per day yet does not require changing typical operating procedures at the facility. This condition reflects about 80 percent of the maximum daily truck throughput that would be permitted under the Air District permit application.
- The **project maximum condition** represents the maximum daily truck throughput that would be permitted by the Air District (i.e., 100 percent of the daily maximum of 300 trucks). For purposes of the impact analysis, three additional daily personnel were assumed to be at the facility during the project maximum condition.

Both the project reasonable peak and project maximum conditions represent conservative analysis scenarios for purposes of environmental review because the maximum daily truck demand reported over the past 5-year period was 203 trucks on only one day in March 2020, and the two highest daily truck demand totals reported since 2016 were 264 and 219 trucks per day, both on single days in October and December 2016, respectively. In addition, the 25-year historical data show that the facility has never reached the proposed maximum daily truck throughput of 300 trucks. Thus, the project's reasonable peak condition represents a market demand condition that would most likely occur very infrequently; while the likelihood of the facility operating under the project maximum condition would be extremely rare.

Daily and Peak Hour Vehicle Trip Generation for Existing Conditions and Project Reasonable Peak and Project Maximum Conditions

The following presents the total daily and peak hour project vehicle trips and the number of inbound versus outbound vehicle trips at the facility by vehicle type for existing conditions and for the project reasonable peak and project maximum conditions.

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[39] During 24-hour traffic volume counts at the facility driveways on April 23 and 24, 2025, a maximum of 25 daily trucks that transported sand (i.e., 50 truck trips per day [25 inbound and 25 outbound]) accessed the Pier 92 facility. In addition to the trucks transporting sand, a water-sprinkler tank truck and road-sweeper truck entered and exited the site on a daily basis. The data were then compared to the daily truck count data for the past 5-year period (2020–2024), which confirmed that the 2025 field counts represented the low end of the Pier 92 facility's typical activity (i.e., 85 percent of the recorded daily truck counts over the past five years were higher than 25).

[40] The frequency distribution of daily truck flow at Pier 92 is an asymmetrical function. The mean (average) value for the five-year operating period is 56 round-trip truck trips per day, which encompasses 55 percent of the total sample cases; therefore, almost half (45 percent) of the cases would not be captured by this value if it were to be used as representative of the existing baseline condition. Thus, in order to select a value that includes more sample cases than the mean, a demand of 68 daily round-trip truck trips was selected, which includes two-thirds of the cases.

Table 2 summarizes daily truck throughput and the number of employees at the Pier 92 facility as well as the total number of daily and peak-hour vehicle trips under existing conditions and project reasonable peak and maximum peak conditions.

Table 2. Daily and A.M. and P.M. Peak Hour Trip Generation for Existing, Project Reasonable Peak and Project Maximum Conditions

Analysis Condition	Daily		Total Daily Vehicle Trips[a]	Total Peak Hour Vehicle Trips[a]	
	Trucks	Employees		A.M.	P.M.
Existing Conditions [b]	68	5	154	23	0
Project Reasonable Peak Conditions	240	6	502	41	41
Project Maximum Conditions	300	9	634	44	44

Source: Technical Memorandum – Pier 92 Modernization Project, Project Travel Demand, October 2025 (see Appendix D).

Notes:

a. Includes inbound and outbound trips of trucks, auto/vans by employees and visitors.

b. Existing conditions reflect a truck throughput at the Pier 92 facility of 68 trucks per day, which represents two-thirds of the daily truck throughput recorded over the 5-year period between 2020 and 2024.

Existing Conditions. As shown in Table 2, under existing conditions, there are about 154 daily vehicle trips and 23 vehicle trips during the a.m. peak hour of activity at the facility. As described above, these conditions reflect a representative day over the past 5-year period with about 68 trucks traveling to and from the facility per day. The facility currently operates between 5 a.m. and 3 p.m.; therefore, there are no vehicles traveling to and from the facility during the p.m. peak commute period (4 p.m. to 6 p.m.). If market demand for processed sand remains similar to the demand from the past five years, these conditions would also reflect typical (i.e., non-peak processed sand demand) conditions with implementation of the proposed project.

Project Reasonable Peak Conditions. Under the project reasonable peak conditions (i.e., throughput of 240 trucks per day), there would be a total of 502 daily vehicle trips (including employees and visitors). Because the maximum number of trucks per hour that could be loaded and processed in a sustained manner under existing operating procedures is about 12 trucks per hour (i.e., assuming the existing processing rate of about five minutes per truck), the operating hours at the facility would need to be extended from 10 hours (i.e., 5 a.m. to 3 p.m.) under existing conditions to about 20 hours (e.g., 4 a.m. to midnight) under the project reasonable peak condition. In addition, due to the potential for uneven fluctuations in the arrival of trucks at the facility, it is likely that, at peak demand times, a second truck loader and loading lane might need to be provided during peak demand times. Thus, with these assumptions, under the project reasonable peak conditions, there would be a total of 41 vehicle trips entering and exiting the Pier 92 facility during both the a.m. and p.m. peak hours.

Project Maximum Conditions. Under the project maximum conditions (i.e., throughput of 300 trucks per day), there would be 634 daily vehicle trips. Similar to project reasonable peak conditions, the hours of operation at the Pier 92 facility would need to be extended to close to 24 hours, and a second truck loader and loading lane would need to be provided during peak demand times. Therefore, with these assumptions, under the project maximum conditions, there would be a total of 44 vehicle trips entering and exiting the Pier 92 facility during both the a.m. and p.m. peak hours.

Table 3 presents Pier 92 facility vehicle trips by direction and vehicle type under existing a.m. and p.m. peak-hour conditions as well as project reasonable peak and project maximum conditions. In addition, Table 3 presents the net change in vehicle trips between existing conditions and project reasonable peak conditions as well as between existing conditions and project maximum conditions. Under project reasonable peak conditions, compared to existing conditions, there would be an increase of 18 vehicle trips (eight inbound and 10 outbound) during the a.m. peak hour and an increase of 41 vehicle trips (21 inbound and 20 outbound) during the p.m. peak hour. Under project maximum conditions, compared to existing conditions, there would be an increase of 21 vehicle trips (10 inbound and 11 outbound) during the a.m. peak hour and an increase of 44 vehicle trips (23 inbound and 21 outbound) during the p.m. peak hour.

Table 3. Vehicle Trip Generation by Direction and Vehicle Type for A.M. and P.M. Peak Hours for Existing, Project Reasonable Peak, and Project Maximum Conditions

Analysis Condition/Vehicle Type	A.M. Peak Hour			P.M. Peak Hour		
	Inbound	Outbound	Total	Inbound	Outbound	Total
Existing Conditions [a]						
Trucks	11	9	20	0	0	0
Autos/pickups/vans	2	1	3	0	0	0
Total	**13**	**10**	**23**	**0**	**0**	**0**
Project Reasonable Peak Conditions						
Trucks	18	18	36	18	18	36
Autos/pickups/vans	3	2	5	3	2	5
Total	**21**	**20**	**41**	**21**	**20**	**41**
Net Change Compared to Existing Conditions	*8*	*10*	*18*	*21*	*20*	*41*
Project Maximum Conditions						
Trucks	19	19	38	19	19	38
Autos/pickups/vans	4	2	6	4	2	6
Total	**23**	**21**	**44**	**23**	**21**	**44**
Net Change Compared to Existing Conditions	*10*	*11*	*21*	*23*	*21*	*44*

Source: Technical Memorandum – Pier 92 Modernization Project, Project Travel Demand, October 2025 (see Appendix D).

Note:

[a] Existing conditions reflect a truck throughput at the Pier 92 facility of 68 trucks per day, which represents two-thirds of the daily truck throughput recorded over the 5-year period between 2020 and 2024.

Assignment of Project Vehicles to Local Roadway Network

Table 4 presents the assignment of total a.m. and p.m. peak-hour vehicle trips presented in Table 3 to the roadway network near Pier 92. In addition, for project reasonable peak and project maximum conditions, Table 4 presents the net change in traffic volume from existing conditions. Under both project reasonable peak and project maximum conditions, the greatest increase in a.m. and p.m. peak-hour volumes would occur on Amador Street and on Illinois Street because a substantial portion of the additional trucks under

both conditions would be to or from the two adjacent concrete ready-mix facilities on Amador Street or would be on Illinois and Cesar Chavez streets to access U.S. 101 and I-280, along with other destinations throughout the city.

Table 4. Traffic Volumes on Roadway Segments for A.M. and P.M. Peak Hours for Existing, Project Reasonable Peak, and Project Maximum Conditions

Roadway Segment/Analysis Condition	A.M. Peak Hour			P.M. Peak Hour		
	EB/NB	WB/SB	Total	EB/NB	WB/SB	Total
Amador Street East of Illinois Street						
Existing Conditions[a]	50	71	121	33	67	100
Project Reasonable Peak Conditions	53	74	127	40	72	112
Net Change[b] for Project Reasonable Peak Conditions Compared to Existing Conditions	3	3	6	7	5	12
Project Maximum Conditions	57	77	134	44	75	119
Net Change[b] for Project Maximum Conditions Compared to Existing Conditions	7	6	13	11	8	19
Illinois Street North of Amador Street/Cargo Way						
Existing Conditions[a]	222	213	435	250	208	458
Project Reasonable Peak Conditions	225	215	440	253	211	464
Net Change[b] for Project Reasonable Peak Conditions Compared to Existing Conditions	3	2	5	3	3	6
Project Maximum Conditions	227	217	444	255	213	468
Net Change[b] for Project Maximum Conditions Compared to Existing Conditions	5	4	9	5	5	10
Cargo Way East of Mendell Street						
Existing Conditions[a]	156	106	262	157	129	286
Project Reasonable Peak Conditions	157	107	264	158	130	288
Net Change[b] for Project Reasonable Peak Conditions Compared to Existing Conditions	1	1	2	1	1	2
Project Maximum Conditions	157	107	264	158	130	288
Net Change[b] for Project Maximum Conditions Compared to Existing Conditions	1	1	2	1	1	2
Cargo Way West of Mendell Street						
Existing Conditions[a]	255	245	500	267	296	563
Project Reasonable Peak Conditions	255	245	500	267	296	563
Net Change[b] for Project Reasonable Peak Conditions Compared to Existing Conditions	0	0	0	0	0	0

Roadway Segment/Analysis Condition	A.M. Peak Hour			P.M. Peak Hour		
	EB/NB	WB/SB	Total	EB/NB	WB/SB	Total
Project Maximum Conditions	255	245	500	267	296	563
Net Change[b] for Project Maximum Conditions Compared to Existing Conditions	0	0	0	0	0	0
Third Street North of Cargo Way						
Existing Conditions[a]	520	404	924	598	448	1,046
Project Reasonable Peak Conditions	520	405	925	598	450	1,048
Net Change[b] for Project Reasonable Peak Conditions Compared to Existing Conditions	0	1	1	0	2	2
Project Maximum Conditions	521	406	927	599	451	1,050
Net Change[b] for Project Maximum Conditions Compared to Existing Conditions	1	2	3	1	3	4
Third Street South of Cargo Way						
Existing Conditions[a]	445	322	767	489	386	875
Project Reasonable Peak Conditions	445	322	767	491	388	879
Net Change[b] for Project Reasonable Peak Conditions Compared to Existing Conditions	0	0	0	2	2	4
Project Maximum Conditions	446	322	768	492	388	880
Net Change[b] for Project Maximum Conditions Compared to Existing Conditions	1	0	1	3	2	5

Source: Adavant Consulting/LCW Consulting, October 2025 (see Appendix D).

Note:

a. Existing conditions reflect a truck throughput at the Pier 92 facility of 68 trucks per day, which represents two-thirds of the daily truck throughput recorded over the 5-year period between 2020 and 2024.

b. The sum of the vehicles shown in the rows specified as "net change" does not necessarily add up to the total number of peak hour vehicle trips generated by the project. This is because this table represents the project vehicle assignment where a single vehicle trip can be counted multiple times when traveling through multiple intersections on its way to or from the project site or not added to any intersection when not traveling through the primary routes to/from the project site.

IMPACTS AND MITIGATION MEASURES

Impact TR-1: The proposed project would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; interfere with accessibility for people walking or bicycling; or result in inadequate emergency access. *(Less than Significant)*

The proposed project would not involve any changes to the transportation network that would create potentially hazardous conditions or interfere with accessibility. The proposed project would gate the existing entry driveway into the facility, would close the existing exit driveway (i.e., from the existing truck scales), and reconfigure the existing driveway south of the existing facility that is currently used for wetlands access (i.e., the Parcel A – Addition 1 portion of the proposed project) as a new gated exit driveway for the facility. No other changes to the adjacent roadway network would be made.

The existing condition at the project site reflects 68 daily trucks traveling to and from the facility (136 daily truck trips [154 total vehicle trips including employees]), which represents about two-thirds of the daily number of trucks traveling to and from the facility during the past five years. Because modernization of the Pier 92 facility would not, in and of itself, generate new travel demand, the existing conditions described above also reflect conditions with implementation of the proposed project if market demand conditions remain similar to those during the past five years.

As described above, travel demand was calculated for two possible increased market demand conditions to assess the effects of increased truck throughput at Pier 92: a project reasonable peak condition and a project maximum condition. During the a.m. peak hour, the Pier 92 facility would generate 18 net-new vehicle trips (eight inbound and 10 outbound) above existing conditions under project reasonable peak conditions and 21-net-new vehicle trips (10 inbound and 11 outbound) under project maximum conditions. Because the facility would have longer operating hours under project reasonable peak and project maximum conditions, there would be new vehicles entering and exiting the facility during the p.m. peak hour (41 net-new vehicle trips under the project reasonable peak condition, and 44 net-new vehicle trips under the project maximum condition). Under both project reasonable peak and project maximum conditions, most of the net-new vehicle trips during the peak hours would be to and from the adjacent ready-mix concrete facilities on Amador Street. See Table 4 for the assignment of the net-new peak-hour volumes on roadway segments farther from the project site.

Driving and Public Transit Operations. The proposed project would not include any changes to the transportation network that could increase hazardous conditions for people driving in the project vicinity or for transit operations in the vicinity of the project site. The assessment of potentially hazardous conditions for people driving and public transit operations is as follows:

- The proposed project would include two driveways in locations similar to those for existing driveways serving the Pier 92 facility. The driveways would be designed to accommodate large-truck turning radius requirements (i.e., so a driver's view of other vehicles and people walking or bicycling on Amador Street would not be impaired). Thus, the proposed project's driveways would not create potentially hazardous conditions for people driving on Amador Street.
- With implementation of the proposed project, there would be about 300 feet between the entry gate and the front loader that fills trucks with sand. The 300 feet can accommodate a queue of about four or five trucks (300 feet divided by 50 to 65 feet per truck plus buffer distance between trucks), including the truck being loaded, within the project site. Thus, under typical non-peak conditions when daily truck throughput is at or less than 150 trucks, the project site would accommodate queues of trucks waiting to be loaded.

Under both the project reasonable peak and the project maximum conditions, consistent with current operating procedures at the Pier 92 facility on high-demand days, additional measures would be implemented to accommodate the increase in the number of trucks processed at the facility. These measures could include, as determined appropriate by facility operators for the anticipated daily truck volume, the following: expanding hours of operation, greater use of scheduling of truck arrivals, adding a second loader during peak demand periods (i.e., opening a second inbound truck loading lane within the site), adding personnel to assist truck drivers and loaders inside the facility, assigning flaggers along Amador Street to direct and facilitate incoming and exiting truck maneuvers, and assigning staging areas to enhance the truck arrival schedule. Consistent with current operating procedures, the type of measures that would be implemented would vary, depending on the anticipated daily truck demand. Thus, by adjusting operations

to accommodate increased daily truck throughput, truck queues would be maintained primarily within the project site under project reasonable peak and project maximum conditions. Any queues that would extend west on Amador Street would be managed so that driveways and operations at the CEMEX and Central Concrete ready-mix facilities would not be affected and queues would not create potentially hazardous conditions. Existing traffic on Amador Street is related primarily to the Pier 92 facility and the ready-mix facilities; therefore, no through traffic would be affected by queues on Amador Street. In addition, under project reasonable peak and the project maximum conditions, queues on Amador Street would not extend to Third Street (about 2,600 feet west of the project site) and therefore would not create potentially hazardous conditions on Third Street.

- Under both project reasonable peak and project maximum conditions, the number of trucks accessing the facility during the peak hours would increase by between 18 and 44 per hour. Most of the net-new vehicle trips would be trucks transporting sand from the Pier 92 facility to the adjacent ready-mix facilities on Amador Street, while the remaining net-new vehicle trips would be trucks traveling to and from Illinois Street to access Cesar Chavez Street, the I-280 and U.S. 101 freeway ramps, and arterials to reach destinations throughout the city. Very few net-new vehicles would travel via Amador Street south of the project site or Third Street north and south of Cargo Way. These trips would be primarily deliveries of sand for projects in the Hunters Point Shipyard and the Candlestick and Bayview neighborhoods. On Third Street, weight restrictions on large vehicles are currently in effect south of the project site; through trucks with a payload capacity of 5.5 tons[41] are prohibited between Jamestown and Jerrold avenues. Given that the average sand payload on trucks leaving the site is about 23 tons,[42] most of the truck traffic to/from the facility would travel north of Cargo Way, unless for local deliveries. Thus, the net-new vehicle trips to and from the project site would not create potentially hazardous conditions on streets farther from the project site.
- Implementation of the proposed project would not substantially change conditions for public transit in the area compared to existing conditions. There is no transit service on Amador Street or Cargo Way. The T Third Street light rail line operates within an exclusive right-of-way on Third Street, and the 15 Bayview Hunters Point Express bus route operates on Third Street, with no stops between Marin Street and Evans Avenue. The 19 Polk and 44 O'Shaughnessy bus routes operate on Evans Avenue, about 0.5 mile south of the project site. Thus, the net-new vehicle trips to and from the project site primarily via Amador Street, Cargo Way, and Third Street would not affect bus routes operating in the project vicinity.

For the reasons stated above, the proposed project would not create potentially hazardous conditions for people driving or public transit operations.

Walking and Bicycling. Amador Street provides vehicular access between the various industrial facilities within the Maritime Eco-Industrial Center. It is not intended for people walking; therefore, pedestrian and bicycle facilities such as sidewalks, crosswalks, and bicycle lanes are not provided on Amador Street. Few people walk or bicycle near the project site,[43] and this condition is not anticipated to change with the proposed project. The proposed project would not involve any changes to the street network that would

[41] *Truck payload capacity* refers to the maximum weight of cargo, passengers, and equipment a truck can safely carry in and on the vehicle itself.

[42] Personal communication between Michael Bishop, San Francisco Bay Area Marine Operations Manager for Martin Marietta, and José Farrán, Adavant Consulting, April 18, 2025.

[43] Counts of people walking and bicycling were conducted on April 29, 2025, at the intersection of Illinois Street/Cargo Way/Amador Street (about 0.45 mile west of the project site). During the weekday a.m. peak hour, there was one bicyclist and two people walking on Amador Street; during the p.m. peak hour, there was one bicyclist and one person walking on Amador Street.

create potentially hazardous conditions for, or interfere with, walking or bicycling to and from the project site and adjoining areas.

The southern portion of the project site (i.e., Parcel A – Addition 1 in draft EIR Figure 2-4, p. 2-9) is currently used by the public to access the Pier 94 wetlands area east of the project site. Upon implementation of the proposed project, the Port would relocate public access to the Pier 94 wetlands approximately 700 feet southeast of the project site (see draft EIR Figure 2-5, p. 2-10). Therefore, with implementation of the new public access to the southeast, the proposed project would not impede access to the Pier 94 wetlands area. Thus, the proposed project would not create potentially hazardous conditions or impede accessibility for people walking or bicycling.

Emergency Access. Current emergency vehicle access to the project site is via Amador Street. The proposed project would not introduce any design features or street network changes that would change emergency vehicle travel in the project vicinity compared to existing conditions. As described above, the proposed project would entail reconfiguration of the three existing driveways on Amador Street; however, this would not impede emergency vehicle travel to the site and surrounding area on Amador Street. Thus, the proposed project would not result in inadequate emergency access.

Based on the information above, the proposed project's operations would not create potentially hazardous conditions for people walking, bicycling, or driving or for public transit operations; interfere with accessibility for people walking or bicycling to and from the project site as well as adjoining areas; or result in inadequate emergency access. Therefore, impacts of the proposed project related to potentially hazardous conditions and accessibility would be less than significant, and no mitigation measures are required.

Impact TR-2: The proposed project would not substantially delay public transit. *(Less than Significant)*

There is no public transit service on Amador Street adjacent to the project site; the closest public transit service operates on Third Street (i.e., T Third light-rail line and the 15 Bayview Hunters Point Express bus route) and Evans Avenue (i.e., the 19 Polk and 44 O'Shaughnessy bus routes).

The peak hour for trucks entering and exiting the existing plant currently occurs between 9:15 and 10:15 a.m., which is after the typical morning peak commute period in San Francisco of 7 a.m. to 9 a.m. [44] As shown in Table 3, during the a.m. peak hour of truck activity at the facility, the facility would generate 18 net-new vehicle trips (eight inbound and 10 outbound) under project reasonable peak conditions and 21 net-new vehicle trips (10 inbound and 11 outbound) under project maximum conditions. During the p.m. peak hour, the facility would generate 41 net-new vehicle trips under project reasonable peak conditions and 44 new vehicle trips under project maximum conditions. The majority of the net-new vehicle trips would be to and from the adjacent ready-mix concrete facilities on Amador Street; very few vehicle trips would be on Third Street (15 Bayview Hunters Point Express route) or Evans Avenue (19 Polk and 44 O'Shaughnessy routes).

[44] Under existing conditions, the peak hour of facility operations occurs within the 8:30 a.m. to 10:30 a.m. morning period.

The SF transportation guidelines set forth a screening criterion for projects that would typically not result in significant public transit delay effects.[45] The projected net-new increase in the number of peak-hour vehicles under both project reasonable peak conditions (up to 41 net-new vehicles) and project maximum conditions (up to 44 net-new vehicles) would be substantially less than the screening criterion of 300 peak-hour project vehicle trips identified in the SF transportation guidelines that could result in transit delays and exceed the threshold of significance. Thus, the proposed project would not add a substantial number of new peak-hour vehicle trips to roadways with public transit service and would not delay public transit. Therefore, impacts of the proposed project related to public transit delay would be less than significant, and no mitigation measures are required.

Impact TR-3: The proposed project would not cause substantial additional vehicle miles traveled or substantially induce additional automobile travel. *(Less than Significant)*

The SF transportation guidelines set forth screening criteria for the types of projects that would typically not result in significant VMT impacts. The project site is in a transportation analysis zone (493)[46] where existing average daily VMT per capita for office-type uses (i.e., with worker trips) exceeds the planning department's screening criteria of 15 percent below the regional average threshold.[47] Therefore, the proposed project would not meet the locational screening criteria. In addition, the proposed project would have a FAR of less than 0.75 and would not meet the planning department's Senate Bill 743 checklist (SF transportation guidelines, Appendix L, Attachment A, Table 2) and California PRC section 21099 screening criteria for an employment center within a transit priority area. Thus, consistent with the SF transportation guidelines, an assessment was conducted to determine whether the proposed project would cause substantial additional VMT. This assessment includes a qualitative discussion on consistency of the proposed project with local and regional plans and whether the proposed project includes any features that would induce substantial additional VMT for employees or trucks transporting sand from the Pier 92 facility by changing travel characteristics, compared to existing conditions. The result of this additional assessment is described below.

- The transportation analysis zone in which the project is located includes warehouse, PDR, and maritime support uses within the Port's Piers 80–96 Maritime Eco-Industrial Center and within the Southern Waterfront subarea of the Port's Waterfront Plan. These types of uses involve vehicle-reliant activities such as construction equipment and material staging, concrete manufacturing and deliveries, and the import and export of fill/soils and deconstruction materials. These industrial and cargo operations have different travel characteristics, including origin/destination and time of day for travel, compared with more residential and commercial land uses in San Francisco and therefore have higher VMT per capita. Thus, the proposed project is a modification of an existing use located within an area identified by the City for these types of uses and is consistent with City plans.

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[45] San Francisco Planning Department, *Transportation Impact Analysis Guidelines*, http://default.sfplanning.org/publications_reports/TIA_Guidelines.pdf. Appendix I of the *Transportation Impact Analysis Guidelines* describes the transit delay screening criteria and threshold of significance.

[46] Planners use these zones as part of transportation planning models for transportation analyses and other planning purposes The zones vary in size from single blocks in the downtown core to multiple blocks in outer neighborhoods, with even larger zones in historically industrial areas such as within the Bayview. The project site is in transportation analysis zone 493, which is bounded by Islais Creek Channel, San Francisco Bay, and Cargo Way.

[47] The existing average daily VMT per capita for an office land use, which is applicable to the existing industrial uses on Pier 92, in transportation analysis zone 493 is 27.0. This VMT per capita is 4.9 percent above the regional average of 25.7 daily VMT per capita.

- The project site is also in the Metropolitan Transportation Commission's Plan Bay Area 2050 priority production areas,[48] which support key industrial clusters on industrial land. The city's priority production area is roughly bounded by Cesar Chavez Street to the north, Bayshore Baylands to the west, Industrial Street/Oakdale Avenue/Evans Avenue to the south, and San Francisco Bay to the east. This is the only priority production area designated within San Francisco. The Plan Bay Area 2050 EIR found that Plan Bay Area 2050 can achieve the California Air Resources Board target that calls for a 19 percent reduction in GHG emissions from cars and light trucks by 2035 compared with 2005 emission levels. Thus, the proposed project is consistent with Metropolitan Transportation Commission's Plan Bay Area 2050.
- The proposed project would modernize and reconstruct the existing sand processing facility but would not change the essential nature of the existing operations. With implementation of the proposed project, the volume of sand processed at the facility, as well as the associated number of trucks transporting sand to offsite locations, would continue to be market driven. The destinations would remain similar to those under existing conditions, including the two adjacent ready-mix concrete facilities along Amador Street and to project sites in San Francisco and San Mateo County. Thus, the proposed project would not induce substantial additional VMT associated with trucks transporting sand from the Pier 92 facility.
- With implementation of the proposed project, the number of employees at the project site would increase from five employees under existing conditions to six employees under project reasonable peak conditions and nine under project maximum conditions. All employees drive to the project site. Implementation of the proposed project would not change employee ways of travel or the distances that employees travel; therefore, the proposed project would not induce substantial additional VMT associated with employee travel.

For the above reasons, the proposed project would not cause substantial additional VMT.

Induced Automobile Travel. With respect to induced automobile travel, the proposed project would not include new features that would alter the transportation network. The project would slightly reconfigure, pave,[49] and gate two driveways on Amador Street (i.e., one inbound driveway and one outbound) and would close an existing exit driveway (see draft EIR Figure 2-3, p. 2-7). The paving and modifications to driveways fit with the general types of projects that would not substantially induce automobile travel. Therefore, impacts of the proposed project related to VMT and induced automobile travel would be less than significant, and no mitigation measures are required.

Impact TR-4: The proposed project would not result in a loading deficit. *(Less than Significant)*

The existing facility currently accommodates deliveries of supplies by vehicle (e.g., Federal Express, UPS, U.S. Postal Service, vendor trucks) but not marine sand, which arrives by barge. Supplies are delivered within the site adjacent to the two office trailers that serve as administrative offices. Two or three vehicles could be accommodated within the delivery drop-off area at the same time, depending on vehicle size. With

[48] The Metropolitan Transportation Commission's priority production areas (PPAs) are locally identified places for growth in middle-wage jobs such as manufacturing, logistics, or other trades. An area must be zoned for industrial use or have a predominantly industrial use to be a PPA (Metropolitan Transportation Commission, *Priority Production Areas*, https://mtc.ca.gov/planning/land-use/priority-production-areas-ppas, accessed October 12, 2025).

[49] The project site is currently unpaved; the project would pave portions of the site where vehicles, including mobile equipment, travel.

implementation of the proposed project, deliveries by vehicle would continue to occur within the site adjacent to the office trailers, similar to existing conditions (see draft EIR Figure 2-3, p. 2-7). Similar to existing conditions, the proposed project would not include any designated onsite or on-street passenger loading spaces (i.e., white zones).

Delivery/Service Vehicle Loading. With implementation of the proposed project, the number of delivery and/or service vehicles traveling to the site on a daily basis is anticipated to remain similar to the number under existing conditions; however, it may increase minimally when the volume of marine sand processed increases (e.g., additional supplies required to maintain equipment). The proposed project would generate about five to 10 delivery and service vehicles a week, with about one to two vehicles per day. This corresponds to a demand for one loading space during the peak hour of loading activities (generally between 6:00 a.m. and 2:00 p.m.). Thus, the peak-hour delivery and service vehicle loading demand would be minimal and, similar to existing conditions, accommodated within the onsite delivery drop-off area.

Passenger Loading. Due to the location and hours of operation at the facility, all employees currently travel to work by private auto; it is not anticipated that a substantial number of trips from the limited increase in employees would shift to taxi or other rideshare ways of travel. Therefore, similar to existing conditions, passenger loading demand would be minimal and unlikely to occur during the p.m. peak travel period. With implementation of the proposed project, any passenger loading demand would be accommodated within the project site or within the travel lanes or shoulder adjacent to the project site on Amador Street. Stopping within the travel lanes would not substantially affect people walking, bicycling, or driving because there would be very few passenger loading events, which would also be of limited duration, and because there are very few people walking or bicycling adjacent to the project site. Thus, the proposed project would not result in a passenger loading deficit that could result in secondary impacts such as potentially hazardous conditions for people walking, bicycling, or driving or substantially delay public transit. Therefore, for the above reasons, impacts of the proposed project related to loading would be less than significant, and no mitigation measures are required.

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Impact TR-5: The proposed project would not result in a substantial vehicular parking deficit. *(Less than Significant)*

The SF transportation guidelines[50] include screening criteria for projects to determine if a proposed project would result in a substantial parking deficit that could result in secondary effects. Secondary effects of a parking deficit could create potentially hazardous conditions for people walking, bicycling, or driving; interfere with accessibility for people walking or bicycling; result in inadequate access for emergency vehicles; or substantially delay public transit. The project site is in a transportation analysis zone that does not meet the planning department's screening criteria and does not meet California PRC section 21099 screening criteria; therefore, an assessment was conducted to determine whether the proposed project would create a parking deficit that could result in secondary effects (i.e., deficit of 600 or more vehicle parking spaces).

The proposed project would generate an employee vehicle parking demand of six spaces on a typical day and up to nine spaces on days when additional personnel are required to assist in the processing of arriving

[50] San Francisco Planning Department, *Transportation Impact Analysis Guidelines*, http://default.sfplanning.org/publications_reports/TIA_Guidelines.pdf. Appendix O of the *Transportation Impact Analysis Guidelines* describes the parking screening criteria checklist.

and departing trucks (e.g., when the number of daily trucks accessing the project site approaches 300 trucks). In addition to the employee parking demand, there would be an occasional visitor demand. However, the 10 onsite vehicle parking spaces would accommodate the employee and visitor demand. Thus, the proposed project would not result in a parking deficit and would not result in secondary effects that could create potentially hazardous conditions for people walking, bicycling, or driving; interfere with accessibility for people walking or bicycling; result in inadequate access for emergency vehicles; or substantially delay public transit. Therefore, impacts of the proposed project related to parking would be less than significant, and no mitigation measures are required.

Impact C-TR-1. The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact on transportation and circulation. ***(Less than Significant)***

Cumulative development projects within a 1,000-meter radius of the project site are identified in draft EIR p. 3-8 and mapped in Figure 3-1, Cumulative Projects within a 1,000-Meter Radius of the Project Site, p. 3-12. These projects would not generate substantial additional travel demand or result in permanent changes to the transportation network in the project vicinity.

The Islais Creek Bridge and the Amador Street projects are bridge rehabilitation and sewer and roadway upgrade projects that would enhance transportation network conditions. They would not change the number of travel lanes or travel routes compared with existing conditions. The Pier 80 subsistence repairs, Pier 90 building and wharf demolition, and Pier 94/96 seismic repairs are also maintenance projects. When completed, they would not affect the transportation network. The Pier 94 grasslands meadow enhancements and Blue Greenway improvements are habitat restoration/waterfront open space system projects that would not generate substantial additional travel demand. The 50 Quint Street project would add an electric vehicle repair and maintenance facility to an existing private surface parking facility; it is not in the immediate vicinity of the project site.

Changes to the permitting for the CEMEX facility, located about 820 feet (250 meters) west of the project site, would allow for import of aggregate by barge (in addition to by truck), and would allow for an increase in the amount of sand imported to the site by barge, but would not change the downstream throughput limits for either sand or aggregate. Similar to the demand for sand processed at the Pier 92 facility, demand for concrete produced at the CEMEX facility, is market driven. Changes to the permitting for the CEMEX facility would not increase the number of trucks delivering concrete to construction sites in CEMEX's service area or substantially change the number of vehicles transporting aggregate and/or sand on area roadways on a daily or peak-hour basis. Any increases in sand deliveries by barge to the CEMEX facility (i.e., permitted up to an additional 175,572 tons per year) would be associated with a similar corresponding decrease in sand deliveries by truck from the Pier 92 facility. Similarly, initiating aggregate deliveries by barge directly to the CEMEX facility (i.e., permitted up to 153,803 tons per year) would likely decrease deliveries of aggregate by truck from other suppliers. Thus, depending on the amount of aggregate and/or sand imported by barge to the CEMEX facility, the number of trucks delivering sand or aggregate to the CEMEX facility on area roadways would either remain similar to or decrease from existing conditions. Overall, the CEMEX project would not substantially change the number of CEMEX concrete trucks on the broader roadway network.

Potentially Hazardous Conditions and Accessibility. The cumulative transportation, infrastructure, and open space projects, as well as the CEMEX concrete facility project, would conform to the requirements of the Better Street Plan, Transit First Policy, and Vision Zero, along with Port and other city requirements, as

applicable. Similar to the proposed project, none of the cumulative projects would alter the existing street grid, reconfigure intersections, or introduce physical features that would cause potentially hazardous conditions for people walking, bicycling, or driving or for transit operations; impede access for people walking or bicycling; or interfere with emergency access compared to existing conditions. Therefore, the proposed project would not combine with other cumulative projects to result in significant cumulative impacts related to potentially hazardous conditions and accessibility (less-than-significant impact).

Transit Delay. There are no public transit routes operating along Amador Street. There are no cumulative projects that would substantially affect transit service or facilities near the project site; therefore, transit operations in the project vicinity would remain similar to existing conditions. In addition, none of the cumulative projects include transportation features that would delay transit (e.g., travel lane reductions on streets with transit routes). Thus, given the limited number of vehicles generated by the cumulative projects, and that the number of net-new peak-hour vehicle trips with the maximum truck throughput of 300 daily trucks under the Air District permit (i.e., up to 44 net-new peak-hour trips) would meet the screening criterion identified in the SF transportation guidelines, the proposed project would not combine with cumulative projects to cause substantial transit delay. Therefore, the proposed project would not combine with other cumulative projects to result in significant cumulative public transit impacts (less-than-significant impact).

VMT. VMT is, by its nature, a cumulative impact. Because most cumulative projects are transportation, infrastructure, and open space projects that would not generate new vehicle trips, they would not generate substantial additional VMT or substantially induce automobile travel. Similar to the project site, most cumulative projects are in the Plan Bay Area 2050 priority production areas that support key industrial clusters on industrial land that is already well served by the region's roadway network. Under 2050 cumulative conditions, average daily VMT per capita for the transportation analysis zone in which the project site is located would continue to exceed the planning department's screening criteria of 15 percent below the regional average, although average daily VMT per capita would decrease compared to existing conditions.[51] For the same reasons described in Impact TR-3, the proposed project would not cause substantial additional VMT or substantially induce automobile travel. Therefore, the proposed project would not combine with other cumulative projects to result in significant cumulative VMT impacts (less-than-significant impact).

Loading and Parking. Most cumulative projects would not generate new freight or passenger loading trips or vehicle parking demand during project operations. Any passenger and freight loading activities and vehicle parking demand associated with the cumulative projects would be contained within the cumulative project sites (e.g., 50 Quint Street project) or localized in the vicinity of the cumulative projects and would not combine with the proposed project to result in a substantial loading or parking deficit (less-than-significant impact).

For the above reasons, the proposed project would not combine with cumulative projects to result in significant cumulative transportation and circulation impacts. As such, cumulative transportation and circulation impacts would be less than significant. No mitigation measures are necessary.

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[51] The 2050 cumulative conditions average daily VMT per capita for an office land use, which is applicable to the existing industrial uses on Pier 92, in transportation analysis zone 493 is 21.9. This VMT per capita is 8 percent below the regional average of 23.8 average daily VMT per capita.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
7. NOISE. Would the project result in:					
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan area or, where such a plan has not been adopted, in an area within two miles of a public airport or public use airport, would the project expose people residing or working in the area to excessive noise levels?	☐	☐	☐	☐	☒

The project site is not in the vicinity of a private airstrip or an airport land use plan area or within 2 miles of a public airport or public use airport. Therefore, Topic E.7.c is not applicable to the project and is not discussed further.

OVERVIEW OF NOISE AND SOUND

Noise and Vibration Definitions and Metrics

A brief description of the noise and vibration concepts and terminology used in this assessment is provided below.

- **Sound.** A vibratory disturbance transmitted by pressure waves through a medium such as air or water that is capable of being detected by a receiving mechanism, such as the human ear or a microphone.
- **Noise.** Sound that is loud, unpleasant, unexpected, or otherwise undesirable.
- **Decibel (dB).** A unitless measure of sound on a logarithmic scale that indicates the squared ratio of sound pressure amplitude to a reference sound pressure amplitude. The reference pressure is 20 micropascals.
- **Distance Attenuation.** Noise attenuation with distance is the reduction of sound intensity as distance increases from a noise source. For point-source attenuation, sound intensity decreases by 6 dB for each doubling of distance away from a noise source.
- **A-Weighted Decibel (dBA).** An overall frequency-weighted sound level in decibels that approximates the frequency response of the human ear. The dBA scale is the most widely used for environmental noise assessments.
- **Ambient.** The lowest sound level repeating itself during a specified period, usually a minimum of a 10-minute period. The minimum sound level is usually determined with the noise source at issue silent and at the same location where the noise level of the source at issue was measured. Under most

conditions, the level of noise exceeded 90 percent of the time (L_{90}) is a conservative representation of ambient conditions.

- **Maximum Sound Levels (L_{max}).** The maximum sound level measured during a given measurement period.
- **Equivalent Sound Level (L_{eq})**. The equivalent steady-state sound level that, in a stated period of time, would contain the same acoustical energy. The 1-hour A-weighted equivalent sound level (1-hour L_{eq} [dBA]) is the energy average of A-weighted sound levels occurring during a 1-hour period.
- **Day-Night Level (L_{dn}).** The energy average of the A-weighted sound levels occurring during a 24-hour period, with a 10 dB penalty added to sound levels between 10 p.m. and 7 a.m.
- **Peak Particle Velocity (PPV).** A measurement of ground vibration, defined as the maximum speed at which a particle in the ground is moving, expressed in inches per second (in/sec).

Noise Fundamentals

Noise is commonly defined as unwanted sound that annoys or disturbs people and potentially causes an adverse psychological or physiological effect on human health. Because noise is an environmental pollutant that can interfere with human activities, an evaluation of noise is necessary when considering the environmental impacts of a proposed action.

Sound is characterized by various parameters, including the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level is the most common descriptor used to characterize the loudness of an ambient (existing) sound level. Although the decibel scale, a logarithmic scale, is used to quantify sound intensity, it does not accurately describe how sound intensity is perceived by human hearing. The human ear is not equally sensitive to all frequencies in the entire spectrum; therefore, noise measurements are weighted more heavily toward frequencies to which humans are sensitive through a process referred to as A-weighting. The sound pressure level is measured in decibels (dB), with 0 dB corresponding roughly to the threshold of human hearing and 120 to 140 dB corresponding to the threshold of pain. Table 5 shows A-weighted sound levels for common noise sources.

Community noise environments are generally perceived to be quiet when the L_{dn} level is below 45 dBA, moderate in the 45 to 60 dBA range, and loud above 60 dBA. Very noisy urban residential areas are usually around 70 dBA $L_{dn.}$ Human sound perception, in general, is such that a change in sound level of 1 dB cannot typically be perceived by the human ear, a change in sound level of 3 dB is just noticeable, a change of 5 dB is clearly noticeable, and a change of 10 dB is perceived as doubling or halving the sound level. A doubling of actual sound energy is required to result in a 3 dB (i.e., barely noticeable) increase in noise; in practice, this means that the volume of traffic on a roadway, for example, would typically need to double to result in a noticeable increase in noise.

Table 5. Typical A-Weighted Sound Levels

Common Outdoor Activities	Sound Level (dBA)	Common Indoor Activities
	110	Rock band
Jet flyover at 1,000 feet		
	100	
Gas lawnmower at 3 feet		
	90	
Diesel truck at 50 mph at 50 feet		Food blender at 3 feet
	80	Garbage disposal at 3 feet
Noisy urban area, daytime		
Gas lawnmower at 100 feet	70	Vacuum cleaner at 3 feet
Commercial area		Normal speech at 3 feet
Heavy traffic at 300 feet	60	
		Large business office
Quiet urban area, daytime	50	Dishwasher in next room
Quiet urban area, nighttime	40	Theater, large conference room (background)
Quiet suburban area, nighttime		
	30	Library
Quiet rural area, nighttime		Bedroom at night, concert hall (background)
Rustling of leaves	20	
		Broadcast/recording studio
	10	
Lowest threshold of human hearing	0	Lowest threshold of human hearing

Source: California Department of Transportation, Division of Environmental Analysis, *Technical Noise Supplement to the Traffic Noise Analysis Protocol*, September 2013.

Notes: dBA = A-weighted decibel

Noise-Sensitive Receptors

Noise-sensitive receptors generally include hospitals, skilled nursing/convalescent care facilities, schools, day cares, churches, libraries, and residences. The nearest residences are approximately 3,000 feet southwest of the project site on Bowman Court. The Center for Youth Wellness at 3450 Third Street is approximately 3,000 feet west of the project site.

Vibration

Vibration is an oscillatory motion through a solid medium. Typically, groundborne vibrations generated by manmade activities attenuate rapidly with distance from the source of the vibration. The effects of vibration on structures are typically measured by peak particle velocity (PPV) in inches per second (in/sec). For modern reinforced structures, the vibration damage threshold is a PPV of 0.5 to 2.0 in/sec. Except for long-term occupational exposure, vibration levels rarely affect human health. Instead, most people consider vibration to be an annoyance that can affect concentration or disturb sleep. People may tolerate infrequent, short-duration vibration levels, but human annoyance to vibration becomes more pronounced if the vibration is continuous or occurs frequently. High levels of vibration can damage fragile buildings or interfere with sensitive equipment.

Typical sources of groundborne vibration in San Francisco are large-scale construction projects that involve pile driving, vibratory construction equipment, or underground tunneling. Vibration is also caused by transit vehicles in the subway system and on the surface, including Muni light rail vehicles, historic streetcars, and Bay Area Rapid Transit (BART) trains. In general, such vibration is only an issue when there are sensitive receptors located nearby.

Rubber-tire vehicles such as Muni buses, trucks, and automobiles rarely create substantial vibration because rubber tires and suspension systems are highly effective at dampening vibration from motor vehicles. Generally, vehicles produce perceptible vibration only if there are substantial discontinuities in the road surface.

Vibration-Sensitive Receptors

Receptors that are sensitive to vibration generally include structures (especially older masonry structures), older utilities, people (especially residents during nighttime hours, the elderly, and the sick), and equipment (e.g., magnetic resonance imaging equipment and high-resolution lithographic, optical, and electron microscopes).[52] The nearest vibration-sensitive uses are residences on Bowman Court, approximately 3,000 feet southwest of the project site.

REGULATORY SETTING

San Francisco Noise Ordinance

Construction (Sections 2907 and 2908)

Article 29 of the San Francisco Police Code regulates noise and prohibits excessive or unnecessary noise. In particular, sections 2907 and 2908 of the code address construction equipment and construction work at night, respectively. Section 2907(a) prohibits any powered construction equipment from exceeding 80 dBA when measured at a distance of 100 feet. Impact tools, such as jackhammers and pavement breakers, are exempt from this requirement, but section 2907(b) requires that all such equipment be used with manufacturer-approved acoustic shields. Section 2908 addresses construction work at night. This prohibits construction between 8 p.m. and 7 a.m. if the resulting noise level would exceed the ambient noise level by

[52] Federal Transit Administration, *Transit Noise and Vibration Impact Assessment,* FTA Report No. 0123, 2018, https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf, accessed January 30, 2024.

5 dB or more. This restriction can be waived or modified only by a special permit issued by the director of public works.

The decision to approve a permit would consider the potential for disturbance at nearby receptors. Disturbance from nighttime noise is more likely to occur in a neighborhood where there are existing residential receptors because of the potential for sleep disturbance. An approved nighttime construction permit would include conditions regarding the types of equipment to be used as well as the allowed durations for nighttime use to minimize disturbances in the community. Contractors of development projects would be required to comply with these permit conditions.

Noise Limits (Section 2909)

Section 2909 of the noise ordinance regulates noise from mechanical equipment and other similar sources. The noise ordinance (section 2909[a] and [b]) limits noise from sources such as machines/devices or music/entertainment venues, or any combination of same, located on residential or commercial/industrial property to 5 or 8 dBA, respectively, above the local "ambient" noise level at any point outside the property line of a residential or commercial/industrial property. The noise ordinance also limits noise from sources located on public property to 10 dBA above the local ambient noise level at a distance of 25 feet or more, unless the source (e.g., machine/device) is being operated to serve or maintain the property.

Section 2909(d) of the noise ordinance limits noise, as measured from inside any sleeping or living room in any dwelling unit on residential property, from a "fixed source" to 45 dBA between the hours of 10 p.m. and 7 a.m. or 55 dBA between the hours of 7 a.m. and 10 p.m. with windows open, except where building ventilation is achieved through mechanical systems that allow windows to remain closed.

ENVIRONMENTAL SETTING

Sources of ambient noise in the area of the proposed project are characteristic of an urban waterfront environment, including vehicles, aircraft, cargo vessels, freight and commuter trains, industrial operations, and mechanical equipment. For the Waterfront Plan EIR,[53] ambient noise level data were collected in January 2021 at Cargo Way and Third Street, which is near Pier 92. The measured ambient level at this location was 75 dBA L_{dn}, with an average daytime level of 70 dBA 1-hour L_{eq} and an average nighttime level of 68 dBA 1-hour L_{eq}.

The nearest residences are approximately 3,000 feet southwest of the project site on Bowman Court. The Center for Youth Wellness at 3450 Third Street is approximately 3,000 feet west of the project site.

IMPACTS AND MITIGATION MEASURES

Impact NO-1: The proposed project would not generate a substantial temporary or permanent increase in ambient noise levels in the vicinity of the proposed project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies. *(Less than Significant)*

Construction Noise

Construction of the redeveloped site would occur for approximately 7 months; no night construction work would occur. Construction would entail disassembly of old equipment, site grading, paving, installation of

[53] City of San Francisco, Waterfront Plan EIR, Case No. 2019-023037ENV.

new equipment, and construction of a warehouse structure. Paving the site, involving a paver and a roller, would be the loudest phase of construction; the paver and roller may be used simultaneously.

The assessment of noise levels from heavy construction equipment was based on equipment data provided in Federal Transit Administration (FTA) guidance (FTA 2018). In accordance with the description of construction work provided by the project sponsor, project construction equipment is listed in Table 6, along with reference noise levels for each equipment type.

Table 6. Reference Noise Levels for Heavy Equipment Types

Equipment	Reference Noise Level at 50 Feet (dBA, Lmax)	Reference Noise Level at 100 Feet (dBA, Lmax)
Crane	83	77
Loader	80	74
Paver	85	79
Truck	84	78
Bobcat	80	74
Compactor	82	76
Roller	85	79
Grader	85	79
Forklift	80	74
Man lift	73	67

Sources: Federal Transit Administration 2018; Federal Highway Administration 2006.

dBA = A-weighted decibel; L_{max} = maximum sound level

Typical sound levels from heavy construction equipment are in the range of 73 to 85 dBA L_{eq} at a reference distance of 50 feet. Section 2907 of the City's noise ordinance prohibits operation of any powered construction equipment (non-impact), regardless of age or date of acquisition if such operation emits noise at a level in excess of 80 dBA when measured at a distance of 100 feet from such equipment. Impact tools that exceed the limit are required to be fitted with mufflers, acoustical shields, or enclosures. As shown in Table 6, construction equipment used would operate within the constraints of the noise ordinance standards.

The daytime construction noise analysis also quantitatively evaluates combined noise from the two loudest pieces of equipment at sensitive receptor locations to determine if construction noise would exceed 90 dBA or would be 10 dBA above the ambient daytime noise level at a noise-sensitive receptor, or 100 dBA at commercial and industrial receptors. If so, the evaluation then qualitatively considers the frequency, duration, and intensity of noise levels in determining whether the project would result in a significant noise impact. Nighttime noise impacts are also assessed, based on the potential to result in sleep disturbance at nearby residential and hotel uses (increase interior noise levels above 45 dBA), as established by the noise ordinance. However, as described above, there would be no nighttime construction work required for construction of the proposed project.

The construction noise level at a given receiver location would depend on the type of construction activity as well as the distance and shielding between the activity and noise-sensitive receivers. To characterize the source level of the worst-case noise condition during each phase of project construction, the two loudest pieces of equipment were assumed to be operating simultaneously at a perimeter location. As shown in Table 6, each of these types of equipment would produce a reference noise level of 85 dBA at 50 feet and would combine to produce an overall noise level of 88 dBA L_{eq} at 50 feet. At the nearest residence on Bowman Court and The Center for Youth Wellness, each about 3,000 feet away, noise levels from heavy equipment would be approximately 52 dBA L_{eq} based on point-source attenuation from the source, which would be well below ambient levels. Because the nearest noise-sensitive land uses are far from Pier 92, there would be no noticeable increase in ambient noise levels at noise-sensitive uses during construction. Therefore, this impact is less than significant. No mitigation is required.

Operational Noise

Existing operations of the project that result in operational noise include the use of barges, conveyors, a front-end loader, and trucks to process and/or transport sand. These types of mobile and stationary noise sources are currently operating on the site as part of the existing sand processing facility at Pier 92. Given that sand processing is an existing source of noise at the site, operating conditions with the project would be similar to conditions without the project because the site would be redeveloped for the same use but with more modern equipment. As such, future conditions and equipment use with redevelopment of the site would be similar to existing conditions, except that throughput production would increase from approximately 349,000 tons per year to a maximum of 800,000 tons per year. The throughput generally indicates an increase in the volume of barging and trucking activity at the sand processing facility. As a result, barge unloading and truck loading would occur more frequently, but noise levels from unloading and loading events would be similar to existing conditions.

Sand processing operations depend on the timing of barge deliveries and truck loading, which could occur any time of day or night. As a conservative assumption, sand processing operations could occur 24 hours a day, but this would not occur routinely. Simultaneous operation of a loader and a truck produces a reference noise level of 85 dBA 1-hour L_{eq} at 50 feet. This represents a worst-case operating condition with equipment operating at full power under both existing conditions and future conditions with operation of the redeveloped site. This worst-case condition occurs intermittently under existing conditions, but would be expected to occur with greater frequency with the increase in throughput post-redevelopment. However, because the noise level from operations would be similar to existing conditions under the redevelopment, the increase in throughput would not result in a noticeable increase in noise at the nearest receptor. At the nearest residence on Bowman Court and The Center for Youth Wellness, each about 3,000 feet away, worst-case noise levels from heavy equipment during site operation would be about 49 dBA 1-hour L_{eq} based on point-source attenuation from the source, which would be well below ambient levels. Barge unloading and truck loading would occur more frequently due to the increase in throughput at the site, but noise levels from unloading and loading events would be similar to existing conditions. Because the project would not introduce any new stationary noise sources and the nearest noise-sensitive receptor would be about 3,000 feet away, this impact would be less than significant.

Traffic Noise

As discussed above, traffic on a roadway would need to double to produce a noticeable increase in noise (i.e., a 3 dB increase in noise). As shown in Table 4 in the Transportation section, under both the reasonable

peak and maximum conditions, the largest increase in traffic volumes would occur on Amador Street east of Illinois Street, particularly during the p.m. peak hour. Along this corridor, p.m. peak hour vehicle trips would increase from 100 to 112 trips under the reasonable peak condition and from 100 to 119 trips under the maximum condition. These increases would not result in a doubling of traffic, nor as Table 4 shows, would traffic volumes double on any other roadways local to Pier 92 as a result of the project. As such, even under worst-case conditions, the increased vehicle trips associated with the project would not result in a noticeable change in traffic noise compared to existing conditions. For these reasons, noise from project operation would be less than significant. No mitigation is required.

Impact NO-2: The proposed project would not generate excessive groundborne vibration or groundborne noise levels. ***(No Impact)***

Construction Vibration

The use of construction equipment could intermittently result in perceptible levels of groundborne vibration in the immediate vicinity of the project site during construction. A vibratory roller (source vibration level with a PPV of 0.210 in/sec at 25 feet, as shown in Table 7) would produce the highest vibration levels during project construction. Groundborne vibration during project construction was analyzed using the methodology from the FTA manual. Vibration source levels (expressed in terms of PPV in/sec at a reference distance of 25 feet from the source) for the typical construction equipment proposed for the project are shown in Table 7. According to project-specific information provided by the applicant, construction of the project would not require impact equipment such as pile drivers, which would be the most vibration-intensive construction equipment. Therefore, for this project, a vibratory roller (source vibration level with a PPV of 0.210 in/sec at 25 feet) is expected to produce the highest vibration level.

There are no permanent structures present on the project site or in the immediate vicinity; thus, project construction would not have the potential to result in building damage and would not exceed the Caltrans recommend standard of 0.25 inches per second PPV for older structures.[54] There would be no nighttime construction, and vibration from construction would not be perceptible at the nearest residential uses and would not result in any potential sleep disturbance. Therefore, there would be no impact. Mitigation measures would not be necessary.

Table 7. Reference Vibration Levels of Construction Equipment

Equipment	PPV at 25 Feet	PPV at 50 Feet	PPV at 75 Feet	PPV at 100 Feet
Vibratory roller	0.210	0.074	0.040	0.026
Large bulldozer	0.089	0.032	0.017	0.011
Loaded trucks	0.076	0.027	0.015	0.010
Jackhammer	0.035	0.012	0.007	0.004
Small bulldozer	0.003	0.001	0.001	< 0.001

Source: Federal Transit Administration 2018.

PPV = peak particle velocity

[54] California Department of Transportation, *Transportation and Construction Vibration Guidance Manual*, April 2020.

Operational Vibration

Operation of the project would consist of the use of delivery trucks to transport sand from the processing facility. Rubber-tired vehicles are not a significant source of vibration; vibration from such sources would not be perceptible at the nearest receptors, and this impact is less than significant. Mitigation measures would not be necessary.

Impact C-NO-1. The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact on noise. ***(Less than Significant)***

Construction and operation of the proposed project could occur concurrently with construction and operation associated with cumulative projects. Cumulative noise from simultaneous construction activities in proximity to one another could result in higher noise levels than would otherwise occur with one project under construction. Restoration and repair associated with cumulative projects in the vicinity of the site would require the use of trucks, loaders, and heavy equipment for demolition. Although these activities could result in an incremental increase in ambient noise, they are unlikely to be noticeable due to the existing ambient noise levels in the area, as described in Table 7. In general, cumulative projects would not overlap with Pier 92 construction; however, seismic improvements at Pier 94/96 could occur simultaneously or overlap with Pier 92 construction. The seismic improvement project would also be 3,200 feet from the nearest residence. Similarly, truck volumes associated with cumulative projects would not result in a noticeable increase in ambient noise levels. There are no other operational aspects from these projects that would result in a cumulative increase in noise.

Vibration from construction of cumulative projects could occur at the same time as construction or operation of the proposed project. However, because of the highly localized nature of vibration from heavy equipment, construction vibration from projects located near one another would generally not combine to further increase vibration levels. Thus, vibration resulting from construction of the proposed project would not combine with vibration from cumulative projects. Therefore, this impact would be less than significant. Mitigation measures would not be necessary.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
8. AIR QUALITY. Would the project:					
a) Conflict with or obstruct implementation of the applicable air quality plan?	☒	☐	☐	☐	☐
b) Result in a cumulatively considerable net increase in any criteria pollutant for which the project region is non-attainment under an applicable federal, state, or regional ambient air quality standard?	☒	☐	☐	☐	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☒	☐	☐	☐	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☒	☐	☐	☐	☐

Implementation of the project could have the potential to result in significant impacts related to air quality; therefore, this topic is further analyzed in draft EIR Section 3.C, Air Quality.

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Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
9. GREENHOUSE GAS EMISSIONS. Would the project:					
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☒	☐	☐
b) Conflict with any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact C-GG-1: The proposed project would not generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment. *(Less than Significant)*

The proposed project would maintain the same type of use at the site as under existing conditions but would increase the intensity by expanding annual sand processing throughput. Thus, the proposed project would contribute to the cumulative effects of climate change by directly and indirectly emitting greenhouse gases (GHGs) during construction and operation. At the existing site, the direct effects include GHG emissions from truck and employee trips and the use of off-road equipment and marine barges. Thus, direct operational effects from the proposed project would include the GHG emissions from additional truck and employee

trips and increased off-road equipment use (e.g., loaders) resulting from expanded sand processing capacity. The proposed project would also increase the use of marine barge trips such that there would be 2.3 times more barge trips than under the existing conditions. Marine barges are sources of emissions that are regulated by the California Air Resources Board. Specifically, barges are subject to the commercial harbor craft regulation,[55] which ensures that barges used to transport material to the site will continue to emit GHGs to a degree consistent with the goals of the California Air Resources Board. The current indirect effects of the site include GHG emissions resulting from electricity production, including generation of the electricity required to pump, treat, and convey water; other GHG emissions include those associated with waste removal, waste disposal, and landfill operations. Additional indirect GHG emissions would be the result of the increased use of water to process additional sand. Similarly, the existing facility has five employees who use water at the site and generate wastewater and solid waste. The proposed project would add one employee under project reasonable peak conditions. Consequently, there would be a nominal increase in GHG emissions with the addition of one permanent employee. The occasions when up to three additional employees would be necessary under project maximum peak conditions would be temporary and extremely rare; thus, GHG emissions would increase very slightly.

The proposed project would be subject to regulations adopted to reduce GHG emissions, as identified in the City's GHG Reduction Strategy and demonstrated in the GHG checklist completed for the proposed project.[56] The proposed project is not a typical land development, such as a residential or mixed-used development; therefore, many of the regulations designed for typical developments are not applicable to the proposed project. For regulations that are applicable, the project's design and implementation would be required to be in compliance with those regulations. For example, the project sponsor would provide a transit subsidy to employees that would be at least equal in value to the cost of a San Francisco Municipal Railway (Muni) or Bay Area Rapid Transit (BART) monthly pass, consistent with the City's Commuter Benefits Ordinance, which reduces GHG emissions from single-occupancy vehicles by promoting the use of alternative transportation modes with zero or lower GHG emissions on a per capita basis.

The proposed project, namely, the proposed sand storage warehouse and new equipment, would be all-electric types, consistent with the City's building code. In addition, the proposed project would be required to comply with the energy efficiency requirements of the 2022 Port of San Francisco Green Building Standards Code and the City's Stormwater Management Ordinance, which would promote energy and water efficiency, thereby reducing the proposed project's energy-related GHG emissions. Another aspect of the proposed project that will increase energy efficiency is the fact that older, less efficient stationary equipment would be replaced with newer, more efficient stationary equipment.

The proposed project's waste-related emissions, which would increase temporarily during construction and on an ongoing basis during operations resulting from the addition of one employee, would be reduced through compliance with the City's Mandatory Recycling and Composting Ordinance, Construction and Demolition Debris Recovery Ordinance, and the construction and demolition debris recovery provisions of the Port of San Francisco Building Code (Chapter 13B) and Green Building Code (5.103.1.3.1). These regulations reduce the amount of material sent to landfills, which minimizes the methane emissions from waste decay at landfills. These regulations also promote reusing materials, which offsets the energy required

[55] California Air Resources Board, *Final Regulation Order Commercial Harbor Craft Regulation*, n.d., https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2021/chc2021/chcfro.pdf.

[56] San Francisco Planning Department, *Greenhouse Gas Analysis: Compliance Checklist for PIER 92 Modernization and Plant Replacement Project,* September 4, 2025.

to produce new materials. The proposed project would not remove any trees and thus would not result in a loss of carbon sequestration.

The project sponsor would be required to comply with applicable regulations, which have reduced San Francisco's GHG emissions to 48 percent below 1990 levels,[57] far exceeding statewide and regional GHG reduction targets. The proposed project would be subject to regulations adopted to reduce GHG emissions and consistent with San Francisco's GHG Reduction Strategy. Therefore, it would not generate significant GHG emissions. The impact would be less than significant. Mitigation measures would not be necessary.

Impact C-GG-2: The proposed project would not conflict with any policy, plan, or regulation adopted for the purpose of reducing GHG emissions. ***(Less than Significant)***

As noted under Impact C-GG-1, emissions from the proposed project would be minimized through compliance with applicable regulations as documented in the GHG checklist. For each source of emissions under the proposed project (e.g., building energy, transportation, waste, water use), compliance with the applicable regulations would ensure that effects would be minimized.

The City's Climate Action Plan (CAP) has been effective at helping the City meet its GHG reduction targets. San Francisco's GHG emissions have decreased measurably compared with 1990 levels, demonstrating that San Francisco has met or exceeded Executive Order S-3-05, the California Global Warming Solutions Act, and the Bay Area 2017 Clean Air Plan GHG emission reduction goals for 2020. Further, the City has exceeded its goal to reduce GHG emissions to 25 percent below 1990 levels by 2017; emissions were reduced by 36 percent. As of 2022, San Francisco has reduced its GHG emissions to 48 percent below 1990 levels, despite a population increase of 12 percent.[58] In addition, the City's local GHG emission reduction targets meet or exceed the long-term GHG emission reduction goals of Executive Order S-3-05, Executive Order B-30-15, the California Global Warming Solutions Act of 2016, the Bay Area 2017 Clean Air Plan, and the State of California's (State's) long-term goal of carbon neutrality. Therefore, because the proposed project would be consistent with the City's GHG emission reduction strategy, it would meet or exceed the GHG emission reduction goals of Executive Order S-3-05, Executive Order B-30-15, the California Global Warming Solutions Act of 2016, and the Bay Area 2017 Clean Air Plan and be on track to meet the carbon neutrality goal. Because the proposed project would not conflict with GHG emission reduction goals, it would result in a less-than-significant impact with respect to conflicts with a plan, policy, or regulation adopted for the purpose of reducing GHG emissions. Mitigation measures would not be necessary.

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[57] San Francisco Environment Department, *San Francisco Climate Action Plan 2025 Update – Draft Proposed Goals, Strategies, and Actions,* April 15, 2025, https://www.sfenvironment.org/CAP-2025.

[58] San Francisco Department of the Environment, *San Francisco's Carbon Footprint,* n.d., https://sfenvironment.org/carbonfootprint, accessed September 5, 2025.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
10. WIND. Would the project:					
a) Create wind hazards in publicly accessible areas of substantial pedestrian use?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact WI-1: The proposed project would not create wind hazards in publicly accessible areas of substantial pedestrian use. *(Less than Significant)*

In general, new buildings that are less than approximately 85 feet tall are unlikely to result in substantial adverse effects associated with ground-level winds that would make pedestrians uncomfortable or cause hazardous wind conditions. Such winds may occur under existing conditions, but shorter buildings typically do not cause substantial changes in ground-level winds. Currently, there are nearby industrial structures as tall as 85 feet. Although the publicly accessible Pier 94 wetlands are adjacent to the project site, there are no nearby San Francisco Recreation and Parks facilities or public trails. The project would install a 63-foot-tall (at peak only) warehouse structure to cover product stockpiles. Because buildings less than 85 feet tall typically do not result in substantial increases in ground-level winds, it is anticipated that the proposed project would have a minimal, if any, effect on wind speeds in the area. Although there is publicly accessible open space in the vicinity, the proposed project would not substantially alter the wind patterns on this space due to the relatively low height and small footprint of the proposed structures. For these reasons, the project would have a less-than-significant impact on wind in public areas surrounding the project site. Mitigation measures would not be necessary.

Impact C-WI-1: The proposed project, combined with cumulative projects, would not result in significant cumulative impacts related to wind. *(Less than Significant)*

The geographic context for the analysis of potential cumulative impacts related to wind consists of the development and infrastructure projects within 0.25 mile of the project site, as listed in draft EIR Section 3, Environmental Setting, Impacts, and Mitigation Measures, p. 3-8, and draft EIR Figure 3-1, p. 3-12. The cumulative projects do not include buildings that would be more than 85 feet tall. Moreover, because of the nature of these projects and their distance from the project site, cumulative projects would not combine with the proposed project to redirect winds or cause increases in wind speeds at ground level. Therefore, the cumulative wind impact would be less than significant. Mitigation measures would not be necessary.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
11. SHADOW. Would the project:					
a) Create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact SH-1: The proposed project would not create new shadow that substantially and adversely affects the use and enjoyment of publicly accessible open spaces. *(Less than Significant)*

Although the publicly accessible Pier 94 wetlands are adjacent to the project site, there are no nearby San Francisco Recreation and Parks facilities or public trails. The closest publicly accessible park or open space is the San Francisco Bay Trail, which is approximately 0.5 mile west and southwest of the project site (along Cargo Way). The project would install a 63-foot-tall (at peak only) warehouse structure to cover product stockpiles. This is approximately 23 feet taller than the existing tallest equipment currently on the site (at 40 feet above grade). The project's shadow fan for this new structure shows no new shadow on property under the jurisdiction of San Francisco Recreation and Parks, but it would cast shadow on the adjacent Pier 94 wetland, though not extending into San Francisco Bay.[59] Although there would be temporary shadow on the nearby open space, this shadow would be limited to afternoon and sunset hours. It would not be extensive, and the use and enjoyment of the park or open space would not be adversely affected. Therefore, the project's shadow-related impact would be less than significant. Mitigation measures would not be necessary.

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Impact C-SH-1: The proposed project, combined with cumulative projects, would not result in significant cumulative impacts related to shadow. *(No Impact)*

The geographic context for the analysis of potential cumulative impacts related to shadow consists of development and infrastructure projects that could shade the same public open spaces, thereby increasing the amount or duration of shadow. For this project, the only open space to be shaded would be the Pier 94 wetlands. None of the cumulative projects near Pier 94 would erect any structures; there is no potential for a cumulative impact. Mitigation measures would not be necessary.

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[59] City and County of San Francisco, *Plan Check Letter: Pier 92 Sand Terminal Modernization Project, Shadow Fan of Proposed 63-foot-tall Tent Structure, Taking into Account Elevations*, mapped using Esri, Maxar, Earthstar Geographics, and the GIS User Community, August 21, 2025.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
12. RECREATION. Would the project:					
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated?	☐	☐	☒	☐	☐
b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	☐	☐	☐	☒	☐

IMPACTS AND MITIGATION MEASURES

Impact RE-1: The proposed project would not increase the use of existing neighborhood and regional parks or other recreational facilities. *(Less than Significant)*

The project site is an existing sand processing facility. It is near small parks, open spaces, and other recreational facilities. The Southern Waterfront subareas include the Blue Greenway, a 13-mile corridor along the southeast waterfront that incudes publicly accessible open spaces, habitat restoration areas, the San Francisco Bay Trail, and water recreation facilities. It begins at the foot of the Lefty O'Doul Third Street Bridge and continues south to India Basin. Waterfront open spaces and parks within 1 mile of the project site include the adjacent San Francisco Bay Area Water Trail, India Basin, with open spaces and parks (0.85 mile south); Islais Creek, with public access to the Islais Creek Promenade (0.50 mile northwest); Pier 94 wetlands (adjacent to the east); and Heron's Head Park (0.75 mile southeast). Additional waterfront open spaces and parks within the waterfront area but farther away from the project site include Bayfront Park, Mission Bay Park, Crane Cove Park, and the Pier 52 boat launch. China Basin Park, developed as part of the Mission Rock neighborhood project on Seawall Lot 337, is approximately 1 mile north of the project site. Pier 70 Waterfront Terrace and Slipway Park will be developed less than 1 mile north of the project site.[60]

The following public parks, open spaces, and recreation facilities are within 0.3 mile of the project site: [61]

- Islais Creek (300 feet west)
- Tulare Park (300 feet northwest)
- Pier 94 Wetlands (adjacent to the east)

The project does not propose residential units. A significant increase in the number of site visitors or employees who work at the site as a result of the project would not occur. It is anticipated that six employees would be required for operation of the project compared with five under current conditions. The occasions when up to three additional employees would be necessary under project maximum peak conditions would

[60] San Francisco Planning Department, *Final Environmental Impact Report: Waterfront Plan*, March 16, 2023, https://sfplanning.org/environmental-review-documents?title=waterfront+plan&field_environmental_review_categ_target_id=All&items_per_page=10, accessed August 5, 2025.

[61] San Francisco Planning Department, *SF Find: Property Information Map*, https://sfplanninggis.org/sffind/?tab=1&search=4502A002#searchbox, accessed August 5, 2025.

be temporary and extremely rare. Therefore, project implementation would not result in a permanent increase in demand for parks and recreational facilities in the vicinity.

On a citywide/regional basis, the demand for recreational facilities as a result of project visitors and employees would be minimal, considering the relatively small increase in the number of employees. In addition, given the availability of open space near the project site, as well as within the larger Waterfront Plan area, any small increase in project-generated recreational demand could be accommodated by existing recreational facilities. As such, anticipated use of recreational resources as a result of the project would not be expected to substantially increase or accelerate the physical deterioration or degradation of existing recreational resources and would not result in the need to provide new or expanded parks or recreational facilities.

For these reasons, implementation of the proposed project would not increase the use of existing recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated. Therefore, the proposed project's impact on recreational resources would be less than significant. Mitigation measures would not be necessary.

Impact RE-2: The proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. ***(No Impact)***

The proposed project would involve the expansion of the existing sand processing facility. It would not include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment. Therefore, the proposed project would have no impact related to the construction or expansion of recreational facilities. Mitigation measures would not be necessary.

Impact C-RE-1: The proposed project, combined with cumulative projects, would not result in significant cumulative impacts related to recreation. ***(Less than Significant)***

Cumulative development projects within a 1,000-meter radius of the project site are identified in draft EIR p. 3-8, and mapped in Figure 3-1, Cumulative Projects within a 1,000-Meter Radius of the Project Site, p. 3-12. The cumulative projects include the Pier 94 Grassland Meadow Enhancements, Blue Greenway Improvements, Amador Street Infrastructure Improvements, Pier 80 Subsidence Repairs, Pier 94/96 Seismic Improvements, CEMEX Construction Materials Pacific (Pier 92), Pier 90 Building and Wharf Demolition Project, Islais Creek Bridge Projects, and 50 Quint Street. Such infrastructure improvements and commercial development in the project vicinity may result in an intensification of land use. However, given the nature of the cumulative projects, an intensification of land use is not expected to result in a cumulative increase in demand for recreational facilities and other resources in the area or the city overall. As discussed under Impact RE-1, there are four parks, open spaces, or other recreational facilities within 0.3 mile of the project site. It is expected that existing and proposed recreational facilities would be able to accommodate the demand for recreational resources generated by the cumulative projects noted above, which consist of infrastructure improvements and commercial development. For these reasons, the proposed project, combined with cumulative projects, would not result in a significant cumulative impact on recreation. The impacts would be less than significant. Mitigation measures would not be necessary.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
13. UTILITIES AND SERVICE SYSTEMS. Would the project:					
a) Require or result in the relocation or construction of new or expanded water, wastewater treatment, storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	☒	☐	☐
b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry, and multiple dry years?	☐	☐	☒	☐	☐
c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☐	☒
d) Generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair attainment of solid waste reduction goals?	☐	☐	☒	☐	☐
e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	☒	☐

The project would not include use of septic tanks or alternative onsite wastewater disposal systems; therefore, criterion 13(c) is not applicable and is not discussed further in this section.

IMPACTS AND MITIGATION MEASURES

Impact UT-1: The proposed project would not require or result in the relocation or construction of new or expanded, water, wastewater treatment, or stormwater drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects. *(Less than Significant)*

The San Francisco Public Utilities Commission (SFPUC) provides and operates water supply and wastewater collection and treatment facilities for San Francisco. Pacific Gas and Electric Company (PG&E) provides electricity to the project site, and various private companies provide telecommunication facilities. Stormwater facilities onsite would comply with the 2013 National Pollutant Discharge Elimination System (NPDES) Phase II Municipal Separate Storm Sewer System (MS4) Permit, as described below in Section E.17, Hydrology and Water Quality.

The project site would continue to use portable restroom facilities under the proposed project. Implementation of the proposed project would increase wastewater flows from the project site due primarily to the increase in sand throughput and associated water used to wash the sand during processing. A truck-bed water spray system also would be installed that would contribute to wastewater discharge.

Approximately 10,000 square feet of the existing project site is impervious. Proposed site alterations, including asphalt for paving, concrete footers, drainage channels, and the warehouse, would result in approximately 96,000 square feet of impervious surface area. The proposed project would be required to comply with the San Francisco Stormwater Management Ordinance (Ordinance No. 83-10), adopted in 2010 and amended in 2016, and the 2016 Stormwater Management Requirements and Design Guidelines.

As described below in Section E.17, Hydrology and Water Quality, the current drainage system includes settling basins that are connected to an existing authorized discharge pond (EFF-001) by an underground pipe. The pond discharges into the Bay and would comply with NPDES waste discharge requirements (WDRs) for Discharges from Aggregate Mining, Marine Sand Washing, and Sand Offloading Facilities (General Permit No. CAG982001, Order No. R2-2020-0028). The general permit covers stormwater from aggregate mining, marine sand washing, and sand offloading facilities commingled with other wastewater from such facilities. The general permit requires preparation and implementation of a best management plan (BMP) that describes steps to ensure that discharges would not adversely affect receiving waters. Stormwater would be managed in accordance with the BMP plan, as required by the general permit.

The proposed project would install and operate a new sand processing system with new equipment, enhanced environmental controls, and other site upgrades. A modern stormwater management system would be installed and use drainage channels, valley gutters, and underground conveyances to direct flows to the discharge pond. In addition, operations and stormwater treatment onsite would comply with the 2013 NPDES Phase II MS4 Permit. Discharges covered under the MS4 permit do not include runoff from aggregate mining, marine sand washing, and sand offloading facilities. Compliance with these requirements would ensure that proposed improvements would not result in adverse environmental effects regarding stormwater drainage or wastewater treatment.

The proposed project would result in an increase in demand for electricity; however, this modest increase would not exceed the demand expected and provided for in the project area by PG&E.

As discussed in Impact UT-2, the proposed project would result in an increase in demand for water supply but would not itself result in the need for construction of new or expanded water treatment facilities or delivery infrastructure. Although the project site is within a designated recycled water use area, the project would not be subject to the requirements of the Recycled Water Ordinance and thus would not be required to install a recycled water system. [62]

For these reasons, the utility demand associated with the proposed project would not exceed the service capacity of the existing providers and would not require the construction of new facilities or expansion of existing facilities. No utility upgrades are anticipated for the project. Therefore, this impact would be less than significant. Mitigation measures would not be necessary.

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[62] San Francisco Public Utilities Commission, *Recycled Water Use*, https://www.sfpuc.gov/construction-contracts/new-developments/recycled-water-use, accessed September 26, 2025.

Impact UT-2: Sufficient water supplies are available to serve the proposed project and reasonably foreseeable future development during normal, dry, and multiple dry years unless the 2018 Bay-Delta Plan Amendment is implemented; in that event, the SFPUC may develop new or expanded water supply facilities to address shortfalls in single and multiple dry years but this would occur with or without the proposed project. Impacts related to new or expanded water supply facilities cannot be identified at this time or implemented in the near term; instead, the SFPUC would address supply shortfalls through increased rationing, which could result in significant cumulative effects, but the project would not make a considerable contribution to impacts from increased rationing. ***(Less than Significant)***

The San Francisco Public Utilities Commission (SFPUC) adopted the 2020 Urban Water Management Plan (UWMP) in June 2021, and more recently released the 2023 Interim Water Demand Projections in September 2023, which provides an update to the 2020 UWMP. [63,64] These documents provide current and projected water supplies that would be required to meet the demand for retail water customers through 2045 under normal, dry, and multiple dry years.

In December 2018, the State Water Resources Control Board adopted amendments to the Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary, which establishes water quality objectives to maintain the health of rivers and the Bay-Delta ecosystem (the Bay-Delta Plan Amendment). Implementation of the Bay-Delta Plan Amendment would result in a substantial reduction in the SFPUC's water supplies from the Tuolumne River watershed during dry years, requiring rationing to a greater degree in San Francisco than previously anticipated to address supply shortages.

However, implementation of the Bay-Delta Plan Amendment is uncertain for several reasons and whether, when, and the form in which the Bay-Delta Plan Amendment would be implemented, and how those amendments could affect SFPUC's water supply, is currently unknown. In acknowledgment of these uncertainties, the 2020 UWMP, and more recently updated, 2023 SFPUC projections, provide future water supply scenarios both with and without the implementation of the Bay-Delta Plan Amendment.

As detailed in the 2023 SFPUC projections, without implementation of the Bay-Delta Plan Amendment, the SFPUC would have adequate supplies to meet projected water demands in normal hydrologic, single dry years, and multiple dry years in 2025, 2030, 2035, 2040, and 2045.[65] Based on the 2023 SFPUC projections, if the Bay-Delta Plan Amendment is implemented, water supplies would be available to meet projected demands in normal years with no shortfalls. However, there would be significant shortfalls in single dry years and multiple dry years through 2045.[66] The shortfalls would result exclusively from supply reductions from implementation of the Bay-Delta Plan Amendment. SFPUC would not have adequate water supplies available to serve the demands from retail water customers during dry and multiple dry years if the Bay-Delta Plan Amendment is implemented.

The supply capacity of the San Francisco Regional Water System, which provides the majority of the city's drinking water (including for the proposed project), far exceeds the potential demand of any single

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63 San Francisco Public Utilities Commission, *Urban Water Management Plan for the City and County of San Francisco*, 2020, https://www.sfpuc.gov/sites/default/files/programs/ UWMP_2020.pdf, accessed September 22, 2025.

64 San Francisco Public Utilities Commission, *Interim Water Demand Projections for the City and County of San Francisco*, 2023, https://www.sfpuc.gov/sites/default/files/documents/ 2023_Interim_Water_Demand_Projections_Sep2023_0.pdf, accessed September 22, 2025.

65 Ibid.

66 Ibid.

development project in San Francisco. No single development project alone in San Francisco would require the development of new or expanded water supply facilities or require the SFPUC to take other actions, such as imposing a higher level of rationing across the city in the event of a supply shortage in dry years. Therefore, a separate project-only analysis is not provided for this topic. The following analysis instead considers whether the proposed project in combination with both existing development and projected growth through 2045 would require new or expanded water supply facilities, the construction or relocation of which could have significant impacts on the environment. It also considers whether a high level of rationing would be required that could have significant cumulative impacts. It is only under this cumulative context that development in San Francisco could have the potential to require new or expanded water supply facilities or require the SFPUC to take other actions, which, in turn, could result in significant physical environmental impacts related to the water supply. If significant cumulative impacts could result, then the analysis considers whether the project would make a considerable contribution to the cumulative impact.

The proposed project includes the reconstruction and modernization of the existing sand processing facility, which would result in substantially similar operational activities as under existing conditions. As detailed in Chapter 2, Project Description and Site Context, water consumption would be dependent on the volume of sand processed, which is expected to fluctuate according to demand. In 2024 the facility processed 189,630 tons of sand and used 9,409,000 gallons of water. Under baseline conditions described in Section 3.A.4, Approach to Baseline Conditions, of the draft EIR, the facility processes approximately 350,000 tons of sand annually, which, based on the ratio of water demand to volume of sand processed, requires approximately 16.9 million gallons of water per year. The proposed project is seeking authorization from the Air District to process a maximum of 800,000 tons of sand annually, which would require approximately 38.9 million gallons of water per year (or approximately 107,000 gallons per day).

Sufficient water supplies are available to serve the project and reasonably foreseeable future development in normal, dry, and multiple dry years unless the Bay-Delta Plan Amendment is implemented. As noted above, there would be significant water supply shortfalls experienced by the SFPUC in single dry years and multiple dry years through 2045 if the Bay-Delta Plan amendment is implemented. However, under all conditions in single or multiple dry years, the proposed project water demand would be a small fraction of the total projected water demand (ranging from 71 to 81 million gallons per day).[67]

The SFPUC has indicated that it is accelerating its efforts to develop additional water supplies and explore other projects that would improve overall water supply resilience through an alternative water supply program. The SFPUC has taken action to fund the study of additional water supply projects, but it has not determined the feasibility of the possible projects and has determined that the identified potential projects would take anywhere from 10 to 30 years or more to implement. The potential impacts that could result from the construction and/or operation of any such water supply facility projects cannot be identified at this time. In any event, under such a worst-case scenario, the demand for the SFPUC to develop new or expanded dry-year water supplies would exist regardless of whether the proposed project is constructed.

Given the long lead times associated with developing additional water supplies, in the event the Bay-Delta Plan Amendment was to take effect sometime after proposed project approval and result in a dry-year shortfall, the expected action of the SFPUC for the next 10 to 30 years (or more) would be limited to requiring increased rationing. The SFPUC has established a process through its 2020 Water Shortage Contingency Plan for actions it would take under circumstances that require rationing. Rationing at the level that might be

[67] Ibid.

required under implementation of the Bay-Delta Plan Amendment would require restrictions on irrigation and other outdoor water uses (e.g., car washing), changes to water use behaviors (e.g., shorter and/or less-frequent showers), and changes to how businesses operate. The level of rationing that would be required of the proposed project is unknown at this time. Both direct and indirect environmental impacts could result from high levels of rationing. However, the water demand attributable to the proposed project compared to citywide demand would not substantially affect the levels of dry-year rationing that would otherwise be required throughout the city. Therefore, the proposed project would not make a considerable contribution to a cumulative environmental impact caused by implementation of the Bay-Delta Plan Amendment. Project impacts related to water supply would be less than significant. Mitigation measures would not be necessary.

Impact UT-4: The proposed project would not generate solid waste in excess of state or local standards, or in excess of the capacity of local infrastructure, or otherwise impair attainment of solid waste reduction goals. ***(Less than Significant)***

In September 2015, the City entered into a landfill disposal agreement with Recology, Inc., for disposal of all solid waste collected in San Francisco. The Recology Hay Road Landfill in Solano County will receive the waste through September 2024 or until 3.4 million tons have been disposed of, whichever occurs first. In June 2024, the City renewed this agreement for a period of six years or until an additional 1.6 million tons have been disposed of, whichever occurs first.[68] The Recology Hay Road Landfill has a maximum permitted capacity of 42 million cubic yards and is permitted to accept up to 3,200 tons per day of solid waste; as of May 2018, 24.9 million cubic yards of disposal capacity was available for solid waste.[69] At the maximum permitted rate, the landfill has the capacity to accommodate solid waste until approximately 2065. The City's contract with the Recology Hay Road Landfill will extend until 2031 or until the City has disposed of 5 million tons of solid waste, whichever occurs first. At that point, the City will either further extend the landfill contract or find and entitle an alternative landfill site.

The proposed project would be required to implement the City's Mandatory Recycling and Composting Ordinance (Ordinance No. 100-09), the objective of which is to minimize San Francisco's landfill trash generation. In compliance with this ordinance, the proposed project would be required to provide convenient facilities for the separation of recyclables, compostables, and landfill trash for its users. Occupants of the project site would be required to separate discarded material.

Construction of the proposed project also would generate demolition and construction waste. The City's Construction and Demolition Debris Recovery Ordinance (Ordinance No. 27-06) prohibits construction and demolition material from being taken to a landfill or placed in the garbage. All mixed debris must be transported by a registered hauler to a registered facility to be processed for recycling, and source-separated material must be taken to a facility that recycles or reuses such materials.

As discussed above, the City has access to adequate landfill capacity through at least 2031 and potentially through 2065. It anticipates that an adequate alternative site will be identified at that point. On that basis,

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[68] San Francisco Planning Department, *Agreement for Disposal of San Francisco Municipal Solid Waste at Recology Hay Road Landfill in Solano County*, Final Negative Declaration, Planning Department Case No. 2014.0653, May 21, 2015, http://sfmea.sfplanning.org/2014.0653E_evised_FND.pdf, accessed September 18, 2025.

[69] Solano County, *Recology Hay Road Landfill Conditional Use Permit Amendment No. 2 Draft Subsequent EIR,* State Clearinghouse Number 2018032031, December 2019, https://files.ceqanet.opr.ca.gov/4110-3/attachment/U3LhwXbuHh2b_Q4mFkxUXUHwdXkKVSYn5_el0-ZYaUUWri944CgEBvuueqJfYQHw_ukr4qoclP1Lutp-0, accessed September 18, 2025.

the City has adequate solid waste capacity for the waste generated by the additional employee proposed by the project, and the impact with respect to landfill capacity would be less than significant. Mitigation measures would not be necessary.

Impact UT-5: The proposed project would comply with federal, state, and local management and reduction statutes and regulations related to solid waste. ***(No Impact)***

The California Integrated Waste Management Act of 1989 (AB 939) requires municipalities to adopt an integrated waste management plan to establish objectives, policies, and programs related to waste disposal, management, source reduction, and recycling. Reports filed by the San Francisco Environment Department show that the city generated approximately 870,000 tons of waste material in 2000. By 2010, that figure decreased to approximately 455,000 tons. Waste diverted from landfills is defined as recycled or composted. San Francisco successfully achieved the State-mandated 50 percent landfill diversion by 2000 and exceeded its goal of 75 percent diversion from landfills and incineration two years early. In September 2018, zero-waste goals were updated to include reducing municipal solid waste generation by 15 percent by 2030 (i.e., reducing what goes to recycling, composting, and trash) and reducing disposal to landfills and incineration by 50 percent by 2030 (i.e., reducing what goes in the black trash bins).[70]

San Francisco's Construction and Demolition Ordinance (Ordinance No. 27-06) requires a minimum of 65 percent of all construction and demolition debris to be recycled and diverted from landfills. Furthermore, San Francisco Ordinance No. 100-09 (the Mandatory Recycling and Composting Ordinance) requires everyone in San Francisco to separate their solid waste into recyclables, compostables, and trash. The proposed project would be subject to and would comply with Ordinance No. 27-06, Ordinance No. 100-09, and all other applicable statutes and regulations related to solid waste. Additionally, the proposed project would be required to follow state and federal regulations related to the disposal of hazardous wastes, and hazardous wastes would be transported to a permitted disposal or recycling facility. The proposed project would comply with all applicable local, state, and federal laws and regulations pertaining to solid waste, and there would be no impact.

Impact C-UT-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on utilities and service systems. ***(Less than Significant)***

Implementation of the proposed project, in combination with cumulative projects in the project vicinity, would result in an incremental increase in water consumption and wastewater and solid waste generation. The SFPUC has accounted for such growth in its water demand and wastewater service projections, and the City has implemented various programs to divert solid waste from landfills. Furthermore, all projects in San Francisco would be required to comply with the regulations described above to reduce waste generation. For these reasons, the proposed project, in combination with cumulative projects, would not result in a significant cumulative impact on utilities and service systems. The impacts would be less than significant. Mitigation measures would not be necessary.

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[70] San Francisco Environment Department, *Frequently Asked Questions (FAQ) about Zero Waste*, 2024, https://www.sfenvironment.org/zero-waste-faqs?repaired, accessed September 7, 2025.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
14. PUBLIC SERVICES. Would the project:					
a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities or the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for public services such as fire protection, police protection, schools, parks, or other public facilities?	☐	☐	☒	☐	☐

The proposed project's impact on parks and open spaces is discussed in Section E.12, Recreation. Impacts on other public services are discussed below.

IMPACTS AND MITIGATION MEASURES

Impact PS-1: The proposed project would not increase the demand for public services to such an extent that construction of new or physically altered facilities would be required. *(Less than Significant)*

The following describes the location of public services in relation to the proposed project site:

- The San Francisco Fire Department (fire department) provides fire suppression services and unified emergency medical services, including basic life support and advanced life support services, in the city. The project site is within the service area of the fire department's Battalion 10. Stations in Battalion 10 include Fire Station 25 (3305 3rd Street), Fire Station 17 (1295 Shafter Avenue), and Fire Station 37 (798 Wisconsin Street). Of these three, Station 25 is the closest fire station, approximately 0.5 mile west of the project site.
- The San Francisco Police Department (police department) provides police protection in the city. Police department services include responding to calls for police assistance, monitoring and managing traffic, and performing general surveillance duties. The project site is within the police department's Bayview District; the closest police station is the Bayview Police Station at 201 Williams Avenue, approximately 1.5 miles southwest of the project site.
- The closest elementary schools are Leola M. Harvard Early Education School at 1520 Oakdale Avenue (approximately 0.75 mile southwest of the project site) and Dr. George Washington Carver Elementary School at 1360 Oakdale Avenue (approximately 0.95 mile south of the project site). The closest middle school is Willie L. Brown Jr. Middle School at 2055 Silver Avenue (approximately 1.20 miles southwest of the project site). The closest high school is C.A.R.E. Bayview at 1601 Lane Street (approximately 1.12 miles southwest of the project site).

As discussed in draft EIR Chapter 2, Project Description, the proposed project would modernize and reconstruct the existing sand processing facility by installing new equipment, constructing a new warehouse, and paving and reconfiguring the site.

The Port would review building plans to ensure that proposed building complies with the latest California Building Code (CBC) requirements regarding fire and life safety, as specified in the San Francisco Fire Code. These requirements include measures related to emergency access and egress; fire hydrants and sprinkler systems; fire-rated designs, construction, and materials; restrictions on occupant loads; emergency lighting; smoke alarms; and mechanical smoke control and emergency notification systems. The project sponsors would work with the Port's fire department staff to determine utility and access requirements for fire protection and emergency services at the project site. Adherence to San Francisco Fire Code requirements as part of the project design would minimize demand for future fire protection services.

The project does not propose residential units, nor would there be a significant increase in the number of site visitors or employees who work at the site. Six employees would be anticipated during operation of the project compared to five under current conditions. As such, the proposed project would not be expected to substantially increase demand for fire protection or police services and would not result in the need for new or physically altered fire protection or police facilities. In addition, the proposed project would not include any residential units and, thus, would not directly contribute to school-aged children or the demand for school services. Therefore, implementation of the proposed project would not necessitate the need for new school facilities or the expansion of existing school facilities, which could result in significant environmental impacts.

Because the proposed project would not include new residential units, increased demand for other government services and facilities, such as public libraries, would not be anticipated with proposed project implementation. Although some employees may use government services and facilities, such use would not be expected to rise to a level that could not be accommodated by existing facilities.

For the reasons described above, the proposed project would not be expected to substantially increase demand for other public services and would not result in the need for new or physically altered public service facilities. Therefore, impacts on other public services would be less than significant. Mitigation measures would not be necessary.

Impact C-PS-1: The proposed project, combined with cumulative projects, would not result in significant cumulative impacts on police, fire, and school district services such that new or physically altered facilities, the construction of which could cause significant environmental impacts, would be required in order to maintain acceptable levels of service. ***(Less than Significant)***

The geographic context for cumulative fire, police, and library impacts are the police, fire, and library service areas, while the geographic context for cumulative school impacts is the school district service area. Cumulative development projects within a 1,000-meter radius of the project site are identified in draft EIR p. 3-8, and mapped in Figure 3-1, Cumulative Projects within a 1,000-Meter Radius of the Project Site, p. 3-12. The cumulative projects include the Pier 94 Grassland Meadow Enhancements, Blue Greenway Improvements, Amador Street Infrastructure Improvements, Pier 80 Subsidence Repairs, Pier 94/96 Seismic Improvements, CEMEX Construction Materials Pacific (Pier 92), Pier 90 Building and Wharf Demolition Project, Islais Creek Bridge Projects, and 50 Quint Street. These projects consist of infrastructure improvements and commercial development in the project vicinity and may result in an intensification of land use. The fire and police departments, the school district, libraries, and other city agencies respond to growth and other changing service needs through ongoing analysis of applicable metrics, such as staffing,

capacity, response times, and call volumes. As a result, projected future development would not result in any service gap in citywide police, fire, and emergency medical services.

The proposed project and cumulative projects would not include any residential units and, therefore, would not create a significant cumulative impact related to demand for school services and libraries. Therefore, the proposed project would not combine with cumulative projects to create a significant cumulative impact on public services. This impact would be less than significant. Mitigation measures would not be necessary.

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Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
15. BIOLOGICAL RESOURCES. Would the project:					
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands (including, but not limited to, marshes, vernal pools, coastal areas) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒	☐
f) Conflict with the provisions of an adopted habitat conservation plan, natural community conservation plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☐	☒

The project site is not part of, or near, an area covered by an adopted or proposed habitat conservation plan (HCP) or natural community conservation plan (NCCP) or any other local, regional, or state HCP. Therefore, Topic E.15.f is not applicable to the project and is not discussed further.

IMPACTS AND MITIGATION MEASURES

Impact BI-1: The proposed project would not have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. *(Less than Significant)*

Wildlife species are protected under the federal Endangered Species Act, the Migratory Bird Treaty Act (MBTA), the California Endangered Species Act, and regulations concerning California Species of Special Concern. A qualified biologist conducted a site visit of the project site and adjacent Pier 94 property on March 26, 2025, and reviewed the California Natural Diversity Database (CNDDB),[71] California Native Plant Society (CNPS),[72] USFWS Information for Planning and Conservation (IPaC),[73] and iNaturalist[74] for occurrences of special-status plant and wildlife species in proximity to the project site. Biologists analyzed the likelihood of special-status species to occur on and in the vicinity of the project site based on known species occurrences and natural history parameters, including, but not limited to, species' range, habitat (including size and distance from other suitable habitat), foraging needs, migration routes, and reproductive requirements. Queries of the CNDDB, CNPS, and IPaC regarding species with potential to occur in the region are included in Appendix E.

Potential Effects Onsite

No candidate, sensitive, or special-status plant or wildlife species are anticipated to occur on the project site with the exception of resident and migratory nesting birds protected under state law (i.e., California Fish and Game Code Sections 3503, 3503.5 and 3513) and federal law (i.e., MBTA) because the project site is comprised of disturbed, developed, and ruderal habitat; has ongoing operations; has no empty or abandoned buildings; has sparse vegetation that is predominantly non-native; has no natural or sensitive communities present; and has no natural waterbodies. Bare ground, vegetation, and structures (e.g., processing equipment, office and storage structures) on the project site could support nesting resident and migratory birds. Bare ground, especially near waterbodies like the Bay, offers suitable nesting habitat for birds species including killdeer (Charadrius vociferus); low growing vegetation such as grasses and weeds offers suitable nesting habitat for bird species including song sparrow (*Melospiza melodia*); structures and processing equipment offer suitable nesting habitat for bird species including black phoebe (*Sayornis nigricans*), cliff swallow (*Petrochelidon pyrrhonota*), and house finch (*Haemorhous mexicanus*); and the adjacent offsite radio tower offers suitable nesting habitat for birds including common raven (*Corvus corax*) and red-tailed hawk (*Buteo jamaicensis*). If construction occurs during the nesting season (January 15 to September 15) in areas with active nests, construction activities could result in the direct mortality of adult or young birds, the destruction of active nests, nest abandonment, and/or reduced hatching or fledging success, which would be considered a significant impact. Because the proposed project would comply with state (i.e., California Fish and Game Code sections 3503, 3503.5 and 3513) and federal (i.e., MBTA) laws

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71 California Department of Fish and Wildlife, CNDDB RareFind records search within 2 miles of the project site, RareFind Version 5.3.0, https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data, accessed: August 28, 2025.

72 California Native Plant Society, *Online Inventory of Rare and Endangered Plants of California*, records search of USGS 7.5-minute quadrangles, San Francisco North (371222) and San Francisco South (3712264), version v-9.5.1a, https://rareplants.cnps.org/Search/Advanced, accessed: August 28, 2025.

73 U.S. Fish and Wildlife Service, *Information for Planning and Consultation (IPaC),* https://ipac.ecosphere.fws.gov/, accessed: August 28, 2025.

74 iNaturalist, https://www.inaturalist.org/, accessed: August 28, 2025.

protecting birds, the project's impact on nesting birds during construction would be less than significant. Mitigation measures would not be necessary.

Potential Effects Offsite

Although special-status bird species are not expected on the project site, there is potential for several special-status bird species nearby in the Islais Creek Channel and Pier 94 open space, many of which have been documented at these locations (e.g., burrowing owl, grasshopper sparrow, least tern, northern harrier, short-eared owl, and white-tailed kite).[75] Islais Creek Channel, located immediately north of the project site, comprises open water habitat and provides foraging habitat for birds; the Pier 94 open space, located immediately east of the project site, comprises restored tidal salt marsh and upland habitat, which provides foraging and nesting habitats for birds. Generally, increased levels of noise on a project site from construction activities or during operations can affect bird behavior adjacent to a project site. As detailed in Section E.7, Noise, the simultaneous operation of a loader and a truck from operation of the site produces a reference noise level of 85 dBA 1-hour Leq at 50 feet. This represents a worst-case operating condition with equipment operating at full power under both existing conditions and future conditions with operation of the redeveloped site. Because the noise level from operations would be similar to existing conditions, the increase in throughput would not result in a noticeable increase in noise. Also detailed in Section E.7, Noise, the simultaneous operation of a paver and roller during construction of the project produces a reference noise level of 88 dBA L_{eq} at 50 feet. This represents a worst-case operating condition with equipment operating at full power during construction; however, this would occur only intermittently during paving activities. In comparison, combined equipment noise generated by activities during construction would produce an increase in noise levels of 3 dBA above existing and future operating levels. As stated in Section E.7, Noise, an increase of 3 dB is considered "just noticeable" and therefore not considered significant. Because increased noise levels during construction are not considered significant and noise from operations would be at levels similar to existing conditions, it would be anticipated that foraging and nesting birds would be acclimated to noise during construction and operations. Due to existing barge activity associated with current project operations, as well as other non-project cargo ship and barge traffic in Islais Creek Channel, foraging birds in the channel and shoreline are most likely acclimated to regular marine vessel activity. If open water or shoreline foraging behaviors are affected by increased barge activity in the channel during operation due to increased throughput, there is other foraging habitat farther west in the channel in the open bay and at Heron's Head Park and India Basin Shoreline Park. Therefore, impacts on special-status bird species in addition to native and migratory birds protected under the California Fish and Game Code (sections 3503, 3503.5 and 3513) and the MBTA during construction and operation outside the project site would be less than significant. Mitigation measures would not be necessary.

Although no candidate, sensitive, or special-status fish species are anticipated to occur on the project site, there is potential for special-status fish species including green sturgeon (*Acipenser medirostris*), longfin smelt (*Spirinchus thaleichthys*), and steelhead (Oncorhynchus mykiss) in Islais Creek Channel and the Bay. The project would not result in direct impacts on these fish species; however, shading from increased barge activity in Islais Creek Channel could affect special-status fish species during operations. The proposed project would increase the use of barge trips such that there would be 2.3 times more barge trips than under the existing conditions (up to 250 barge deliveries during any consecutive 12-month period). Increased barge activity would result in increased shading of open water habitat in Islais Creek Channel during operation.

[75] *eBird, An Online Database of Bird Distribution and Abundance*, 2025, Cornell Lab of Ornithology, Ithaca, NY. Available: https://ebird.org/hotspot/L794465/bird-list?yr=cur, accessed September 19, 2025.

Although shading can reduce the amount of energy available for photosynthesis by phytoplankton, tidal fluctuations and currents would move the water mass through the area. Therefore, planktonic organisms in the water would move through the area and are not expected to reside beneath the barges for an extended period of time. The reduction of photosynthesis from increased barge activity during operations is not expected to measurably reduce phytoplankton densities in this area or to result in food-chain effects on zooplankton species upon which fish species may feed. Additionally, shading from barges can deflect or delay fish movement, reduce the production and availability of prey resources, and increase the predation rates of certain fishes. The shade that would be created by barges during operations is relatively small compared to the size of the open water habitat in the Islais Creek Channel and the Bay; therefore, behavior is not anticipated to be affected because fish could move to non-shaded locations in Islais Creek Channel and the Bay. Because there would be no direct impacts on fish and increased shading is not anticipated to affect food-chain effects or fish behavior, the project's impact on special-status fish species during operation would be less than significant. Mitigation measures would not be necessary.

Although no haul-outs for marine mammals are located along the shore at Islais Creek Channel and at Pier 94, there is potential for marine mammals protected under the Marine Mammal Protection Act (MMPA), such as Pacific harbor seal (*Phoca vitulina richardii*) and California sea lion (Zalophus californianus), to use open water habitats near the project site including Islais Creek Channel for foraging. Because increased noise levels during construction are not considered significant, and noise from operations would be at levels similar to existing conditions, it is anticipated that foraging behaviors would be acclimated to noise during construction and operations. Due to existing barge activity associated with current project operations, as well as other non-project cargo ship and barge traffic in Islais Creek Channel, marine mammals in the area are most likely acclimated to regular marine vessel activity. If marine mammal foraging behaviors are affected by increased barge activity in the channel during operation due to increased throughput, there is other foraging habitat located farther west in the channel and in the bay. Therefore, impacts on marine mammals protected by the MMPA during operation would be less than significant. Mitigation measures would not be necessary.

Although no special-status plant species are anticipated to occur on the project site, special-status plant species are known in the open space at Pier 94. During the site visit, the biologist observed California seablite (*Suaeda californica*), a federally listed endangered species, in the Pier 94 wetlands. The project would not result in direct impacts on such plant species; however, the construction and operation of the project would result in increased localized air pollutant emissions (see draft EIR Section 3.C Air Quality) that could indirectly impact special-status plants located in Pier 94 wetlands. Studies have shown that dust, PM2.5, and other types of emissions affect the metabolic processes of plants, however the threshold at which dust and emissions may affect individual special-status plant species and sensitive plant communities (such as pickleweed mats) is unknown. It is evident from the success of restoration efforts and high plant vitality observed at Pier 94 that existing levels of dust and other emissions on the project site from the surrounding industrial uses have no significant impact on vegetation outside the project area. It is also evident that pickleweed mat habitat can endure high concentrations of dust and emissions as high-quality pickleweed habitat occurs adjacent to high-volume roadways with extreme dust and emission concentrations including at the San Pablo Bay National Wildlife Refuge and Napa-Sonoma Marshes Wildlife Area adjacent to Highway 37, at Bair Island adjacent to Highway 101, south of the San Mateo-Hayward Bridge toll plaza adjacent to Highway 92, and east and west of the Dumbarton Bridge adjacent to Highway 84. During construction, the project would comply with San Francisco Municipal Code article 22B, Construction Dust Control Requirements, and implement site-specific measures to reduce dust and other emissions that affect air quality (draft EIR Section 3.C, Air Quality). During operations, project design elements including paving

where mobile equipment will travel, installing enhanced dust control measures including retrofitting two existing conveyors and replacing four existing conveyors with covers, covering the finished material stockpile and truck loading areas would limit dust and other emissions that impact air quality. No direct impacts on special-status plant species would occur. Pickleweed mat habitat and associated plants can endure high concentrations of dust and emissions, and implementation of project design elements would limit the proposed project's air emissions; therefore, the project's impact on special-status plant species during construction and operation would be less than significant. Mitigation measures would not be necessary.

Although special-status plant species occur at Pier 94, no milkweed species (host plants for monarch butterfly) are anticipated. No milkweed plants were observed in Pier 94 during surveys conducted prior to the upland habitat enhancement conducted in 2013[76] or included on the propagation list for upland habitat enhancement.[77] There have been no iNaturalist observations for monarch or milkweed at Pier 94 (although there are 27 butterfly observations and 886 plant observations at Pier 94).[78] Therefore, the project would have no impact on monarch butterfly from increased localized air pollutant emissions.

Impact BI-2: The proposed project would not have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service. ***(Less than Significant)***

No riparian habitat or other sensitive natural communities are present on the project site. The site is mostly developed and disturbed habitat. Scattered patches of ruderal vegetation occur around the project site, including near the Islais Creek Channel shoreline. The vegetation on the project site is not considered a sensitive natural community as all plant species observed in the project site during the site visit were primarily non-native species including ripgut brome (*Bromus diandrus*), iceplant (*Carpobrotus edulis*), Italian thistle (*Carduus pycnocephalus*), brass buttons (Cotul*a coronopifo*lia), bristly oxtongue (*Helminthotheca echioides*), California burclover (Medicago polymorpha), Bermuda buttercup (*Oxalis pes-caprae*), crown daisy (*Glebionis coronaria*), and annual yellow sweetclover (*Melilotus indicus*). The only native species observed on the project site was California poppy (*Eschscholzia californica*).

Although no sensitive natural communities are present on the project site, sensitive natural communities occur, including pickleweed mats in the open space at Pier 94 adjacent to but outside of the project site. Upland habitat present just outside the northeast and east boundary of the project site and wetland habitat farther east adjacent to open water of the Bay are comprised by a mix of native and non-native species. During the site visit, native species observed in the upland habitat outside of the project site include coyote brush (*Baccharis pilularis*), western blue-eyed grass (*Sisyrinchium bellum*), California mugwort (*Artemisia douglasiana*), Coastal bush lupine (*Lupinus arboreus*), coast buckwheat (*Eriogonum latifolium*), common yarrow (Achillea millefolium), California poppy (*Eschscholzia californica*), California sagebrush (Artemisia californica); and non-native species observed include prickly sowthistle (*Sonchus asper*), wall barley

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[76] Golden Gate Audubon Society, *Pier 94 Upland Baseline Vegetation and Photographic Monitoring Report,* October 20, 2012, www.ecoatlas.org/upfiles/109/San%20Francisco%20Pier%2094%20Monitoring%20Report20130220%20%282%29.pdf, accessed September 18, 2025.

[77] Golden Gate Audubon Society, *San Francisco Pier 94 2013 Construction Report and Native Plant Restoration Plan*, December 15, 2013, www.ecoatlas.org/upfiles/110/San%20Francisco%20Pier%2094%202013%20Construction%20Report%20and%20Restoration%20Plan%20201312 17.doc%20%281%29.pdf, accessed September 18, 2025.

[78] iNaturalist search for observations of monarch and milkweed, 2025, https://www.inaturalist.org, accessed September 19, 2025.

(Hordeum murinum), prickly lettuce (*Lactuca serriola*), annual yellow sweetclover (*Melilotus indicus*), fennel (Foeniculum vulgare), and redstem stork's-bill (*Erodium cicutarium*). Native species observed in the marsh habitat include pickleweed (Salicornia pacifica), saltgrass (*Distichlis spicata*), alkali heath (Frankenia salina), marsh jaumea (*Jaumea carnosa*), California seablite (*Suaeda californica*), and western marsh rosemary (Limonium californicum); and nonnative species observed include, annual yellow sweetclover (*Melilotus indicus*), wild radish (*Raphanus raphanistrum*), brass buttons (*Cotula coronopifolia*), and New Zealand spinach (*Tetragonia tetragonoides*).

The project would not result in any direct impacts on riparian habitat or other sensitive natural communities; however, indirect impacts on sensitive natural communities located in the open space at Pier 94 could occur from the proposed project's air emissions. Refer to Impact BI-1, which details how project design elements would limit air emissions resulting from project implementation. Because there would be no direct impacts on riparian habitat or other sensitive natural communities and the project's air emissions on sensitive natural communities at Pier 94 would be reduced to a less-than-significant level with implementation of the project's design elements, the project's impact on sensitive natural communities during construction and operation would be less than significant. Mitigation measures would not be necessary.

Impact BI-3: The proposed project would not have a substantial adverse effect on federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means. *(Less than Significant)*

No federally protected wetlands are present on the project site.[79] The site is mostly developed and disturbed habitat. The settling ponds that occur on the project site are not considered protected wetlands; the ponds have no emergent vegetation and vegetation around the ponds are non-native species including those plant species listed above in Impact BI-2. Although no wetlands are present on the project site, wetland habitat is present in the Pier 94 open space. As stated in Impact BI-2, this open space is restored tidal salt marsh habitat with adjacent upland habitat. Upland habitat separates the project site and wetlands at Pier 94; wetland habitat occurs as close as approximately 105 feet from the project site near the open water of the Bay.[80]

The project would not result in any direct impacts on federally protected wetlands; however, indirect impacts on wetlands in the open space at Pier 94 could occur from the proposed project's air emissions. Refer to Impact BI-1, which details how project design elements would limit air emissions resulting from project implementation. Because there would be no direct impacts on wetlands and impacts from the project's air emissions on wetlands at Pier 94 would be reduced to a less-than-significant level with implementation of the project's design elements, the project's impact on protected wetlands during construction and operation would be less than significant. Mitigation measures would not be necessary.

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[79] U.S. Fish and Wildlife Service, *National Wetland Inventory Wetland Mapper*, 2025, https://www.fws.gov/wetlands/, accessed August 26, 2025.

[80] Ibid.

Impact BI-4: The proposed project would not interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. ***(Less than Significant)***

No wetlands or running waters are present on the project site; therefore, the project would have no impact on fish movement. Because project activities would occur within the developed footprint of an operating sand processing facility, any common urban-adapted terrestrial species, including migratory birds, that currently move through the project site would be able to do so during construction and operation; therefore, impacts on movement of terrestrial species would be less than significant.

Wildlife corridors are described as pathways or habitat linkages that connect discrete areas of natural open space that would otherwise be separated or fragmented by topography, changes in vegetation, or other natural or man-made obstacles, such as urbanization. Fragmentation of natural habitat creates isolated "islands" of habitat that may not provide sufficient area or resources to accommodate sustainable populations for a number of species, adversely affecting both genetic and species diversity. The project site does not occur between areas of natural open space as urban land use occurs west and south of the project. Approximately 1.3 acres of ruderal habitat are located northwest of the project adjacent to the Islais Creek Channel shoreline and approximately 11.5 acres of open space are located at Pier 94. As project activities would not be occurring at or near the Islais Creek Channel shoreline, the project would not interfere with movement of terrestrial species between these two areas. Nonetheless, the project site is within the Pacific Flyway, a north/south oriented-path stretching from Alaska to Patagonia, that many species of birds migrate along as they travel between breeding and overwintering locations.

Bird strikes on glass windows, which are often not readily obvious to birds because of visually disorienting lights, contribute substantially to avian mortality in urban areas, estimated to be as high as 1 to 5 percent of all bird deaths annually.[81] Bird strikes are exacerbated by artificial nocturnal lighting emanating from large buildings, particularly for nocturnal migrants and migrating songbirds.[82] The City has adopted guidelines to address this issue and provided regulations for bird-safe design within San Francisco Planning Code section 139, Standards for Bird-Safe Buildings, which establishes building design standards to reduce avian mortality rates associated with bird strikes.[83] As the project site is located within 300 feet of an urban bird refuge,[84] the standards concerning location related-hazards are applicable to the proposed project. As discussed in Impact BI-1, construction activities have the potential to result in direct mortality for nesting birds, which would be a significant impact. By complying with the Standards for Bird-Safe Buildings, including the lighting design (i.e., minimal lighting, shielded lighting, no uplighting, and no searchlights), and with state and federal laws protecting birds, impacts on the movement of native resident or migratory birds and nursery sites during construction and operation would be less than significant. Mitigation measures would not be necessary.

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81 San Francisco Planning Department, *Standards for Bird-Safe Buildings*, adopted: July 14, 2011, https://sfplanning.org/standards-bird-safe-buildings, accessed August 27, 2025.

82 Ogden, L. E., *Collision Course: The Hazards of Lighted Structures and Windows to Migrating Birds, Special Report for the World Wildlife Fund and the Fatal Light Awareness Program*, September 1996, https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1002&context=flap, accessed August 27, 2025.

83 San Francisco Planning Department, *Standards for Bird-Safe Buildings*, adopted: July 14, 2011, https://sfplanning.org/standards-bird-safe-buildings, accessed August 27, 2025.

84 San Francisco Planning Department, Urban Bird Refuge poster, published July 2014, https://sfplanning.org/sites/default/files/resources/2018-08/Urban%20Bird%20Refuge.pdf, accessed August 27, 2025.

Impact BI-5: The proposed project would not conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance. ***(No impact)***

The City of San Franciso's Urban Forestry Ordinance (article 16 of the Public Works Code) provides protection to significant trees on private property and regulates street tree planting and removal. Because there are no trees on the project site and no tree removal is planned, the project will not conflict with this ordinance and there will be no impact.

The City of San Francisco's Standards for Bird-Safe Buildings (article 1.2 section 139 of the San Francisco Planning Code) provides protection to birds. The purpose of section 139 is to establish Bird-Safe Standards for new building construction and replacement facades to reduce bird mortality from circumstances that are known to pose a high risk to birds and considered to be bird hazards. The two circumstances regulated by this section are location-related hazards, where the siting of a structure creates increased risk to birds; and feature-related hazards, which may create increased risk to birds regardless of where the structure is located. The project site is located within 300 feet of an urban bird refuge,[85] so the standards concerning location-related hazards are applicable to the project. As the project is being designed to be consistent with this code, the project will not conflict with this ordinance and there will be no impact.

Impact C-BI-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on biological resources. ***(Less than Significant)***

Cumulative development in the project vicinity (within a 1,000-meter radius of the project site) includes projects that are either under construction, or those for which the planning department or Air District has a project or permit application on file (see draft EIR p. 3-8, and mapped in Figure 3-1, Cumulative Projects within a 1,000-Meter Radius of the Project Site, p. 3-12). Of the projects, only the CEMEX Construction Materials Pacific (Pier 92) Project, located immediate west of the proposed project, could involve an increase of in-water operational activity, similar to the proposed project (i.e., increased barge traffic).

The proposed project would have no impact with respect to a conflict with local policies or ordinances protecting biological resources (such as a tree preservation policy or ordinance). Because the project would have no impact, the project does not have the potential to combine with cumulative projects. Therefore, this resource topic is not discussed further.

Special-Status Species and Nursery Sites (including Nesting Birds)

No candidate, sensitive, or special-status plant or wildlife species are anticipated to occur on the project site with the exception of resident and migratory nesting birds protected under state law (i.e., California Fish and Game Code sections 3503, 3503.5 and 3513) and federal law (i.e., MBTA). If project construction occurs during the nesting season (January 15 to August 15), construction activities could result in impacts on nesting birds. It is reasonable to expect that there could be similar impacts on nesting birds from nearby development, including the cumulative projects listed in Table 3-1 and Figure 3-1. However, all projects would be required to comply with the California Fish and Game Code (sections 3503, 3503.5 and 3513) and the MBTA to reduce potential impacts on nesting birds during construction. The proposed project and the CEMEX Construction

[85] Ibid.

Materials Pacific (Pier 92) Project have the potential to affect bird foraging behavior during operations from increased barge activity in the Islais Creek Channel. However, if foraging behaviors are affected, there is other foraging habitat farther west in the Islais Creek Channel, in the open Bay, and at Heron's Head Park and India Basin Shoreline Park. Because the proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on special-status bird species, in addition to native and migratory birds protected under the California Fish and Game Code (sections 3503, 3503.5 and 3513) and the MBTA, during construction and operation, the impact on these resources would be less than significant with mitigation. Mitigation measures would not be necessary.

Special-Status Fish

Although there is no potential for candidate, sensitive, or special-status fish species to occur on the project site, there is potential for impacts related to shading from increased barge activity in Islais Creek Channel, which could affect fish species in nearby open water habitat. It is reasonable to expect that there could be similar impacts on fish during operation from nearby development, including the CEMEX Construction Materials Pacific (Pier 92) Project. As discussed in Impact BI-1, due to the movement of water in the Bay, the relative size of vessels in comparison to the Bay, and the amount of feeding habitat in the Bay, increased shading from large vessels during operation is not anticipated to affect the food chain or the behavior of fish. Because the proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on special-status fish during operation, the impact on this resource would be less than significant. Mitigation measures would not be necessary.

Special-Status Plant Species, Sensitive Natural Communities, and Wetlands

Although no special-status species, sensitive natural communities, and federal wetlands occur on the project site, there is potential for impacts from increased localized air pollutant emissions on special-status plants, sensitive natural communities, and wetlands within the adjacent Pier 94 open space. It is reasonable to expect that there could be similar impacts on special-status plant species, sensitive natural communities, and wetlands from nearby development, including the CEMEX Construction Materials Pacific (Pier 92) Project. However, all nearby development in San Francisco would be required to comply with City and California air quality standards, including those specified in article 22B of the San Francisco Municipal Code, to mitigating potential impacts. Because the proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on special-status plants, sensitive natural communities, and wetlands during construction and operation, the impact on these resources would be less than significant. Mitigation measures would not be necessary.

Marine Mammals

Although no haul-outs for marine mammals are located near the project site and it is anticipated that marine mammals would be acclimated to noise during construction and operation of the project, there is potential for impacts from increased barge activity during operation on marine mammal foraging behavior. It is reasonable to expect that there could be similar impacts on marine mammals from nearby development, including the CEMEX Construction Materials Pacific (Pier 92) Project. If operational activities affect marine mammal foraging behavior, there is other open water habitat located farther west in the channel and in the Bay that could be used for foraging. In addition, all future development would be required to comply with the MMPA to mitigate potential impacts on marine mammals. Because the proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on marine mammals during

operation, the impact on this resource would be less than significant. Mitigation measures would not be necessary.

Wildlife Movement Corridors (including Birds)

Because the project is within proximity to an urban bird refuge, operation of the project could result in impacts on resident and migratory bird movement during operations. Since establishment of urban bird refuges and adoption of San Francisco's Standards for Bird-Safe Buildings, projects have been required to incorporate bird-safe building standards (e.g., lighting designs) to prevent hazards for resident and migratory birds. All nearby development in the city would be required to comply with the San Francisco's Standards for Bird-Safe Buildings to mitigate potential impacts on resident and migratory birds. Because the proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on wildlife movement corridors during construction and operation, the impact on this resource topic would be less than significant. Mitigation measures would not be necessary.

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Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
16. GEOLOGY AND SOILS. Would the project:					
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:					
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐	☐
iii) Seismically related ground failure, including liquefaction?	☐	☐	☒	☐	☐
iv) Landslides?	☐	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐	☐
c) Be located on geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse?	☐	☐	☒	☐	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☒	☐	☐

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒	☐
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact GE-1: The proposed project would not directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving fault rupture, strong seismic ground shaking, seismically induced ground failure, including liquefaction, or landslides. *(Less than Significant)*

Surface fault rupture is the offset or rupturing of the ground surface by relative displacement across a fault during an earthquake. According to the 2024 *Geotechnical Report, Proposed Sand Processing Plant, Pier 92, San Francisco, California*, prepared by Kleinfelder (Appendix F) for the proposed project, the Pier 92 site is not within an Alquist-Priolo Earthquake Fault Zone.[86] The closest active fault to the proposed project is the San Andreas fault, approximately 8.2 miles to the southwest. According to applicable geologic and seismologic data evaluated during the preparation of the geotechnical report, there are no mapped faults within or near the project site. Furthermore, features associated with active faults were not observed during a June 2024 site reconnaissance study conducted as part of the geotechnical evaluation. Because there are no mapped faults traversing the project site, potential impacts associated with fault rupture (associated with a known fault) are considered negligible. No impact would occur.

The project area lies within a region that is seismically active. In the event of an earthquake, seismic ground shaking could occur in the project area, resulting in structural damage to the project. The geotechnical report determined that strong ground shaking due to moderate to major earthquakes generated on regional faults can occur onsite. In addition to the San Andreas fault, the next closest regional faults to the project site (and their distances to the site) are the Hayward (10.6 miles), San Gregorio (12.0 miles), Pilarcitos (12.2 miles), and Point Reyes (12.6 miles) faults. Significant regional faults near the project are listed in Table 4-1 of the 2024 geotechnical report. The project would implement recommendations found in the geotechnical investigation (recommendations are listed in the geotechnical report Section 6.0, Conclusions and Recommendations), including those related to seismic designs, grading, site preparation, and foundations, and would adhere to the current California Building Code (CBC), the Port Building Standards Codes, local ordinances, and laws regulating construction, thereby minimizing potential impacts associated with seismic ground shaking. Compliance with these laws and regulations would ensure impacts related to seismic ground shaking would be less than significant. Mitigation measures would not be necessary.

[86] Alquist-Priolo earthquake fault zones are regulatory zones surrounding the surface traces of active faults in California. Wherever an active fault exists, if it has the potential for surface rupture, a structure for human occupancy cannot be placed over the fault and must be a minimum distance from the fault (generally 50 feet).

Liquefaction occurs when saturated, low-density loose materials (e.g., sand or silty sand) are weakened and transformed from a solid to a near-liquid state as a result of increased pore water pressure. The increase in pressure is caused by strong ground motion from an earthquake. Liquefaction more often occurs in areas underlain by silts and fine sands and where shallow groundwater exists. Factors known to influence liquefaction potential include the composition and thickness of the soil layers, grain size, relative density, groundwater level, degree of saturation, and both the intensity and duration of ground shaking. According to the geotechnical report, the site is within the area covered by the California Geological Survey (CGS) Earthquake Zones of Required Investigation map,[87] the Hunters Point quadrangle, and the South San Francisco quadrangle. This indicates that the project site is in an area susceptible to seismically induced liquefaction. Moreover, the site is underlain by artificial fill over estuarine mud with "very high" susceptibility to liquefaction. During design, the project would consider the propensity for liquefaction in the area, implement applicable recommendations found in the geotechnical investigation, and adhere to the current CBC and local ordinances and laws regulating construction, thereby minimizing potential impacts associated with geologic hazards, including those associated with liquefaction. Impacts would be less than significant. Mitigation measures would not be necessary.

Landslides, slope failures, and mudflows generally occur where slopes are steep and/or earth materials are too weak to support themselves. Earthquake-induced landslides may also occur because of seismic ground shaking. However, the site is not within a CGS Earthquake Zone of Required Investigation for landslides. Given the nature of the proposed project (i.e., reconstruction and modernization of an existing facility), landslides as a result of the project are not considered to be a significant risk. Moreover, as stated previously, the project would implement applicable recommendations found in the geotechnical investigation and adhere to the updated (and current) CBC, Port Building Code, as well as local ordinances and laws regulating construction, further reducing risks associated with potential seismically induced phenomena. No impact would occur.

Impact GE-2: The proposed project would not result in substantial erosion or loss of topsoil. *(Less than Significant)*

Erosion is a condition that could adversely affect development on any site. Construction activities could exacerbate erosion conditions by exposing soils and adding water to the soil from irrigation and runoff from new impervious surfaces. Any project involving grading of an area greater than 1 acre (or less than 1 acre but part of a larger common plan of development) would be required to obtain NPDES coverage under the NPDES General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities, Order No. 2022-0057-DWQ (Construction General Permit [CGP]).[88] Construction activities covered under the CGP include clearing, grading, and disturbances to the ground, such as stockpiling or excavation. The CGP would require development and implementation a stormwater pollution prevention plan (SWPPP) that includes best management practices (BMPs) to regulate stormwater runoff, including measures to prevent soil erosion[89] and loss of topsoil. Compliance with permit requirements, along with implementation

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87 California Geological Survey, *Earthquake Zones of Required Investigation*, 2025, https://maps.conservation.ca.gov/cgs/informationwarehouse/eqzapp/, accessed August 28, 2025.

88 State Water Resources Control Board, *Welcome to the Construction Stormwater Program*, 2022, https://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.html, accessed August 28, 2025.

89 Typical construction BMPs can include silt fences, straw waddles, sediment traps, or gravel sandbag barriers.

of BMPs, would minimize the erosion potential. Impacts would be less than significant. Mitigation measures would not be necessary.

Impact GE-3: The proposed project would not result in onsite or offsite landslide, lateral spreading, subsidence, liquefaction, or collapse by being located on a geologic unit or soil that is unstable, or that could become unstable. *(Less than Significant)*

For a detailed discussion of landslide and liquefaction hazards, see Impact GE-1, above.

As mentioned under Impact GE-1, the project site is in an area susceptible to liquefaction. As such, liquefaction of onsite soils could result in some localized seismically induced settlement. The degree of settlement would depend on soil characteristics, topography, and the magnitude and duration of the earthquake. Based on the soil sample results obtained during preparation of the geotechnical report, seismically induced ground surface settlement onsite would be approximately 1 to 2 inches following a strong earthquake. According to the geotechnical report, ground settlement would result in hazardous conditions if deep foundation systems, extending through fill and underlying soils into older sediments and weathered bedrock, were a part of the project. However, as mentioned in Chapter 2, *Project Description and Site Context*, the concrete footings that would support the storage warehouse and equipment would not extend more than 5 feet below the ground surface.

Lateral spreading is associated with liquefaction and typically occurs adjacent to free faces such as slopes and creek channels. When coherent material, either bedrock or soil, rests on materials that liquefy, the upper units may undergo fracturing and extension, then subside, translate, rotate, disintegrate, or liquefy and flow. According to the geotechnical report, the site is relatively flat and, at a minimum, about 150 feet from the nearest open face. Thus, the potential for lateral spreading to affect the project site is considered low.

Land subsidence is a gradual settling or sudden sinking of the Earth's surface, owing to subsurface movement of earth materials. The principal causes of subsidence are aquifer-system compaction, drainage within organic soils, underground mining, hydrocompaction, natural compaction, sinkholes, and thawing permafrost. According to the U.S. Geological Survey (USGS) Areas of Land Subsidence in California map,[90] the project site is not in an area historically known to be prone to subsidence.

Although potential impacts associated with soil or geologic instability are considered unlikely, the project would implement applicable recommendations found in the geotechnical investigation and adhere to the updated (and current) CBC as well as local ordinances and laws regulating construction, further reducing risks associated with potential seismically induced phenomena. Impacts would be less than significant. Mitigation measures would not be necessary.

Impact GE-4: The proposed project would not create substantial risks to life or property by being located on expansive soils. *(Less than Significant)*

Expansive soils expand when they get wet and shrink as they dry out. Upward pressure can increase when these expansive soils swell, which may result in detrimental effects for structures and surface improvements

[90] U.S. Geological Survey, *Areas of Land Subsidence in California*, 2025, https://ca.water.usgs.gov/land_subsidence/california-subsidence-areas.html, accessed August 28, 2025.

if not property mitigated. As stated in the geotechnical report, the predominantly clayey near-surface soils located onsite are expected to have plasticity characteristics that would make them susceptible to expansive behavior; such soils would not be suitable for reuse as engineered fill. However, they may be used as general fill where the fill does not support foundations or pavement directly or where the fill is not placed behind retaining walls or used as backfill against foundations.

Although soils in the project area contain clay and thus some potential for expansion, the recommendations found in the geotechnical report would be followed during project implementation. In addition, the proposed project would adhere to the updated (and current) CBC, Port building code, as well as local ordinances and laws regulating construction, further reducing risks associated with implementation of the proposed project on expansive soils. Impacts would be less than significant. Mitigation measures would not be necessary.

Impact GE-5: The proposed project would not have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water. ***(No Impact)***

Implementation of the proposed project would not include facilities that would require the use of septic systems or alternative wastewater disposal systems. Therefore, no impact would occur.

Impact GE-6: The proposed project would not directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. ***(Less than Significant)***

The proposed project is in an area that was reclaimed by extensive filling; the site is characterized by artificial fill[91] over estuarine mud. The fill, consisting of sand, debris fill, and dredged Bay Mud, was placed on the site in the early 1960s. It extends to approximately 45 feet.[92] Underlying the fill are layers of Young Bay Mud, older sediments, and the Franciscan Formation. Drilled borings located the Franciscan Formation at approximately 290 feet below the ground surface.[93] Because the maximum depth of excavation for the proposed project would be 5 feet, project activities would occur entirely within the artificial fill that was moved to the site in the early 1960s. Therefore, the impact associated with the risk of directly or indirectly destroying a unique paleontological resource or unique geologic feature would be less than significant. Mitigation measures would not be necessary.

Impact C-GE-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative impacts on geology, soils, or paleontological resources. ***(Less than Significant)***

Development in the seismically active region can put people and structures at risk from a wide range of earthquake-related effects, including seismic ground shaking and seismically induced liquefaction. Potentially adverse environmental effects associated with these seismic hazards, as well as those associated

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91 Wagner, D.L., E.J. Burtugno, and R.D. McJunkin, *Geologic Map of the San Francisco-San José Quadrangle, California,* 1:250,000.1991, ftp://ftp.consrv.ca.gov/pub/dmg/pubs/rgm/RGM_005A/, accessed September 9, 2025.

92 Kleinfelder, *Geotechnical Report, Proposed Sand Processing Plant, Pier 92, San Francisco, California,* Project No. 25000566.001A, August 27, 2024.

93 Ibid.

with expansive soils and erosion, usually are site specific; they generally do not combine with cumulative projects. In addition, various mechanisms are in place to reduce risks at the project level, including required compliance with applicable ordinances and regulations, recommendations found in a site-specific geotechnical evaluation, as well as the seismic design standards promulgated by the CBC. Implementation of the provisions of the CBC, adherence to local ordinances and laws, and implementation of the recommendations found in the geotechnical report would ensure that potential site-specific geotechnical conditions would be addressed fully in the design of cumulative projects, ensuring that any potential cumulative impacts would be less than significant. Mitigation measures would not be necessary.

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Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
17. HYDROLOGY AND WATER QUALITY. Would the project:					
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality?	☐	☐	☒	☐	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	☒	☐	☐
c) Substantially alter the existing drainage pattern of the site or area, including through alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would:					
i) Result in substantial erosion or siltation onsite or offsite;	☐	☐	☒	☐	☐
ii) Substantially increase the rate or amount of surface runoff in a manner that would result in flooding onsite or offsite;	☐	☐	☒	☐	☐
iii) 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; or	☐	☐	☒	☐	☐
iv) Impede or redirect floodflows?	☐	☐	☐	☒	☐
d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	☒	☐	☐
e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact HY-1: The proposed project would not violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water or groundwater quality. *(Less than Significant)*

Construction

Construction of the project would involve ground-disturbing activities such as excavation and grading. Construction activities have the potential to generate runoff that contains sediments and other pollutants that may be mobilized into drainages structures or other water bodies, which could degrade water quality if not properly controlled. Sources of pollution associated with construction also include chemical substances from construction equipment or materials as well as hazardous or toxic materials, such as fuels, oils, grease, or lubricants. An accidental discharge of hazardous materials to surface waters during construction could also temporarily adversely affect water quality or result in a violation of water quality standards. However, because more than 1 acre of soil would be disturbed by the project, the project would be subject to the CGP. Erosion and stormwater control requirements are specified in the CGP. These requirements include preparation and implementation of a SWPPP that contains BMPs. The SWPPP would identify potential sources of sediment and other pollutants and prescribe BMPs to ensure that potential adverse erosion, siltation, and contamination impacts do not occur during construction activities. Implementation of a SWPPP and BMPs would control erosion and protect water quality from potential contaminants in stormwater runoff from the construction site. BMPs may include covers, drains, and storage precautions for outdoor material storage areas; temporary cover for disturbed surfaces; and earthen berms, silt fences, check dams, soil blankets or mats, covers for stockpiles, or other BMPs to trap sediments. Such BMPs would help to protect surface water and groundwater quality. The SWPPP would establish good housekeeping measures for construction vehicle storage and maintenance, handling procedures for hazardous materials, and waste management BMPs, which would include procedural and structural measures to prevent the release of wastes and materials used at the site. The SWPPP also would detail spill prevention and control measures to identify the proper storage and handling techniques of fuels and lubricants and the procedures to follow in the event of a spill. Potential impacts on water quality would be less than significant. Mitigation measures would not be necessary.

Operation

The project consists of reconstruction and modernization of the existing sand processing facility by installing new equipment, constructing a new warehouse, and paving and reconfiguring the site. Currently, approximately 10,000 square feet (5 percent) of the 190,230-square-foot project site is impervious cover. The proposed project is expected to be 224,600 square feet, with approximately 95,700 square feet of impervious cover due to new paving and the storage warehouse (43 percent). An increase in impervious area could result in increased runoff and associated pollutants. The current stormwater system includes settling basins that are connected to an existing authorized discharge pond (EFF-001) by an underground pipe. The pond discharges into the Bay and complies with NPDES General Permit requirements (Order No. R2-2020-0028, described below). A modern stormwater management system would be installed (draft EIR Figure 2-15, p. 2-23). The proposed drainage pattern would remain similar to the existing pattern and use drainage channels, valley gutters, and underground conveyance to direct flows to the discharge pond. The proposed project would install and operate a new sand processing system with new equipment, enhanced environmental controls, and other site upgrades. However, the essential nature of the existing operations at the facility

would not change. Rather, the proposed project would allow for the existing operation to continue on a redesigned site with modern equipment and improved environmental controls.

The project would comply with the waste discharge requirements (WDRs) for Discharges from Aggregate Mining, Marine Sand Washing, and Sand Offloading Facilities NPDES General Permit (Order No. R2-2020-0028). The general permit requires preparation and implementation of a BMP plan that describes steps to ensure that discharges would not adversely affect receiving waters. Stormwater would be managed in accordance with the BMP plan, as required by the general permit. In addition, operations and stormwater treatment onsite would comply with the 2013 NPDES Phase II Municipal Separate Storm Sewer System (MS4) Permit (as amended by Order WQ 2015-0133-EXEC, Order WQ 2016-0069-EXEC, Order WQ 2017- 0031-DWQ, Order WQ 2018-0001-EXEC, Order WQ 2018-0007-EXEC, and Order WQ 2019-0009-EXEC) and the Regional Water Quality Control Board discharge permit and testing requirements, as needed. The stormwater MS4 permit requires the use of best conventional pollutant control technology for the control of conventional pollutants and best available technology economically achievable for toxic and nonconventional pollutants. Compliance with these regulations would ensure that potential project impacts on water quality would be less than significant. Mitigation measures would not be necessary.

Impact HY-2: The proposed project would not substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the proposed project may impede sustainable groundwater management of the basin. ***(Less than Significant)***

Implementation of the project would increase the amount of impervious surface cover, as discussed in Impact HY-1. An increase in the impervious area would result in a decrease in groundwater recharge at the site. However, the remainder of the site would remain pervious.

Runoff would be directed to drainage channels, valley gutters, and underground conveyance to direct flows to the discharge pond. Remaining pervious cover on the project site could allow for groundwater infiltration and groundwater recharge. The maximum depth of excavation during construction activities would be 5 feet. Groundwater underlying the project site was encountered approximately 10 feet below the ground surface (Kleinfelder 2024). Groundwater dewatering during construction activities is not expected. No groundwater supplies would be used during construction or operations. Therefore, potential impacts on groundwater supplies and recharge would be less than significant. Mitigation measures would not be necessary.

Impact HY-3: The proposed project would not substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner that would result in substantial erosion, siltation, or flooding onsite or offsite and 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 or impede or redirect floodflows. ***(Less than Significant)***

During construction, existing drainage patterns could temporarily be altered through minor grading, potentially resulting in temporary erosion. BMPs would be implemented to manage runoff and potential erosion, as described in the SWPPP, in compliance with the CGP. Good housekeeping practices identified in the SWPPP would prevent runoff and contain associated sediment. Implementation of BMPs would minimize

excess soil disturbance and reduce associated soil erosion and siltation impacts. The impacts would be less than significant. Mitigation measures would not be necessary.

New impervious surface cover would be added as part of the project. However, the project site and associated drainage patterns would remain similar to the existing configuration. The existing site slopes from the southwest to the northwest. A modern stormwater management system would be installed (draft EIR Figure 2-15, p. 2-23). Existing settling basins connect to an existing approved discharge pond (EFF-001) through an underground pipe. The pond then discharges into the Bay. The proposed drainage patterns would remain the same as existing conditions but would utilize drainage channels, valley gutters, and underground conveyance to direct water to the discharge pond connected to EFF-001. The project would not 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. The impacts would be less than significant. Mitigation measures would not be necessary.

Project operations would comply with WDRs, including the NPDES General Permit (Order No. R2-2020-0028), which requires the implementation of a BMP plan. Implementation of the BMP plan would ensure that stormwater would be appropriately managed and that discharges would not adversely affect receiving waters. In addition, operations and stormwater treatment onsite would comply with the 2013 NPDES Phase II MS4 Permit. As a result, surface runoff impacts would be less than significant. Mitigation measures would not be necessary.

Construction equipment would be relocated to minimize flood risks, as needed. No new structures would be placed within a floodplain. The project would not impede or redirect floodflows. There would be no impact related to impeding or redirecting floodflows.

Impact HY-4: The proposed project would not risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. *(Less than Significant)*

The project site is predominantly outside of the 100-year floodplain, within Federal Emergency Management Agency (FEMA) Zone X.[94] FEMA Zone X is an area of minimal flood hazard. A portion of the project that extends toward the Islais Creek Channel is within the FEMA 100-year floodplain, within FEMA Zone AE and Zone VE. FEMA Zone AE is the 100-year floodplain where base flood elevations are provided; Zone VE applies to coastal areas. Although the potential for inundation due to a seiche is considered low, the project is within an area with the potential for inundation due to tsunami.

Project construction would involve use of motorized heavy equipment that requires the use and storage of fuel, lubricating grease, and other fluids and chemicals. Prior to a flood event, construction equipment and materials would be relocated as necessary so that pollutant releases due to project inundation would be reduced. Measures required by the CGP, including preparation of a SWPPP and associated stormwater BMPs, would limit site runoff during construction. BMPs would control construction site runoff, ensure proper stormwater control and treatment, and reduce the discharge of pollution to the storm drain system. In addition, measures such as sandbags and other temporary barriers would reduce the release of pollutants and manage floodflows.

[94] Federal Emergency Management Agency, *Flood Insurance Rate Map, City and County of San Francisco, California,* Panel 232 of 304, 2021.

If a flood event is anticipated with the potential to inundate the project site, operations would be paused. Floodflows and associated pollutants would be redirected around existing and proposed facilities located within the floodplain, similar to existing conditions. The project would be designed to avoid adverse effects related to flooding through appropriately designed drainage infrastructure. Improvements would be designed with appropriate drainage considerations to ensure adequate stormwater capacity and management of floodflow. The potential for release of pollutants due to inundation would be similar to existing conditions. In addition, construction and operation would comply with local stormwater and floodplain management ordinances, stormwater requirements of the MS4 permit, and WDRs. Potential impacts related to a release of pollutants due to inundation of the project site would be less than significant. Mitigation measures would not be necessary.

Impact HY-5: The proposed project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. ***(Less than Significant)***

Commonly practiced BMPs would be implemented to control construction site runoff and reduce the discharge of pollutants from stormwater and other nonpoint-source runoff. As part of compliance with permit requirements during ground-disturbing or construction activities, implementation of water quality control measures and BMPs would ensure that water quality standards would be achieved, including the water quality objectives that protect designated beneficial uses of surface and groundwater, as defined in the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan). Construction runoff would also have to comply with the appropriate water quality objectives for the region. The CGP also requires stormwater discharges not to contain pollutants that cause or contribute to an exceedance of any applicable water quality objectives or water quality standards, including designated beneficial uses. During operations, stormwater would be managed in accordance with the BMP plan, as required by the NPDES General Permit (Order No. R2-2020-0028). Implementation of the BMP plan would ensure that discharges would not adversely affect receiving waters. In addition, operations and stormwater treatment onsite would comply with the NPDES Phase II MS4 Permit and Regional Water Quality Control Board testing requirements, as needed.

No groundwater dewatering is anticipated during construction, and no groundwater supplies would be used during construction or operations. Although the amount of impervious cover would increase upon project completion, a modern stormwater management system would be installed (draft EIR Figure 2-15, p. 2-23). Runoff would be directed to drainage channels, valley gutters, and underground conveyance to direct flows to the discharge pond. Remaining pervious cover on the project site could allow for groundwater infiltration and groundwater recharge. Construction and operation of the project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. Construction- and operation-related impacts associated with the project would be less than significant. Mitigation measures would not be necessary.

Impact C-HY-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact on hydrology and water quality. ***(Less than Significant)***

Development of the project combined with other past and future development in the vicinity could result in adverse cumulative effects on hydrology and water quality. Impacts are related to increases in impervious areas and associated stormwater runoff and pollutant loading in storm drains that ultimately drain to San

Francisco Bay. However, most other reasonably foreseeable projects would be redevelopment or infill projects in highly urbanized areas where there is a substantial amount of existing impervious surfaces. All new development is required to handle stormwater so that flooding is not increased or redirected to other areas. All cumulative projects would be required to include post-construction stormwater management features, such as low-impact development (LID) measures to reduce flows to pre-project conditions. Projects are subject to the requirements of the San Francisco Bay MS4 Permit, the CGP, the stormwater management ordinance, and the construction site run-off ordinance to protect water resources and reduce impacts on hydrology and water quality. Therefore, no significant cumulative impact on hydrology and water quality would occur, and cumulative impacts would be less than significant. Mitigation measures would not be required.

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Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
18. HAZARDS AND HAZARDOUS MATERIALS. Would the project:					
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐	☐
c) Emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school?	☐	☐	☐	☒	☐
d) Be located on a site included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, create a significant hazard to the public or the environment?	☐	☐	☐	☒	☐
e) For a project within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	☐	☐	☒
f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐	☐
g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires?	☐	☐	☐	☐	☒

The project site is not in the vicinity of a private airstrip or an airport land use plan area or in an area within 2 miles of a public airport or public use airport. Therefore, Topic E.18.e is not applicable to the project and is not discussed further.

IMPACTS AND MITIGATION MEASURES

Impact HZ-1: The proposed project would not create a significant hazard through the routine transport, use, or disposal of hazardous materials. *(Less than Significant)*

Construction activities associated with the proposed project would involve routine transport, use, and disposal of hazardous materials such as solvents, paints, oils, and grease, materials that are typically used in construction projects. Such transport, use, and disposal would be in compliance with applicable regulations, such as those associated with the Resource Conservation and Recovery Act (RCRA), Occupational Safety and Health Administration (OSHA), the U.S. Department of Transportation, and others. These regulations cover hazardous materials–related topics such as proper personal protective equipment and the transport, handling, and disposal of hazardous materials, among others.

Although solvents, paints, oils, grease, fuel, and other materials would be transported, used, and disposed of during the construction of the proposed project, these materials are typically used in construction projects and would not represent the transport, use, and disposal of acutely hazardous materials. Moreover, these hazardous materials are generally used in small amounts, and any potential construction-related hazardous releases or emissions would be from commonly used materials, such as those previously mentioned, and would not include substances listed in 40 Code of Federal Regulations 355, Appendix A: Extremely Hazardous Substances and Their Threshold Planning Quantities. Releases involving common construction hazardous materials would be small and localized, and spills that may occur would be contained and cleaned up according to the safety data sheet (SDS) in the appropriate manner.[95] A hazardous material SDS include accidental release cleanup measures such as appropriate techniques for neutralization, decontamination, cleaning, or vacuuming and the types of adsorbent materials to use.

The existing Pier 92 facility has storage areas and shipping containers for hazardous materials, mainly used oil; an above-ground storage tank contains diesel fuel. As stated in Chapter 2, Project Description and Site Context, the existing operations at the facility would not change under the proposed project; thus, similar hazardous materials use is anticipated. Hazardous materials on the project site are considered common (mainly used oil) and would be used in quantities similar to quantities under existing conditions—and for similar processes. All hazardous materials use would follow relevant regulations (such as, but not limited to, sections 1110 through 1117 and 1150 through 1152 of article 21 and applicable sections within article 21A and article 22 of the San Francisco Health Code), as under existing conditions, including those required by the San Francisco Department of Public Health, Environmental Health Branch (as the local Certified Unified Program Agency)[96] and SDS instructions (if available) for the individual materials. Any spills involving these materials would not involve large quantities and would be localized and cleaned up as they occur. Impacts would be less than significant. Mitigation measures would not be necessary.

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[95] Occupational Safety and Health Administration, *Hazard Communication Standard: Safety Data Sheets,* 2012, https://www.osha.gov/sites/default/files/ publications/OSHA3514.pdf, accessed August 28, 2025.

[96] City and County of San Francisco, *Environmental Health*, 2025, https://www.sf.gov/departments--department-public-health--environmental-health, accessed August 28, 2025.

Impact HZ-2: The proposed project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. *(Less than Significant)*

The project site is located within the Maher zone and is therefore subject to the requirements of the San Francisco Health Code article 22A (also known as the Maher Ordinance).[97] The goal of the Maher Ordinance is to protect public health and safety by requiring appropriate handling, treatment, disposal and when necessary, remediation of contaminated soils that are encountered in the building construction process.

Projects that disturb 50 cubic yards or more of soil that are located on sites with potentially hazardous soil or groundwater are subject to this ordinance. The Maher Ordinance requires the project sponsor to retain the services of a qualified professional to prepare an environmental site assessment that meets the requirements of San Francisco Health Code section 22.A.6. A site assessment determines the potential for site contamination and the level of exposure risk as a result of a project. Based on that information, the project sponsor may be required to conduct soil and groundwater sampling and analysis; where such analysis reveals the presence of hazardous substances in excess of state or federal standards, the project sponsor is required to submit a site mitigation plan to the health department or other appropriate state or federal agency and remediate any site contamination in accordance with the approved site mitigation plan prior to issuance of a building permit. A Maher application for the proposed project was submitted to the health department on November 12, 2024.

An environmental database search was conducted by ICF in August 2025 using the State Water Resources Control Board's (SWRCB's) GeoTracker,[98] the Department of Toxic Substances Control's (DTSC's) EnviroStor,[99] and the California Environmental Protection Agency's (CalEPA's) Cortese List Data Resources online databases. No listings were identified in any of the aforementioned databases within the proposed project footprint. In addition, the search did not identify any *active* listings of sites that would be categorized as Cortese sites[100] within a 0.5-mile radius (there were several SWRCB leaking underground storage tank [LUST] cleanup sites [which fit the criteria of Cortese sites] within the specified radius; however, all were listed with a *Case Closed* status and have presumably been remediated to the satisfaction of the applicable oversight agencies).

Conversely, other *active* types of hazardous material sites (with a history of environmental releases) were identified within a 0.5-mile radius of the proposed project footprint. Sites within this radius were analyzed because they are the most likely to have a deleterious effect on the project site. These hazardous materials sites identified within 0.5-mile radius of the project were identified as SWRCB cleanup program sites and DTSC cleanup sites (but did not meet the Cortese List criteria). The sites identified are discussed in more detail below.

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97 San Francisco Planning Department, *Plan Check Letter, Pier 92 Sand Terminal Modernization Project,* September 9, 2024.

98 State Water Resources Control Board, *GeoTracker,* 2025, https://geotracker.waterboards.ca.gov/, accessed August 28, 2025.

99 Department of Toxic Substances Control, *EnviroStor,* 2025, https://www.envirostor.dtsc.ca.gov/public/, accessed: August 28, 2025.

100 The data resources that provide information regarding the facilities or sites identified as meeting the "Cortese List" requirements include:

- List of Hazardous Waste and Substances sites from Department of Toxic Substances Control (DTSC) EnviroStor database,
- List of Leaking Underground Storage Tank Sites from the State Water Board's GeoTracker database,
- List of solid waste disposal sites identified by Water Board with waste constituents above hazardous waste levels outside the waste management unit.
- List of Cease and Desist Orders (CDO) and Cleanup and Abatement Orders (CAO) from Water Board.
- List of hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code, identified by DTSC.

Two active cleanup program sites were identified within the 0.5-mile radius of the project. One was listed as the Muni Metro East (MME) expansion project site at 601 25th Street. The site was listed with petroleum and polynuclear aromatic hydrocarbons affecting soil and groundwater; however, the site is across Islais Creek Channel, which acts as a natural buffer, and is highly unlikely to affect the project site. The second cleanup site is the former Pier 90 General Petroleum facility at Cargo Way (the northeast corner of Amador and Illinois streets); the site is listed with metals, diesel, gasoline, petroleum hydrocarbons, and waste oil, which affected soil, soil vapor, and groundwater. However, according to an April 2025 Offsite Soil and Groundwater Assessment Report,[101] groundwater flow at the site is variable; its primary flow is to the north-northwest, toward Islais Creek Channel and away from the proposed project footprint. As such, potential impacts on the proposed project footprint as a result of historical contamination at these sites is considered low.

One active DTSC cleanup site was identified (with a history of environmental releases) within the 0.5-mile radius of the project. It is listed as the SF Energy Company Cogeneration Project site at Seawall Lot 344. The site is listed with total petroleum hydrocarbons (TPH), polycyclic aromatic hydrocarbon (PNA), and polychlorinated biphenyl (PCB) impacts on soil. The case was opened in 1995; very little additional information was found in the EnviroStor database. However, because contaminants in soil do not typically migrate offsite, potential impacts on the proposed project site associated with the SF Energy Company Cogeneration Project site are considered low. Therefore, impacts associated with a significant hazard to the public or the environment involving reasonably foreseeable upset conditions or the disturbance of existing hazardous material during construction of the project would be less than significant. Mitigation measures would not be necessary.

Impact HZ-3: The proposed project would not emit hazardous emissions or involve handling hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. ***(No Impact)***

There are no schools within 0.25 mile of the proposed project. The closest school is the Malcolm X Academy at 200–398 Harbor Road, approximately 0.75 mile away. No impact would occur.

Impact HZ-4: The proposed project would not be located on a site included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, create a significant hazard to the public or the environment. ***(No Impact)***

As mentioned under Impact HZ-2, an environmental database search was conducted by ICF in August 2025 using GeoTracker (SWRCB 2025),[102] EnviroStor (DTSC 2025),[103] and the Cortese List Data Resources.[104] The search did not identify any environmental database listings within the project site footprint, including those

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[101] Stantec, *Offsite Soil and Groundwater Assessment Report, Former Mobil Bulk Facility, Port of San Francisco, Amador and Illinois Streets, San Francisco, California,* SMED Case Number 0860, 2025, https://documents.geotracker.waterboards.ca.gov/esi/uploads/geo_report/1509567141/T10000018603.PDF, accessed August 28, 2025.

[102] State Water Resources Control Board, *GeoTracker,* 2025, https://geotracker.waterboards.ca.gov/, accessed August 28, 2025.

[103] Department of Toxic Substances Control, *EnviroStor,* 2025, https://www.envirostor.dtsc.ca.gov/public/, accessed: August 28, 2025.

[104] California Environmental Protection Agency, *Cortese List Data Resources*, 2025, https://calepa.ca.gov/sitecleanup/corteselist/, accessed August 28, 2025.

that would be categorized as Cortese sites. Thus, implementation of the project would not create a significant hazard to the public or the environment as a result of being located on a Cortese List site. No impact would occur.

Impact HZ-6: The proposed project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. *(Less than Significant)*

Project development would not include any permanent changes to existing public roadways that provide emergency access to the project site or surrounding area. The project consists of the reconstruction and modernization of the existing sand processing facility on Pier 92, including the installation and operation of a new sand processing system with new equipment, enhanced environmental controls, and other upgrades. It is possible that construction activity associated with the project could affect emergency response or evacuation plans due to temporary construction barricades or other roadway obstructions that could impede emergency access onsite. However, compliance with city requirements regarding emergency access during construction activities would minimize potential impacts associated with emergency response times and access; therefore, emergency response access or emergency evacuation plan routes would not be impeded significantly during the construction period. Furthermore, as discussed under Impact TR-1 of Section E.6, Transportation, project traffic would not cause a substantial adverse effect on emergency access or response. Also, the project would not involve any permanent features that would impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan in the project area. Impacts would be less than significant. Mitigation measures would not be necessary.

Impact HZ-7: The proposed project would not expose people or structures, either directly or indirectly, to a significant risk of loss, injury, or death involving wildland fires. *(No Impact)*

The project site is in a mostly developed area of San Francisco with no fire-prone wildlands intermixed. Land uses surrounding the project site are mostly industrial, with the exception of the Pier 94 wetlands, which border the site on the east and southeast. According to the California Department of Forestry and Fire Protection's (CAL FIRE's) Fire Hazard Severity Zones in State Responsibility Area map (found using the Fire Hazard Severity Zone Viewer), the project site is not within a Very High, High, or Moderate Fire Hazard Severity Zone.[105] The project would not create or exacerbate wildfire risks of any nature; thus, it is not susceptible to significant risk of loss, injury, or death involving wildland fires. No impact would occur.

Impact C-HZ-1: The proposed project, in combination with cumulative projects, would not result in a significant cumulative impact related to hazards and hazardous materials. *(Less than Significant)*

The geographic context for cumulative hazards and hazardous materials consists of sites within the project area and nearby properties in the immediate vicinity. In general, only projects occurring in the immediate vicinity of the project are considered due to the limited potential impact area associated with the release of hazardous materials into the environment. Reasonably foreseeable projects in the proposed project's surroundings could result in construction impacts related to the routine transport, disposal, or handling of

[105] California Department of Forestry and Fire Protection, *Fire Hazard Severity Zones in State Responsibility Area*, 2024.

hazardous materials; intermittent use and transport of petroleum-based lubricants, solvents, and fuels; and transport of affected soil to and from sites. However, hazardous waste generated during construction of any project would be collected, properly characterized for disposal, and transported in compliance with regulations. In addition, affected sites under development would undergo remediation under the oversight of applicable State and local agencies, effectively reducing the contaminants found in the cumulative project area.

Hazardous materials are strictly regulated by local, State, and federal laws. Specifically, these laws are designed to ensure that hazardous materials do not result in a gradual increase of toxins in the environment. For each of the reasonably foreseeable projects under consideration, various project-specific measures would be implemented as a condition of development approval to mitigate risks associated with exposure to hazardous materials. For these reasons, the proposed project, in combination with other past, present, and reasonably foreseeable future projects, would not result in significant cumulative hazards or a hazardous materials impact. The proposed project's contribution to cumulative impacts would therefore not be significant. Mitigation measures would not be necessary.

———————————————

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
19. MINERAL RESOURCES. Would the project:					
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	☐	☐	☐	☐	☒

Pursuant to the Surface Mining and Reclamation Act of 1975, the California Division of Mines and Geology has designated all land in San Francisco, including the project site, within the Waterfront Plan area, as Mineral Resource Zone 4.[106] This designation indicates that inadequate information is available to assign the site to any other mineral resource zone; thus, the project site is not a designated area of significant mineral deposits. No sites in San Francisco, including the project site, are designated areas of significant mineral deposits. Therefore, topics E.19(a) and 19(b) are not applicable to the project.

———————————————

[106] California Department of Conservation, Division of Mines and Geology, *Update on Mineral Land Classification: Aggregate Materials in the South San Francisco Bay Production-Consumption Region,* DMG Open-File Report 96-03, 1996.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
20. ENERGY. Would the project:					
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources during project construction or operation?	☐	☐	☒	☐	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	☒	☐	☐

IMPACTS AND MITIGATION MEASURES

Impact EN-1: The proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources during construction or operation. *(Less than Significant)*

The project site is currently occupied by an approximately 190,230-square-foot facility used for marine sand offloading and processing. PG&E serves the project site from right-of-way lines and connections. As detailed in Chapter 2, Project Description and Site Context, electricity consumption is dependent on the volume of sand processed. No natural gas is consumed under existing or proposed project operations.

Project construction activities would require the use of trucks and other equipment that would consume energy. Construction activities are expected to require truck trips related to demolition, excavation, and the import of other construction materials. In addition to haul trucks, project construction would require the use of diesel-powered equipment, including a man lift, crane, forklift, paver, water truck, Bobcat, sheepsfoot compactor, vibratory drum roller, and motor grader. Construction energy consumption would cease once construction of the proposed project is complete, after approximately seven months; therefore, it is considered short term. Construction of the proposed project would not result in wasteful, inefficient, or unnecessary consumption of energy resources. The impact would be less than significant.

The proposed project would consume energy to support normal day-to-day operations associated with the sand processing facility. Trucks and other vehicles traveling to and from the project site would require energy in the form of gasoline, diesel, and/or electricity. The specific fuel required would depend on the mode of transportation and type of engine used to propel the vehicle. The additional truck trips and increased off-road equipment use associated with the increase in sand throughput would result in an increase in fuels and/or electricity compared to baseline conditions. This increase would not be considered wasteful, inefficient, or unnecessary as it is directly related to the increase in sand processing proposed by the project. Project operational activities would be substantially similar to existing operational activities, resulting in a similar electricity demand per volume of sand. Replacement of older stationary equipment with modern models may in fact result in an increase in energy efficiency. Approximately 0.62 kWh of electricity per ton of sand processed would be required under operation of the proposed project. Similar to existing operations, no natural gas would be consumed under project operations. Furthermore, as described in Chapter 2, Project Description, no utility upgrades would be anticipated to serve operations of the proposed project. As such, operation of the proposed project would not significantly increase energy demand within the service territory and would not require new energy facilities. Therefore, the proposed project would result in a less-

than-significant impact with respect to the wasteful, inefficient, or unnecessary consumption of energy resources. Mitigation measures would not be necessary.

Impact EN-2: The proposed project would not conflict with or obstruct a state or local plan for renewable energy or energy efficiency. *(Less than Significant)*

California's renewable energy and energy efficiency plans include the Renewables Portfolio Standard (RPS) Program and the California Energy Efficiency Strategic Plan. The RPS Program requires utility providers to provide 60 percent of their electricity from renewable sources by 2030 as well as all of the state's electricity to come from carbon-free sources by 2045. At a local level, the RPS Program is implemented through providers' Integrated Resource Plans (IRPs), which provide guidance for serving the electricity and natural gas needs of residents and businesses within a service area while fulfilling regulatory requirements. PG&E adopted their most recent IRP in November 2022.[107] The California Energy Efficiency Strategic Plan provides a long-term plan to increase energy efficiency in California.

At a local level, the majority of San Francisco's energy-efficiency requirements are geared toward commercial and residential development and thus do not apply to the proposed project. Because the proposed project would consist of the reconstruction and modernization of the existing sand processing facility and the nature of the existing operations at the facility would not change under the proposed project, the proposed project would not introduce any new uses that would conflict with or obstruct a state or local plan for renewable energy or energy efficiency, such as PG&E's IRP or the California Energy Efficiency Strategic Plan. Therefore, this impact would be less than significant. Mitigation measures would not be necessary.

Impact C-EN-1: The proposed project, in combination with cumulative projects, would not result in significant cumulative impacts related to the wasteful, inefficient, or unnecessary consumption of energy resources or conflict with or obstruct a state or local plan for renewable energy or energy efficiency. *(Less than Significant)*

The geographic context for cumulative energy resources is the service area of PG&E, which comprises the larger Northern California area and the city. Continued growth throughout the PG&E service area could contribute to ongoing increases in demand for electricity and natural gas. These anticipated increases would be countered, in part, by ongoing increases in state and local requirements related to renewable energy and energy efficiency. However, the extent to which cumulative development could result in the wasteful, inefficient, or unnecessary consumption of energy resources would depend on the specific characteristics of new development, which are not known at this time.

PG&E reached California's 2020 renewable energy goal three years ahead of schedule and is currently projected to meet the Senate Bill 100 goal, which calls for 100 percent clean energy by 2045. Therefore, it is anticipated that future energy use as a result of development will become more efficient and less wasteful over time. In addition, cumulative development would be required to comply with all adopted state and local renewable energy and energy efficiency regulations and plans. Thus, the proposed project in

[107] Pacific Gas and Electric Company, *Integrated Resource Plan*, 2022, https://www.pge.com/assets/pge/docs/about/doing-business-with-pge/2022-PGE-Integrated-Resource-Plan.pdf, accessed September 8, 2025.

combination with cumulative projects would result in a less-than-significant cumulative impact on energy resources. Mitigation measures would not be necessary.

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Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
21. AGRICULTURE AND FORESTRY RESOURCES. In determining whether impacts on agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts on forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment project, and the forest carbon measurement methodology provided in forest protocols adopted by the California Air Resources Board. Would the project:					
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use or a Williamson Act contract?	☐	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forestland (as defined in PRC section 12220(g)), timberland (as defined by PRC section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☐	☒
d) Result in the loss of forestland or conversion of forestland to non-forest use?	☐	☐	☐	☐	☒
e) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of farmland to non-agricultural use or forest land to non-forest use?	☐	☐	☐	☐	☒

The project site does not contain any prime farmland, unique farmland, farmland of statewide importance, forestland, or timberlands; does not support agricultural or timber uses; is not zoned for agricultural or timber uses; and is not under a Williamson Act contract.[108,109] Because the project site does not contain agricultural uses or forestland and is not zoned for such uses, the project would not result in the conversion

[108] California Department of Conservation, *California Important Farmland Finder*, https://maps.conservation.ca.gov/DLRP/CIFF/, accessed August 13, 2025.

[109] The Williamson Act is a California law enacted in 1965 that provides property tax relief to owners of farmland and open space land in exchange for a 10-year agreement that the land will not be developed or converted into another use. The City and County of San Francisco does not offer Williamson Act contracts.

of farmland to non-agricultural use or forestland to non-forest use. Therefore, the agriculture and forest resources significance criteria are not applicable to the proposed project. These topics are not discussed further.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
22. WILDFIRE. If located in or near State Responsibility Areas or lands classified as Very High Fire Hazard Severity Zones, would the project:					
a) Substantially impair an adopted emergency response plan or emergency evacuation plans?	☐	☐	☐	☐	☒
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	☐	☐	☒
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines, or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts on the environment?	☐	☐	☐	☐	☒
d) Expose people or structure to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	☐	☒

San Francisco County does not contain any State Responsibility Area land or lands classified as Very High Fire Severity Zones.[110] There are no landslide-prone areas in the immediate vicinity of the project site.[111]

Therefore, none of the wildfire significance criteria are applicable to the proposed project, and these topics are not discussed further.

[110] California Department of Forestry and Fire Protection, *San Francisco County Fire Hazard Severity Zone (FHSZ) Map*, November 2008, https://osfm.fire.ca.gov/media/6791/fhszl06_1_map38.pdf, accessed February 2, 2021.

[111] City and County of San Francisco, *Community Safety, an Element of the General Plan of the City and County of San Francisco*, Map 04, October 2012.

Topics:	Potentially Significant Impact	Less than Significant with Mitigation Incorporated	Less than Significant Impact	No Impact	Not Applicable
23. MANDATORY FINDINGS OF SIGNIFICANCE. Does the project:					
a) Have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐	☐
b) Have impacts that are individually limited but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)	☐	☒	☐	☐	☐
c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒	☐

NOTE: Authority cited: Public Resources Code sections 21083 and 21083.05, 21083.09. Reference: Section 65088.4, Gov. Code; Public Resources Code sections 21073, 21074, 21080(c), 21080.1, 21080.3, 21083, 21083.05, 21083.3, 21080.3.1, 21080.3.2,21082.3, 21084.2, 21084.3, 21093, 21094, 21095, and 21151; *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296; *Leonoff v. Monterey Board of Supervisors* (1990) 222 Cal.App.3d 1337; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.

a. As discussed in this initial study, the proposed project is anticipated to have less-than-significant impacts on most of the environmental topics discussed. Specifically, initial study Section E.15, Biological Resources, discusses the potential for the project to substantially affect habitats, fish/wildlife populations, and sensitive natural communities. All impacts related to biological resources would be less than significant. Initial study Section E.4, Cultural Resources; Section E.5, Tribal Cultural Resources; and Section E.16, Geology and Soils, discuss the potential for the proposed project to affect important examples of California prehistory. All impacts on archeological resources, TCRs, and paleontological resources would be less than significant or less than significant with mitigation.

b. The proposed project, in combination with cumulative projects, as described in initial study Section E, would not result in significant cumulative impacts on land use and planning, aesthetics, population and housing, cultural resources, TCRs, transportation and circulation, noise, GHG emissions, wind, shadow, recreation, utilities and service systems, public services, biological resources, geology and soils, hydrology and water quality, hazards and hazardous materials, mineral resources, energy resources, agriculture and forestry resources, and wildfire with implementation of identified mitigation, if required. Consequently, the proposed project would not have impacts that would be individually limited but

cumulatively considerable. Potential cumulative impacts related to air quality are analyzed in draft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.

c. Potential adverse effects on human beings have been considered as a part of the analysis of individual environmental topics in this initial study. As discussed above, the proposed project would not cause substantial adverse effects on human beings, either directly or indirectly. Potential air quality effects that could adversely affect human beings are discussed indraft EIR Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.

_____

F. Public Notice and Comment

On July 2, 2025, the planning department mailed a notice of preparation of an EIR and notice of a public scoping meeting to owners of properties within 1,000 feet of the project site, adjacent occupants, and neighborhood groups. The planning department sent email notifications to neighborhood groups and individuals that requested project notifications from the planning department. The planning department posted these notices on the planning department's environmental review webpage and filed the NOA with the San Francisco County Clerk's office. The planning department submitted the notice of preparation to the State Clearinghouse on July 2, 2025. Due to technical issues, the receiving date was listed as July 14, resulting in a comment period for State agencies of July 14, 2025, to August 12, 2025. The planning department also published a newspaper advertisement in the *San Francisco Examiner* on July 2, 2025, announcing the opportunity for public comment on the project. A public scoping meeting was held on July 16, 2025, at the Southeast Community Center. Written comments regarding the scope of the EIR were accepted for a standard 30-day period, from July 2, 2025, to August 1, 2025. A total of nine comment letters and emails were submitted to the planning department.

Overall, concerns and issues raised by the public in response to the notice were taken into consideration and incorporated in the environmental review as appropriate.

The planning department received comments expressing concerns about:

- Environmental impacts related to warehouse projects and the Attorney General Office's Bureau of Environmental Justice document with best practices and mitigation measures for warehouse projects as well as land use conflicts and air quality impacts on sensitive receptors (California Department of Justice);
- Interest in the project's VMT analysis, impacts on State right-of-way related to temporary access points, mitigation related to construction and noise, application of a transportation permit related to the movement of oversize or excessive-load vehicles on State roadways, and coordination for development of a transportation management plan to reduce construction traffic impacts on the State transportation network (Caltrans);
- Coordination with the California Department of Fish and Wildlife (CDFW) (i.e., CDFW as a trustee agency is charged with providing biological expertise during environmental review; CDFW would be a responsible agency if the project is subject to its lake and streambed alteration regulatory authority or should the project result in "take," as defined by the California Endangered Species Act); the habitat descriptions and species profiles, as well as related source materials, to assess which special-status species are likely to occur in the project vicinity; the scope of direct impacts considered under CEQA; cumulative impacts; discussion of take avoidance and minimization measures for special-status species;

documentation of site surveys to California Natural Diversity Database; and notation of anticipated filing fee requirements (California Department of Fish and Wildlife; CDFW);

- Analysis of noise impacts related to operation, especially as it relates to impacts on birds and other wildlife in the Pier 94 wetland; potential impacts of increased traffic in Islais Creek (related to movement of materials); and effects of light impacts from additional lighting planned for the project area (Golden Gate Bird Alliance);
- Compliance with AB 53 and Senate Bill 18 as well as other applicable laws (Native American Heritage Commission);
- Anticipated water demand during construction and operation of the project, including whether the project would use recycled water or other non-potable sources of water for dust control, vehicle and equipment washing, and operational and maintenance needs (SFPUC).

Impacts related to land use compatibility are discussed in Section E.1, Land Use and Planning. Impacts related to air quality emissions and sensitive receptors are discussed in draft EIR Section 3.C, Air Quality. Impacts related to VMT and project construction are discussed in Section E.6, Transportation and Circulation. Impacts related to special-status species, project operation, related lighting, and take are discussed in Section E.15, Biological Resources. Impacts related to tribal consultation are discussed in Section E.5, Tribal Cultural Resources. Impacts related to water demand are discussed in Section E.13, Utilities and Service Systems. Project cumulative impacts are addressed under each resource topic.

G. Determination

On the basis of this initial study:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☐ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☒ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (1) has been adequately analyzed in an earlier document pursuant to applicable legal standards and (2) has been addressed by mitigation measures, based on the earlier analysis, as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, no further environmental documentation is required.



Lisa Gibson
Environmental Review Officer

May 20, 2026
Date

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APPENDIX C
HISTORIC RESOURCE EVALUATION

DRAFT

Historic Resource Evaluation for the Pier 92 Modernization and Plant Replacement Project

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July 2025

ICF. 2025. *Historic Resource Evaluation For The Pier 92 Modernization And Plant Replacement Project*. Draft. July. (ICF 105407.0.001.) San Francisco, CA. Prepared for San Francisco Planning, San Francisco, CA.

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ACRONYMS AND ABBREVIATIONS

Air District	Bay Area Air District
APN	Assessor's Parcel Number
ASTM	American Society for Testing and Materials
California Register	California Register of Historical Resources
CCR	California Code of Regulations
city	City and County of San Francisco
department	San Francisco Planning Department
HRE	Historic Resource Evaluation
National Register	National Register of Historic Places
NETR	Nationwide Environmental Title Research
Port	Port of San Francisco
project	Pier 92 Modernization and Plant Replacement Project
project site	Pier 92
USGS	U.S. Geological Survey

Historic Resource Evaluation

Pier 92 Modernization and Plant Replacement Project
Planning Department Case No. 2024-005922ENV

PART 1: SIGNIFICANCE EVALUATION

1. INTRODUCTION

ICF was retained by Martin Marietta Materials, Inc. to prepare this Historic Resource Evaluation (HRE) for the Pier 92 Modernization and Plant Replacement Project (project). The project proposes the installation and operation of a new, modern sand processing plant with enhanced environmental controls and site upgrades. The project will be implemented pursuant to an updated lease with the Port of San Francisco (Port) and operated pursuant to permits from the Bay Area Air District (Air District) (San Francisco Planning Department 2025).

Pier 92 (the project site) is part of a larger parcel with a diverse history of reclamation and development. The project site is leased by the Port to Martin Marietta Materials. Under the direction of the San Francisco Planning Department (department), ICF's HRE focused on the evaluation of built environment historical resources on the project site of the proposed project, not the entire parcel that contains the project site.

a. Location: Address, Cross Streets, and Neighborhood

   The Pier 92 sand processing facility is located at 480 Amador Street in San Francisco, California (see Appendix A). The Pier 92 site is within the Port's Maritime Eco-Industrial Center, which spans Piers 80 through 96 in the Southern Waterfront area of San Francisco. It is generally bounded by 25th Street on the north, Illinois Street on the west, and Cargo Way on the south in the Bayview neighborhood of San Francisco.

b. Assessor's Parcel Number(s) and Lot Size

   Assessor's Parcel Number (APN): 4502A002. Parcel Block, 4502A, Lot 002.[1] The entire parcel covers approximately 7,763,263 square feet. The current area leased by Martin Marietta Materials is approximately 190,229 square feet of the parcel's total square footage. The project site will include additional square footage to be leased by Martin Marietta Materials, and will be approximately 224,600 square feet (see Appendix B, Appendix C, and Appendix D).[2,3] Numerous properties with buildings and structures exist on one parcel; these are individually leased by the Port, except for Fire Station No. 25 at 3305 3rd Street, which sits within the Port-owned parcel but is owned and administered by the San Francisco Fire Department (**Figure 1**, p. 3).[4]

c. Zoning District

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1 San Francisco Planning Department, *San Francisco Property Information Map*, 2025, *https://sfplanninggis.org/pim/*, accessed March 27, 2025.

2 ParcelQuest, *4502A-002,* 2025, *https://pqweb.parcelquest.com/#home*, accessed March 27, 2025.

3 Martin Marietta Materials, Pier 92, Covered Storage with Gantry Site Plan, June 2024.

4 San Francisco Planning Department, *San Francisco Property Information Map*, 2025, *https://sfplanninggis.org/pim/*, accessed March 27, 2025.

M-2: Heavy Industrial.[5] M-2 Districts (heavy industrial) are suitable for larger industries served by rail and water transportation facilities and large utility lines. M-2 District uses are less restricted than M-1 Districts (light industrial) and are typically located at the eastern edge of the city, where they are separated from residential and commercial areas. The Port controls most of the land that has been zoned M-2. Section 260(b)(2)(M) of the San Francisco Planning Code (Code) exempts from the height requirement all structures and equipment necessary for the operation of industrial plants, and where structures and equipment do not contain separate floors, where permitted as principal or conditional uses by the Code.

d. Current Historic Status

The entire parcel is classified as "Category B – Unknown/Age Eligible" on the San Francisco Property Information Map.[6] It has not been included in any previous survey. The parcel as a whole has not been formally evaluated for individual listing in the California Register of Historical Resources (California Register), the National Register of Historic Places (National Register), or as a San Francisco Landmark under Article 10 of the Code. Moreover, the parcel, composed of multiple components, has not been evaluated as a historic district eligible at the local, state, or national level.

The project site has not been previously evaluated. However, several features on the larger parcel and in the surrounding area have been individually evaluated by consultants in coordination with the department.

Fire House No. 25 is a John Reid, Jr.–designed City and County of San Francisco (city) fire station on the south side of Islais Creek near the intersection of 3rd Street and Cargo Way. First evaluated by Carey & Co. in 1994, the building was determined to be eligible for National Register listing and local listing. Fire House No. 25 is listed in the California Register and as a historical resource for the purposes of the California Environmental Quality Act.[7]

In 2018, the department's preservation staff agreed with the findings of the Supplemental Information for Historic Resource Determination prepared by David Beaupre (dated June 2018) and determined that Pier 96 is not eligible for listing in the California Register individually, as a stand-alone historic district, or as a district contributor.[8]

Similarly, in 2021, the department's preservation staff agreed with the findings of an HRE (Part I) prepared by Architectural Resources Group (dated January 2018) and determined that Pier 90 is not eligible for listing in the California Register individually, as a stand-alone historic district, or as a district contributor.[9]

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5 Ibid.

6 Ibid.

7 Architecture + History, LLC, *Port of San Francisco Historic Resources Summary Report Analysis for the Waterfront Plan DEIR*, December 2021.

8 San Francisco Planning Department, *Preservation Team Review Form, San Francisco, CA*, 2018.

9 San Francisco Planning Department, *Part I, Historic Resource Evaluation Response, 2019-023037ENV, San Francisco, CA*, prepared for the Port of San Francisco 2019 Draft Waterfront Plan – Pier 90, March 2018.



Source: Google Earth Pro, edited by ICF 2025.

Figure 1. APN 4502A002 (Parcel Block, 4502A, Lot 002) Features and Project Site

2. BUILDING AND PROPERTY DESCRIPTION/SITE HISTORY

a. Exterior Architectural Description

The project site contains a sand processing plant with no permanent buildings. The site comprises multiple raw material stockpiles and sprayers, conveyor belts, storage structures, and mechanical equipment associated with sand processing; temporary ancillary buildings provide space for vehicle fueling and work assistance (i.e., bathrooms), life safety equipment storage, and meetings. The sand equipment is electrically powered, and the water used for the sand cleaning process is from the city.

Facility and Operations

The 190,229-square-foot Pier 92 facility has been used for marine sand off-loading and processing since at least 1982. The sand off-loaded at Pier 92 is used in a variety of applications on many different projects throughout the city and the Bay Area. Sand is a crucial component of concrete and asphalt and is essential for development, infrastructure, and restoration projects, including beach and shoreline restoration projects. Five employees currently work at the facility. The essential operations of the facility are as follows:

Step 1. Marine sand is delivered to the Pier 92 facility by barge from Islais Creek Channel along the northern boundary of the project site (see Appendix B). The sand is off-loaded by a conveyor running from the barge to the shore and saturated with water upon arrival and during unloading. The unloading conveyor moves the sand to the south and onto the site where it is then stored in a raw

material stockpile using a radial stacker and kept wet with sprinklers (**Figure 2**, p. 5, and **Figure 3**, p. 5). Unwashed sand for sale is transferred by loader to customers' trucks for delivery offsite.

Step 2. Raw material is moved from the raw material stockpile to the wash plant by a front-end loader. The wash plant is located near the southeast corner of the stockpile. The loader scoops sand from the stockpile and places it in the wash plant. The wash plant consists of a specifically designed conveyor with processing screens. Water is sprayed to wash the sand (**Figure 4**, p. 6).

Step 3. Raw material is screened and washed at the wash plant: The wash plant consists of a feed hopper and a specifically designed conveyor with sand washing equipment that submerses the sand in water. The sand is fed into the plant by a front-end loader at the feed hopper and is conveyed by conveyor belt onto a sand wash screen. The sand wash screen sprays water onto the sand to saturate it, while it passes over a quarter-inch mesh screen to remove the pea gravel and shell oversize material. The oversize material is conveyed by conveyor belt to a separate stockpile (**Figure 5**, p. 6). The sand that passes through the screen enters a large tub of water and a twin auger screw conveys the sand onto a dewatering screen that shakes the water off the sand. The sand exits the dewatering screen at a moisture content of approximately 10 percent and is conveyed to a loadout stockpile via a stacker. The conveyors and processing screen are not enclosed (**Figure 6**, p. 7). The maximum height of the tallest existing equipment is approximately 40 feet above grade. All stockpiles are uncovered; the conveyors, processing screen, and stockpiles are not required to be covered, in accordance with Air District regulations. All non-mobile equipment is electrically powered by a connection to the electrical grid. The sand washing process is used to produce an American Society for Testing and Materials (ASTM) standard concrete sand, by washing the sand in fresh water to lower the saltwater content in the sand and screen off oversize pea gravel and shells.

Step 4. Product sand is transferred to the product stockpile: The washed sand (product sand) is transferred to the product stockpile using a conveyor and radial stackers, which are not required to be covered per Air District regulations.

Step 5. Product sand is transferred to customer trucks: Customers' trucks enter the facility from Amador Street near Central Concrete Supply on the northwest side of the site. Martin Marietta does not own or operate any haul trucks. The site is not currently paved. Sand from the product stockpile is transferred by loader to customers' trucks for delivery offsite (**Figure 7**, p. 7). Customers transport the sand or contract for delivery of the material to end users and construction sites throughout the city and San Mateo County. As trucks depart, they pass through environmental controls to reduce track-out and emissions. The controls include a wheel wash system and track-out control mat. Trucks return to Amador Street near the southwest corner of the property. This area also includes two office trailers and employee parking (**Figure 8**, p. 8).

Martin Marietta estimates that approximately 65 percent of the sand offloaded at Pier 92 is transported by truck to the two adjacent ready-mix concrete facilities located on Pier 92.



Source: ICF 2025.

Figure 2. Off-loading Conveyor Belt from Islais Creek Channel to a Raw Material Pile



Source: ICF 2025.

Figure 3. Conveyor belt, Water Tank, and Temporary Shipping Container



Source: ICF 2025.

Figure 4. Conveyor Belt and Associated Machinery around the Piles during the Cleaning Process



Source: ICF 2025.

Figure 5. Conveyor Belt Filtering out Excess Material during the Cleaning Process



Source: ICF 2025.

Figure 6. Overview of the Project Site and Machinery Associated with the Sand Processing Plant



Source: ICF 2025.

Figure 7. The Fueling Station, with a Fuel Tank and Temporary Shipping Container, to Provide Diesel to the Loaders



Source: ICF 2025.

Figure 8. Prefabricated, Portable Buildings for Bathrooms, Life Safety Equipment Storage, and Meeting Space

b. Interior Architectural Description

The project site contains multiple raw material stockpiles and sprayers, conveyor belts, storage structures, various pieces of mechanical equipment associated with sand processing, and prefabricated, portable buildings, which were added to the facility after 2000. Due to their age and temporary nature, the portable buildings' interiors are not pertinent to their evaluation of historical and architectural significance.

c. Site History

Much of the seawall that forms the eastern edge of San Francisco is the result of various reclamation projects, which were intended to create a uniform waterfront along the east side of the city. The area that encompasses Piers 90 to 96, as well as the project site, was part of an infill project along the south bank of Islais Creek in the Bayview neighborhood during the late 1910s and early 1920s.

After the 1906 San Francisco earthquake and fire, Islais Creek was partially filled with debris. The creek and surrounding marshes were viewed as a barrier to further development within the southern portion of San Francisco. Until the mid-1910s, efforts for reclamation were unsuccessful. In 1915, the State of California passed legislation to enable the creation of the Islais Creek Reclamation District. The creation of this district led to marsh and tideland infill projects, including the dredging of Islais Creek and the creation of a 2,000-foot-long rock seawall to form the Islais

Creek Channel.[10] The State of California proposed the Islais Creek Inland Harbor Project in 1917 to create a number of additional ports, piers, and terminals along the southern San Francisco waterfront. In 1918, the Board of State Harbor Commissioners purchased and infilled the lots along the southern bank of the Islais Creek Channel.[11] Work along the first section of reclaimed land was completed by 1939.[12] The Port used the majority of the piers in the city for industrial production during World War II; the Port returned the piers to commercial use in the late 1940s and 1950s.[13,14]

In 1962, the Port announced its plans to enclose and fill 22 blocks of tidelands on the south side of Islais Creek, which extended the project site's parcel and created the piers east of Pier 90, including the project site. The plan was part of ongoing efforts of government agencies and industrialists to develop the last vacant industrially zoned land in San Francisco.[15] Between 1962 and 1964, the project site's reclaimed land (Pier 92) was created.[16,17] Upon creation of the project site, the pier was put to commercial use as a container ship terminal. Various imports and exports were handled through the container terminal from the 1960s to the 1980s, necessitating associated equipment, machinery, and materials on land. In the 1960s, in particular, Volkswagen used a section of Pier 92 to import automobiles into Northern California.[18] In the 1970s and 1980s, a section of the pier was a common destination and berth for international tankers that transported or stored large quantities of liquids or gases.[19]

The project site has been operating as a sand processing facility since at least 1982. From 1982 to 1999, Tidewater Sand and Gravel Company operated at the site under a permit issued by the San Francisco Bay Conservation and Development Commission (BCDC).[20] The permit was amended six times during between 1982 and 2004 to provide operating extensions and adjust the description of anticipated construction. Notably, beginning in 1988, the permit and subsequent amendments

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10 San Francisco Planning Department, *Central Waterfront Cultural Resources Survey,* prepared for the City and County of San Francisco Planning Department. October 2011.

11 Architectural Resources Group, Inc., *Pier 90 Historic Resource Evaluation,* prepared for the Port of San Francisco, January 2018.

12 U.S. Geological Survey, *San Mateo, CA* [topographic map], 1:250,000, 15-minute series, Denver, CO: USGS, surveyed 1939.

13 Corbett, Michael R., *Port City: The History and Transformation of the Port of San Francisco, 1848–2010,* 62–63, San Francisco: San Francisco Architectural Heritage, 2001.

14 Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 1968, *https://www.historicaerials.com/viewer,* accessed April 12, 2025.

15 Kelley & Verplanck Historical Resources Consulting, *Bayview-Hunters Point Area B Survey Town Center Activity Node, San Francisco, California,* prepared for the San Francisco Redevelopment Agency, February 2010.

16 Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 1956, *https://www.historicaerials.com/viewer,* accessed April 12, 2025.

17 U.S. Geological Survey, *San Francisco, CA* [topographic map], 1:250,000, 15-minute series, Denver, CO: USGS, surveyed 1956.

18 *San Francisco Examiner,* "Landmark for VW Imports," January 26, 1964:18.

19 Ibid., "Ships," January 8, 1980:44.

20 San Francisco Bay Conservation and Development Commission, Permit No. M81-55 (issued on March 4, 1982, and amended in 1985, 1988, 1994, 1998, 1999). The projects authorized by these permits were determined to be categorically exempt from the requirement to prepare an environmental impact report pursuant to California Code of Regulations, Title 14, Section 11501, Categorical Exemptions (formerly Section 10910, which was renumbered to Section 11501, effective June 17, 1987).

allowed the facility to convert its existing sand reclamation operation from a hydraulic sand unloading system to a dry conveyor belt system.[21]

In the mid-1990s, additional raw material stockpiles and temporary machinery were added to the project site. As part of Amendment No. Five, requested in 1998 and granted in 1999, the Port authorized the Tidewater Sand and Gravel Company to complete the following work between 1998 and 2003:

(1) Convert the existing sand reclamation operation from a hydraulic sand unloading system to a dry conveyor belt by: removing the existing intake and discharge pipelines from the Commission's jurisdiction; constructing a new receiving platform and conveyor involving 605 square feet of pile-supported fill and installation two dolphins and constructing the remaining 600 square feet of the conveyor within the 100-foot shoreline band; and

(2) Construct improvement in order to comply with San Francisco Bay Regional Water Quality Control Board discharge requirements by: replacing riprap along a 100-foot section of the bank of Islais Creek; excavating an approximately 60-foot-long by 3-foot-deep by 25-foot wide basin in the 100-foot shoreline band in order to expand an existing settling basin; and placing a row of 2-foot by 2-foot by 4-foot concrete blocks around the perimeter of the basin; and

(3) Remove an old, 2,000-square-foot timber pier, consisting of approximately 50 pilings and some remaining wood-timbered decking by demolishing the decking and pulling out of cutting the pilings below the mudline from a barge in the Bay and disposing the material at an upland disposal site out the Commission's jurisdiction (Amendment No. Five).[22]

In Amendment No. Six letter dated March 2004, BCDC granted Hanson Aggregates Mid-Pacific, Inc. (acquired from the Tidewater Sand and Gravel Company) an extension of completion time until August 1, 2008, of permission previously granted to conduct various activities related to shore-side sand mining facilities in BCDC Permit No. M81-55.[23] In 2017, Hanson Aggregates Mid-Pacific, Inc. (hereafter referred to as Lehigh Hanson) applied for an operating permit pursuant to Air District Regulation 2-1-302. Lehigh Hanson subsequently applied for a permit in August 2017, and the Air District began an evaluation of the permit. In October 2021, Martin Marietta acquired the Pier 92 facility (project site). At the time, Lehigh Hanson's 2017 permit application was still pending before the Air District. In July 2023, after discussions with the Port and the Air District, Martin Marietta proposed modernizing the Pier 92 facility (the proposed project) in lieu of continuing to process the pending 2017 permit application. At that point, Martin Marietta withdrew the 2017 application and began working with the Air District to clarify the scope of the

[21] Ibid.
[22] Ibid.
[23] San Francisco Bay Conservation and Development Commission, Permit No. M81-55 (Amendment No. Six). 2004.

new application. The existing facility is currently operating pursuant to interim conditions issued by the Air District in 2024.[24]

Air District records and correspondence, BCDC permit records, planning applications submitted to the department, archival maps, and historic aerial photographs were reviewed to determine visible site alterations and machinery installations since the early 20th century. A chronological summary of site changes observed from maps and aerial photography is presented in Table 1. The estimated construction dates of all extant features follow Table 1.

Table 1. Archival Map and Aerial Photograph Review

Map/Photograph	Results
1915 San Mateo, CA. USGS (1":250,000') Topographic Map, Aerial Photo Year 1915; Field Check Year N/A.	This map depicts the project site before the land was reclaimed.
1939 San Mateo, CA. USGS (1":250,000') Topographic Map, Aerial Photo Year 1939; Field Check Year N/A.	This map depicts the first section of reclaimed land (labeled Pier 92), extending east from the developed area of the Bayview neighborhood, and creation of the Islais Creek Channel.
1950 Sanborn Fire Insurance Map.	This map depicts Pier 92, the Islais Creek Grain Terminal (state property), as the farthest eastern extension of reclaimed land south of the Islais Creek Channel.
1956 Aerial Photograph (NETR 1956); 1956 San Francisco, CA. USGS (1":250,000') Topographic Map, Aerial Photo Year 1956; Field Check Year 1956.	These maps depict the project site before the land was reclaimed. The reclaimed land extends to a point approximately 600 feet west of the project site, with numerous docks extending to the east and into San Francisco Bay.
1960 USGS Aerial Photo, Single Frame (Entity ID: ARB590450100744).	This map depicts a small expansion of reclaimed land south of Pier 90, which alters the waterfront south of the Islais Creek Channel.
1965 Aerial Photograph (Cartwright Aerial Surveys 1965).	This map depicts an expansion of the reclaimed land to the east, which created the land where the project site is located and the land for the Pier 94 wetlands (extant) to the southeast. A road begins at Pier 90, to the west, and follows the new waterfront boundary eastward across the project site, then southeast around Piers 94 and 96 until connecting with Jennings Street.
1968 Aerial Photograph (NETR 1968).	This map depicts an expansion of the reclaimed land to the east, which created the land where the project site is located and the land for the Pier 94 wetlands (extant) to the east.

[24] Bay Area Air District, *Conditional Order for Abatement*, April 24, 2024, available at *https://www.baaqmd.gov/~/media/files/board-of-directors/hearing-board/agendas/2024-hb/20240424-cofa-pdf.pdf?rev=031f6f0561aa40cc951b3f0f742ce28d&sc_lang=en*, accessed June 25, 2025.

Map/Photograph	Results
1980 Aerial Photograph (NETR 1980).	This map depicts another expansion of reclaimed land, this time to the southeast to create the land for Pier 96. Structures sit on the property to the west (extant concrete plant). In addition, the project site is cleared of natural vegetation and exhibits signs of roads. A single narrow dock extends into Islais Creek Channel to the north.
1982 Aerial Photograph (NETR 1982).	This map depicts the project site, featuring more formalized gravel paths that wind around and through the site. A raw material stockpile and what appears to be a portable building are extant on the project site.
1987 Aerial Photograph (NETR 1987).	This map depicts the project site with numerous raw material stockpiles clustered at the center. Most of the site is grassland, though sand paths continue to traverse the site.
1993 Aerial Photograph (NETR 1993).	This map depicts the project site with a conveyor belt along the Islais Creek Channel dock and extending to the raw material stockpiles at the center of the site.
2002 Aerial Photograph (NETR 2002).	This map depicts the project site with a more formal sand boundary and one distinct sand path providing pedestrian or automotive access to the site from the south. Additional machinery and conveyor belts surround the centralized raw material stockpiles. Equipment and portable buildings line the eastern edge of the project site, including what is likely the fueling station. A pool-like structure is east of the conveyor belt from the Islais Creek Channel. Another structure has been added to the concrete plant to the west (extant) and abuts the western boundary of the project site. A tower structure sits to the southwest.
2009 Aerial Photograph (NETR 2009).	This map depicts the project site with the fueling station and all the other ancillary buildings removed. A new fueling station has been added near the site's southwest corner (extant) as well as two narrow ancillary buildings (extant) for bathrooms, life safety equipment storage, and meeting space along the southern edge of the project site.

NETR = Nationwide Environmental Title Research
USGS = U.S. Geological Survey

The current configuration of the sand processing plant on the project site dates to c. 2011. The various sand processing equipment from the 1990s were the oldest built components within the project site boundary. 'The extant fueling station, the oldest extant and semi-permanent built component on the site, was relocated to a different location on the site between 2018 and 2020 (**Figures 1** through **9**, pp. 4 through 7).[25,26]

As part of the project, Martin Marietta Materials will replace much of the sand processing plant equipment, including the washing equipment, sprinklers, and numerous belts. In addition, much of the site will be paved for easier vehicle access, and the nearby public access point to the adjacent public wetlands—currently at the eastern boundary of the site—will be relocated southeast of the site.

[25] NETR 2018 Nationwide Environmental Title Research, LLC, aerial photographs (37.74634120764837, -122.37734229253938), 2018, *https://www.historicaerials.com/viewer,* accessed April 12, 2025.
[26] Ibid., 2020.

3. FOCUSED NEIGHBORHOOD CONTEXT

Bayview Neighborhood

Bayview is a large residential and industrial district in southeast San Francisco, covering 3,132 acres and encompassing neighborhoods like Hunters Point, India Basin, Silver Terrace, and Bret Harte. Its boundaries are Cesar Chavez Boulevard to the north, San Francisco Bay to the east, the U.S. 101 (Bayshore Freeway) to the west, Candlestick Hill to the south, and the San Francisco Bay to the east and south. Initially characterized by coastal grasslands, sage scrub hillsides, and marshlands, the area underwent significant transformation from the era of Spanish explorers and native Ohlone inhabitants to a diverse community with settlers from various ethnic backgrounds.[27]

The area's industrial history began with the construction of the San Francisco Dry Dock at Hunters Point in 1866, followed by the establishment of Butchertown on Islais Creek and later the formation of the Islais Creek Channel. Throughout the 20th century, marsh and tideland infill projects transformed the waterfront along the Bayview neighborhood. Specifically, the formation of the Islais Creek Reclamation District and subsequent creation of a 2,000-foot-long rock seawall to create the Islais Creek Channel and associated piers for commercial and industrial use reshaped both the land and the character of the neighborhood.[28] By World War I, the industrial belt extended southward along the Central Waterfront to Islais Creek, leading to extensive landfill for industrial sites. The prominence of the Bayview neighborhood grew during World War II when the U.S. Navy acquired the Hunters Point Dry Dock, attracting thousands of war workers, many of whom were African American, and solidifying Bayview as a major industrial zone on the West Coast.[29]

4. OWNER/OCCUPANT HISTORY

Since the land's reclamation, including absorption of APN 4502A002, the Port has owned the project site. A small ship terminal at Pier 92 was operated by the Port when the land was reclaimed in the 1960s; this continued into the early 1980s, supported by limited equipment and temporary raw material stockpiling on the land. In 1996, the Port leased space on Pier 92 west of the project site to Mission Valley Rock, a rock and gravel production company. Mission Valley Rock added equipment to the land west of the project site in the late 1990s (CEMEX currently operates the adjacent concrete plant. See **Figure 1**, p. 3, turquoise polygon labeled Pier 92 Concrete Plant, separate from the project site).

To the east of Pier 92, the project site has been operating as a sand processing facility since at least 1982. In 1999, Hanson Building Materials America acquired the facility from Tidewater Sand and Gravel

[27] Kelley & Verplanck Historical Resources Consulting, *Bayview-Hunters Point Area B Survey Town Center Activity Node, San Francisco, California,* prepared for the San Francisco Redevelopment Agency, February 2010.

[28] San Francisco Planning Department, *Central Waterfront Cultural Resources Survey,* prepared for the City and County of San Francisco Planning Department. October 2011.

[29] Kelley & Verplanck Historical Resources Consulting, *Bayview-Hunters Point Area B Survey Town Center Activity Node, San Francisco, California,* prepared for the San Francisco Redevelopment Agency, February 2010.

Company[30] and continued sand processing operations at the site as Hanson Aggregates Mid-Pacific, Inc. (later known as Lehigh Hanson) under a permit extension issued by BCDC in 2004.[31]

Martin Marietta Materials has leased the project site for sand processing plant operations since October 2021. Martin Marietta Materials is an American-based company and leading supplier of building materials, including aggregates, cement, ready-mixed concrete, and asphalt, with operations in 28 states, Canada, and the Bahamas. Five employees currently work at the Pier 92 facility.[32] See the Site History section (p. 8) above for more details on site development and operational changes.

5. ARCHITECT/BUILDER/LANDSCAPE ARCHITECT

The project site contains raw material stockpiles, sprayers, conveyor belts, storage structures, mechanical equipment associated with sand processing, and ancillary buildings, which have been added to the facility over the last couple of decades. The project site is unpaved; informal paths traverse the sand on the site. There are no built resources or landscaping elements that were designed or constructed by an identifiable architect, builder, or landscape architect. Site alterations and changes to mechanical equipment and portable buildings were discerned from analyses of historic maps and aerial photographs, searches through historic newspapers as well as HREs and historic contexts for similar properties in the vicinity, and analyses of data obtained from the San Francisco Property Information Map and similar online repositories.

6. CALIFORNIA REGISTER SIGNIFICANCE EVALUATION

Evaluative Framework

The criteria for listing historical resources in the California Register are consistent with those developed by the National Park Service for listing historical resources in the National Register but have been modified for state use in order to include a range of historical resources that better reflect the history of California.

Public Resources Code section 5024.1 establishes the California Register, which it describes it as "an authoritative guide in California to be used by state and local agencies, private groups, and citizens to identify the state's historical resources and to indicate what properties are to be protected, to the extent prudent and feasible, from substantial adverse change."

The California Register automatically includes all properties listed in or determined eligible for listing in the National Register as well as some California Historical Landmarks and California Points of Historical Interest. Title 14 of the California Code of Regulations (CCR), section 4852, governs eligibility for listing in the California Register and it sets forth the criteria for evaluating significance and the historical integrity of that significance.

A resource must have significance at the local, state, or national level under one or more of the four criteria listed below to be eligible for listing in the California Register.

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30 Maritime News, *Hanson Acquires Tidewater and Moe Sand*, 1999, *https://www.marinelink.com/news/tidewater-acquires-hanson303918*, accessed July 16, 2025.

31 San Francisco Bay Conservation and Development Commission, Permit No. M81-55, Amendment No. Six, (issued March 16, 2004)

32 Martin Marietta Materials, *About Us*, 2025, *https://www.martinmarietta.com/about-us,* accessed April 16, 2025.

1. The resource is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history or the cultural heritage of California or the United States (Criterion 1).
2. The resource is associated with the lives of persons important to local, California, or national history (Criterion 2).
3. The resource embodies the distinctive characteristics of a type, period, region, or method of construction or represent the work of a master or possess high artistic values (Criterion 3).
4. The resource has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California, or the nation (Criterion 4).

In addition, CCR. Title 14, section 4852(d)(2), establishes a threshold for historical resources that achieved significance within the past 50 years:

> In order to understand the historic importance of a resource, sufficient time must have passed to obtain a scholarly perspective on the events or individuals associated with the resource. A resource less than fifty (50) years old may be considered for listing in the California Register if it can be demonstrated that sufficient time has passed to understand its historical importance.

a. Individual Significance Analysis

The project site does not contain a built component older than 50 years; thus, the built components of the Pier 92 facility were evaluated to determine if they are significant at the local, state, or national level and, specifically, if sufficient time has passed to understand their historical importance.

i. Criterion 1: To be considered eligible for listing under Criterion 1, a property must be associated with one or more events that have made a significant contribution to the broad patterns of California's history and cultural heritage. This criterion recognizes properties associated with single events, a pattern of events, repeated activities, or historic trends. The event or trends, however, must clearly be important within the associated context. Further, mere association of the property with historic events or trends is not enough, in and of itself, to qualify under this criterion; the specific association must be considered important as well.

Although the buildings and structures at the Pier 92 facility are associated with the larger overall development of the Port and the Bayview neighborhood, the ancillary buildings at Pier 92 were constructed long after the initial development of the Port. Moreover, the area was already well established as an industrial center by the time the first built components on the project site—structures and mechanical equipment—were added in circa the 1980s. Since the late 20th century, mechanical equipment, portable buildings, and structures on the project site have been moved and replaced, as is typical of utilitarian components that continuously serve light industrial processes. As a more contemporary addition from the late 20th century, the Pier 92 facility overall does not appear to have had a significant impact on the industrial development or economic success of the Port. As such, the project site does not appear to be significant under California Register Criterion 1.

ii. Criterion 2: To be considered eligible for listing under Criterion 2, a property must be associated with individuals whose specific contributions to history can be identified and documented. The criterion identifies properties associated with individuals whose activities are demonstrably important within a local, state, or national historic context and is typically limited to those properties that have the ability to illustrate a person's important achievements.

Like other properties on the parcel, the project site has a general association with the Port, which has continuously owned and leased the property as part of a larger effort to retain industrially zoned land in San Francisco. Similarly, the project site does not appear to be identified with an individual who was associated with the private companies that leased the site. The Pier 92 facility, especially with its operational history of less than 50 years, is not directly tied to the achievements of any one individual whose activities are demonstrably important in the history of the Port or its lessees. As such, the project site does not appear to be significant under California Register Criterion 2.

iii. Criterion 3: To be considered eligible for listing under Criterion 3, a property must embody the distinctive characteristics of a type, period, or method of construction that represents the work of a master; possess high artistic values; or represent a significant and distinguishable entity whose components may lack individual distinction. This criterion seeks structures that are important or innovative examples of their type or period of construction or have an association with exemplary building practices of a particular time in history.

The multiple raw material stockpiles, sprayers, conveyor belts, and other mechanical equipment associated with the sand processing facility were not constructed using innovative techniques, nor were they the first or only example of their kind in operation in the late 20th century. Industrial in design and utilitarian in function, the property does not represent the work of a master architect or possess high artistic values. As such, the project site does not appear to be significant under California Register Criterion 3.

b. Historic District Analysis

As previously stated, the entire parcel where the project site is located has not been previously identified as a historic district. CCR Title 14, section 4852(a)(5), establishes historic districts as "unified geographic entities which contain a concentration of historic buildings, structures, objects, or sites united historically, culturally, or architecturally. Historic districts are defined by precise geographic boundaries." A historic district must meet at least one of the criteria for significance discussed above.

Although the project site is part of a larger parcel with similar industrial and utilitarian structures and buildings, it does not compose an identifiable concentration of resources that share significant architectural or historical associations. Properties on the parcel share a general association with the overall development of the Port and its light industrial uses; however, they do not present a significant pattern in the local history of shared development or architectural patterns. The eastward expansion of the land that comprises the parcel from the early to mid-20th century included other piers at different periods of development. In addition, piers have historically been individually leased for various heterogenous industrial and institutional operations throughout the 20th century, including a fire station, grain terminal, cement plant, storage facility, and shipping

crane site. As such, the project site does not appear to qualify as part of a historic district because it does not contain elements that are united historically, culturally, or architecturally.

7. INTEGRITY

If a resource is found to have significance through application of one of the four associative criteria, then the integrity of that significance must be evaluated. Integrity is defined in CCR section 4852(c) as "the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance." A resource is required to "retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance" (CCR section 4852[c]). Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association; it must be judged with reference to its particular criterion or criteria of significance.

Because the property was not found to be significant under any of the above criteria, an evaluation of the property's physical integrity is unnecessary.

8. CHARACTER-DEFINING FEATURES

If a resource is found to have significance through application of one of the four associative criteria, then the character-defining features that represent that significance must be evaluated. Character-defining features are defined in *NPS-28: Cultural Resource Management Guideline* as "the prominent or distinctive aspect, quality, or characteristics of a historic property that contribute significantly to its physical character."[33] Structures, objects, vegetation, spatial relationships, views, furnishings, decorative details, and materials must be judged with reference to their particular criterion or criteria of significance.

Because the property was not found to be significant under any of the above criteria, an evaluation of the property's character-defining features is unnecessary.

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10. APPENDICES

Appendix A: Project Location

Appendix B: Existing Operation

Appendix C: Proposed Project

Appendix D: Proposed Lease Parcel Changes

Appendix A
Project Location



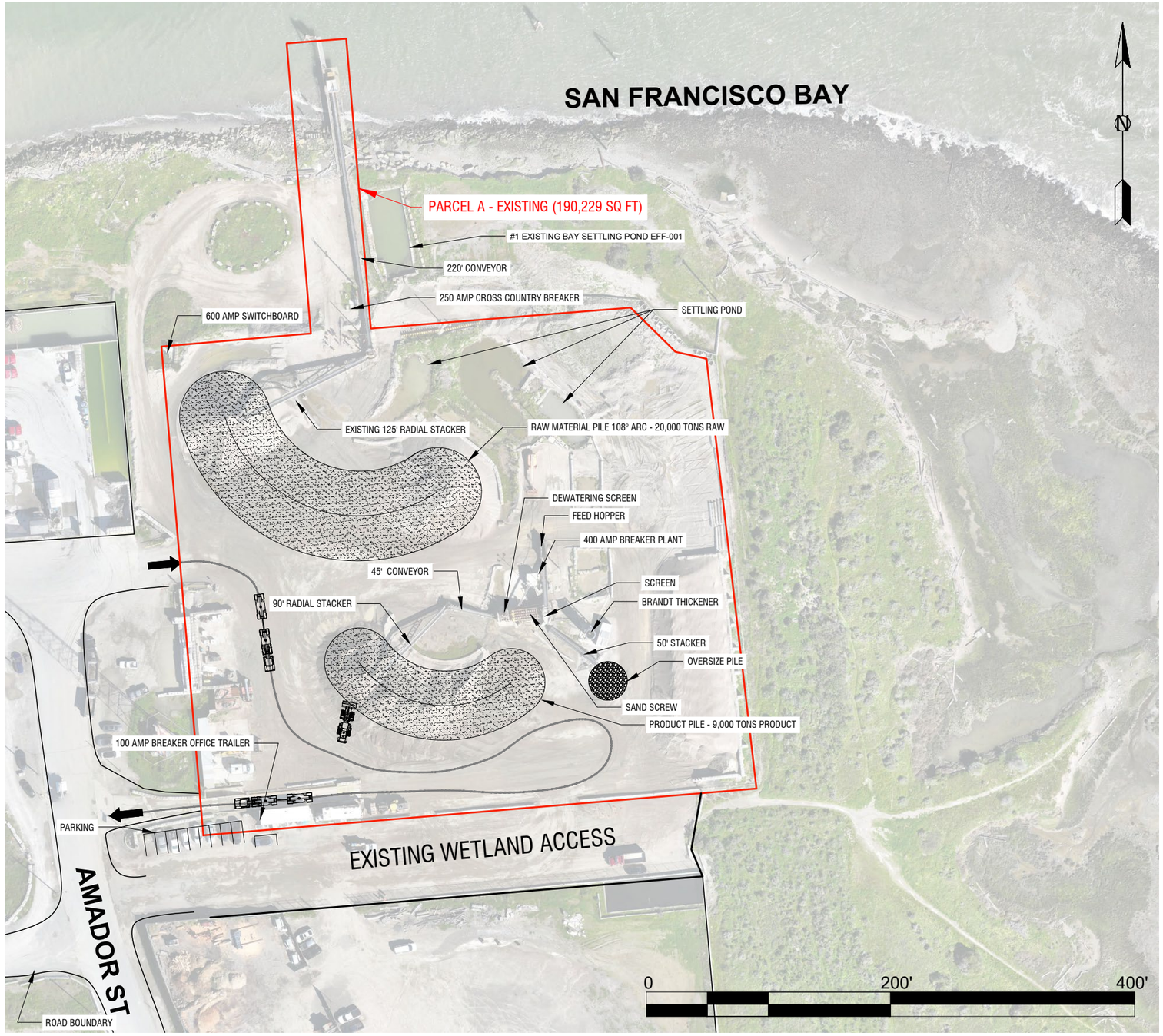
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Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 2-1
Project Location

Appendix B

Existing Operation



Source: Martin Marietta, 2025

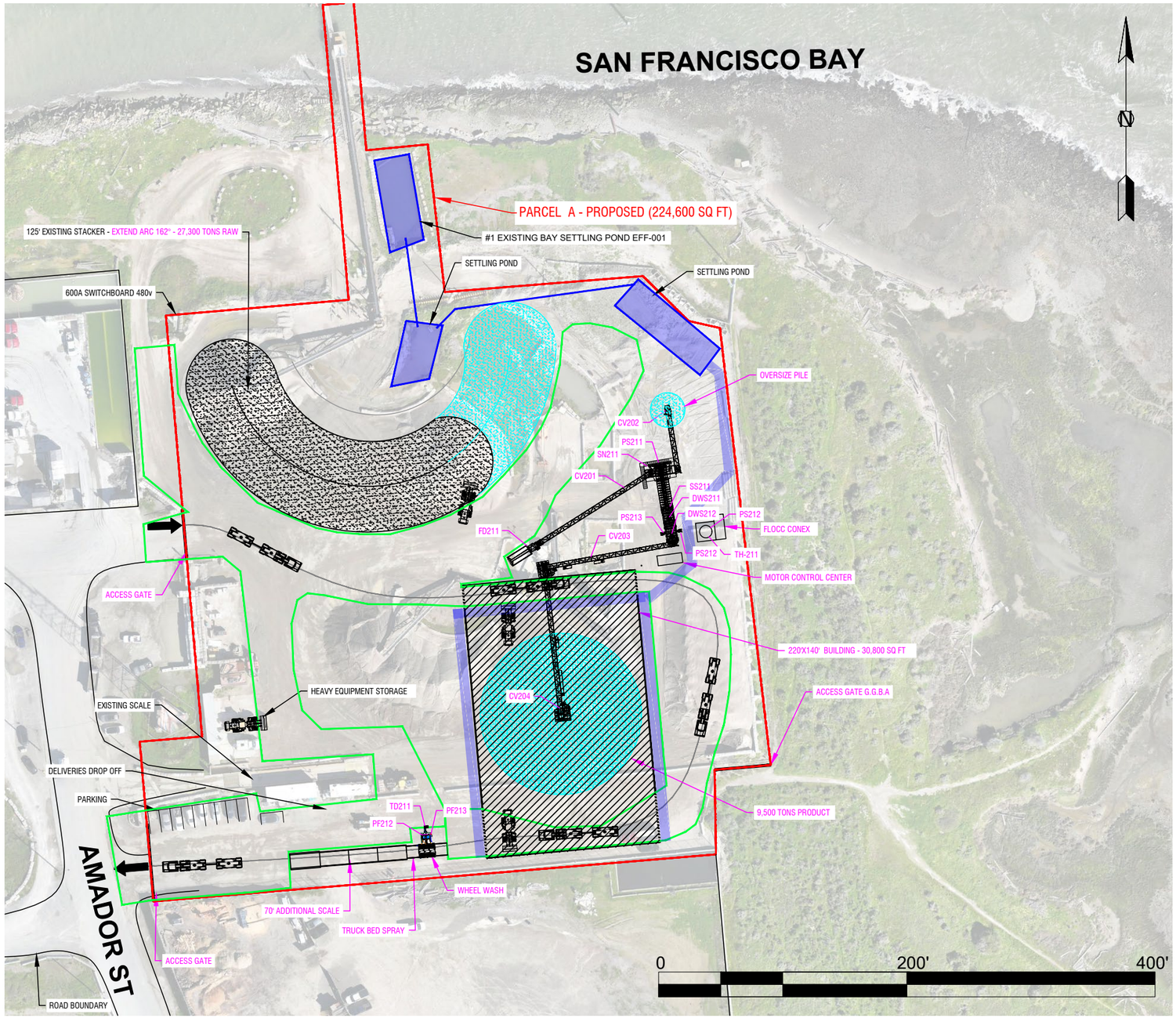
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Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 2-2
Existing Operation

Appendix C

Proposed Project



PAVING LIMITS

UNDERGROUND CONVEYANCE

VALLEY GUTTERS/CHANNELS

PARCEL BOUNDARY

WAREHOUSE STRUCTURE

WATER CONTAINMENT AREA

RELOCATED OR EXTENDED STOCKPILES

EXISTING STOCKPILES

New Equipment	ID Tag
Feed Hopper Skid Mounted	FD211
Screen 1 1D5x16	SN211
Sand Screw 1	SS211
Dewatering Screen 1	DWS211
Dewatering Screen 2	DWS212
Screen Feed Conveyor 30"x 110'	CV201
Oversize Conveyor 30"x 50'	CV202
Building Feed Conveyor 30" x 110'	CV203
Building Conveyor 30" x 128'	CV204
Screw Recirculating Pump	PS211
Thickener Feed Pump	PS212
Cyclone Feed Pump	PS213
Thickener Mud Pump	PS214
Makeup Water Pump	PS211
Wheel Wash Pump 1	PS212
Wheel Wash Pump 2	PS213
Wheel Wash Drag Chain	TD211
Wheel Wash Water Sump	TK211
Flocc Dosing Pump	
Brandt Thickener	TH211
Underflow Density Meter	
Flocc Dosing Pump 1	
CAT Dosing Pump 2	

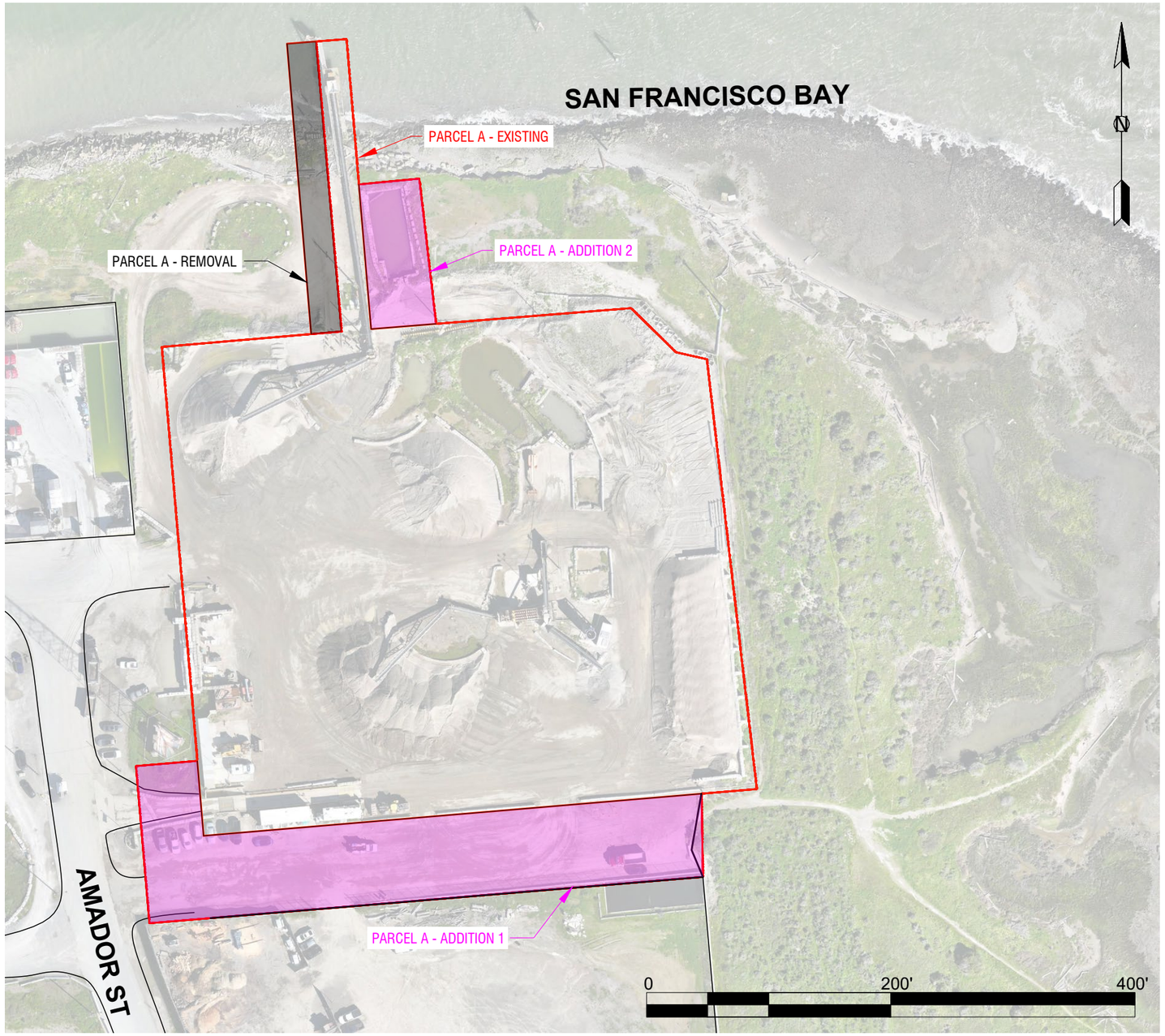
Source: Martin Marietta, 2025

Graphics - Martin_Marietta\105407_Pier_1_EIR (6-25-2025)

Figure 2-3
Proposed Project

Appendix D

Proposed Lease Parcel Changes



EXISTING LEASE PARCEL A - 190,229 SQ FT

PROPOSED LEASE PARCEL A - 224,600 SQ FT

PARCEL A - LEASE AREA REMOVAL

PARCEL A - LEASE AREA ADDITION

Source: Martin Marietta, 2025

Graphics: ...Martin_Marietta\105407_Pier_92_EIR (6-18-2025)

Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 2-4
Proposed Lease Parcel Changes

San Francisco Planning

49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103
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MEMORANDUM TO FILE

Date:	August 19th, 2025
To:	Jennifer McKellar, Senior Environmental Planner (628) 652-7563 Jennifer.McKellar@sfgov.org
Reviewed by:	Allison Vanderslice, Principal Preservation Planner CEQA Cultural Resources Team Lead (628) 652-7505 Allison.Vanderslice@sfgov.org
From:	Justin Greving, Senior Preservation Planner (628) 652-7553 Justin.Greving@sfgov.org
Re:	Pier 92 Modernization and Plant Replacement Project (2024-005922ENV)

BACKGROUND

The purpose of this memo is to summarize the findings of the "Historic Resource Evaluation for the Pier 92 modernization and Plant Replacement Project," prepared by ICF, dated July 2025, that evaluated Pier 92's eligibility for listing in the California Register of Historical Resources (California Register)and determine the potential impacts of the Pier 92 Modernization and Plant Replacement Project (proposed project). This memo also summarizes the previous evaluations that have been done on the parcel 4502A/002 which extends along the southern waterfront just south of Islais Creek from Pier 90 to Pier 96.

PROPERTY DESCRIPTION

Pier 92 is owned by the Port of San Francisco and is part of the Port's Maritime Eco-Industrial Center which extends from Pier 80 to Pier 96 in the Southern Waterfront area in San Francisco. Although Pier 92 is located on a larger parcel (APN 4502A/002) that is approximately 7,763,263 square feet, the specific area in question that is part of the proposed project is 190,229 square feet and encompasses a northern section of the lot that faces Islais Creek. The site of the proposed project currently houses a sand processing plant operated by Martin Marietta Materials and contains no permanent buildings but multiple raw material stockpiles and sprayers, conveyor belts, storage structures, and mechanical equipment associated with sand processing; temporary ancillary buildings provide space for vehicle fueling and work assistance, life safety equipment storage, and meetings. Other features on the same parcel and in the immediate vicinity of the proposed project include a concrete plant, the Pier 90 grain terminal, and Fire Station No. 25, all facing Islais Creek west of the project site. To the south and east is the Pier 94 wetlands, while further southeast is Pier 96 that contains 4 container cranes, the Pier 96 Recology Recycling Center (former LASH (lighter abord ship) terminal building), Pier 96F

administration building (former Pacific Far Eastern Lines administration building), a guardhouse, and a number of other structures.

CEQA HISTORIC RESOURCES EVALUATION

Pier 92

Planning Department preservation staff agree with the findings of the HRE part I that the sand processing plant at Pier 92 is not eligible for listing in the California Register of Historical Resources (California Register) under criteria 1, 2, or 3. The site has operated as a sand processing center since the early 1980s and as such does not have any significant or meaningful historic associations with the SF Port or Bayview neighborhood that would make it eligible under Criterion 1. There are no known individuals that have associations with Pier 92 such that it would be eligible under Criterion 2. The equipment and structures on the site are all temporary and not stationary and the site does not have any buildings or structures that would have architectural significance such that the site would be eligible under Criterion 3. The scope of this memo does not consider Criterion 4 related to archeological resources which are addressed separately.

Therefore, Pier 92 is not eligible for listing in the California Register and is not a historic resource.

Adjacent Evaluated Properties on Lot 4502A/002

Pier 92 sits within a larger parcel 4502A/002 that contains a number of different buildings and structures. Most of these other structures have been previously evaluated for California Register eligibility and determined to not be eligible for listing in the California Register. The following buildings/structures sit on parcel 4502A/002 and have been previously evaluated:

- Pier 90: Pier 90 is the site of a former grain terminal just south of Islais Creek. The site contains 3 sets of 21 grain silos, two grain elevators, 6 grain loading cranes, and a number of structures and buildings all constructed between the mid-1950s to 1970s. Pier 90 was evaluated in 2021 and determined to not be a historic resource, either individually or as a component of a historic district.[1]

- Pier 96: Some buildings and structures on Pier 96 have been evaluated. The 1-story shingle-clad "T-shaped" plan Pier 96F administration building (currently houses offices of the Hoseley Corporation) and a two-story rectangular-shaped plan guardhouse were both constructed in 1972 for Pacific Far Eastern Line. Both buildings were evaluated in 2018 and determined to not be historic resources.[2] There are also four container cranes located along the bayside of Pier 96. Two PACECO 30 long ton, steel, electric container cranes and their associated track were erected in 1972 as part of the LASH terminal, while 2 Star Iron & Steel Company 40 long ton, steel, electric container cranes were relocated to their current location in 2011 after having been originally installed further north at Pier 94-E. All four container cranes have been evaluated and determined to not be historic resources.[3]

- Fire Station No. 25: Fire Station No. 25 is located at 3305 3rd Street that was constructed in 1927 and

[1] "PORT: Port of San Francisco 2019 Draft Waterfront Plan – Pier 90 Part I Historic Resource Evaluation Response," prepared by ARG, 2019-023037ENV, 3/31/2021.

[2] "Pier 96 Preservation Team Review Form," 2016-009846ENV, 11/1/2018.

[3] "Historic Resource Evaluation Pier 96 – Container Cranes, San Francisco, CA," architecture + history, llc July 2025.

designed by John Reid Jr. The building was first evaluated in 1994 and determined to be eligible for listing in the National Register. Fire Station No. 25 is individually listed in the California Register and as such is a historic resource.[4]

In conclusion, the only identified historic resource location on parcel 4502A/002 is Fire Station No. 25. Additionally, given the disparate functions of the different areas within the parcel there is no historic district that would encompass piers 90-96 located within the parcel.

Adjacent Historic Resources

The only identified historic resource that is immediately adjacent to lot 4502A/002 is the Islais Creek Bridge which was determined to be individually eligible for listing in the National Register and is listed in the California Register.[5]

PROJECT IMPACTS

Proposed Project

The project proposes the installation and operation of a new, modern sand processing plant with enhanced environmental controls and site upgrades. The project will be implemented pursuant to an updated lease with the Port of San Francisco and operated pursuant to permits from the Bay Area Air District.

Impacts to Historic Resources

The proposed project will not have any direct or indirect impact on historic resources. The project site has been determined to be not a historic resource therefore the proposed project will not have a direct impact on any historic resources. The closest historic resources are Fire Station No. 25, which is located on the same parcel as the project site but faces 3rd Street and is approximately half a mile from the project site, and the Islais Creek Bridge, which crosses Islais Creek at 3rd Street. Given the distance these historic resources have from the project site there is no potential for the proposed project to have an indirect impact on either historic resource.

CONCLUSION

Planning Department preservation staff have reviewed the findings of the HRE Part I and determined that the project site does not contain any historic resources. Additionally planning department staff have reviewed all previous documentation for parcel 4502A/002 and determined that the only historic resource on the parcel is Fire Station No. 25. The closest adjacent historic resource is the Islais Creek Bridge. Based on these findings planning department staff conclude that the proposed project will have no impact on historic resources.

Note this HRE has not been previously evaluated by Planning Department preservation staff and therefore the findings of this HRE are summarized above. Planning Department Preservation staff agree with the conclusions in this HRE.

[4] "Historic Resource Evaluation for the Pier 92 modernization and Plant Replacement Project," ICF, July 2025, 2.

[5] "Draft Environmental Impact Report: Islais Creek Bridge Project," 2022-000112ENV, November 29, 2023.



Figure 1: APN 4502A/002 outlined in yellow with locations of other site features. Note the project site is shaded in red ("Historic Resource Evaluation for the Pier 92 modernization and Plant Replacement Project," prepared by ICF, dated July 2025, 3).

APPENDIX D
TRANSPORTATION SUPPORTING INFORMATION

LCW Consulting

Adavant Consulting

Memorandum

To: Sherie George and Jennifer McKellar, San Francisco Planning Department

From: José I. Farrán, Adavant Consulting and Luba Wyznyckyj, LCW Consulting

Date: October 3, 2025 – **FINAL VERSION**

Re: Pier 92 Modernization Project – Project Travel Demand
Case No. 2024-005922ENV

This memorandum summarizes the assumptions and methodology used to develop the travel demand estimates for use in the environmental impact analysis of the proposed Pier 92 Modernization and Plant Replacement Project (proposed project) at the Port of San Francisco (Port). Results of the travel demand analysis documented in this memorandum are used in the transportation, air quality and noise operational analyses.

The memorandum is organized into the following sections:

1. Background
2. Existing Counts
3. Travel Demand Approach
4. Existing Baseline Condition
5. Project Reasonable Peak Condition
6. Project Maximum Condition
7. Project Travel Demand Summary
8. Truck Distances

More detailed information is provided in **Appendix A** through **Appendix C.**

1. Background

The proposed project consists of the reconstruction and modernization of the existing sand processing facility on Pier 92. The proposed project would install and operate a new sand processing system with new equipment, enhanced environmental controls, and other site upgrades. The essential nature of the existing operations at the facility would not change under the proposed project.

The sand offloaded by barge and processed at the Pier 92 facility is used in a variety of applications. Customers transport or contract for delivery by truck of the material to end users and construction sites. The bulk of the processed sand at the facility (about 65 percent) is transported by truck to the two adjacent ready-mix concrete facilities located on Pier 92. The rest of the processed sand (about 35 percent) is transported by truck to projects throughout the city and San Mateo County.

The volume of sand processed at the Pier 92 facility has varied substantially over the past 25 years, reflecting the cyclical nature of the construction industry. A peak of approximately 664,000 tons of sand was processed in 2018 while only 118,000 tons was processed in 2011.[1] Martin Marietta, the owner of the facility, has applied for authority to construct and a permit to operate from the Bay Area Air District (Air District) to receive and process up to 800,000 tons of sand during any consecutive 12-month period. The maximum truck throughput that would be permitted would be 300 trucks per day.[2]

2. Travel Demand Approach

The amount of sand processed at the Pier 92 facility and transported off-site varies by year and day depending on market demand (i.e., construction activity) and is not related to the proposed project's physical changes at the project site. Therefore, the travel demand estimates used the following information to determine the increase in the number of project-generated vehicles on a daily and peak hour basis for use in the environmental impact analysis: existing vehicle counts and operating characteristics (e.g., number of employees, hours of operation) of the Pier 92 facility, historical annual sand processing and truck throughput data for the past 24 years, and Martin Marietta's Air District permit application for sand processing and truck throughput maximums.

The travel demand analysis was prepared for the following conditions:

- **Existing Counts:** This condition documents the existing operations at the project site in March 2025 when counts of vehicles entering and exiting the facility were conducted. The existing counts serve as a basis for developing the existing baseline condition that will be used in the environmental impact analysis.

- **Existing Baseline:** Due to the cyclical nature of the facility's operations based on market demand, for purposes of environmental review, existing baseline conditions are established from the facility's activity over the most recent 5-year operating period (2020-2024), and not the maximum activity achieved over the facility's history. As described below, the existing baseline condition represents conditions at the project site that reflect a representative day over the past 5-year period.

---

1 Information prepared and provided by Martin Marietta and received through the SF Planning Department; email from Jennifer McKellar (SF Planning Department) to José I, Farrán (Adavant Consulting), April 2, 2025.

2 Martin Marietta, Bay Area Air Quality Management District Authority to Construct Application, March 2024, p. 2-2.

- **Project Reasonable Peak:** The project reasonable peak conditions represents future conditions consistent with Martin Marietta's Air District permit application (i.e., increases in daily sand processing and truck throughput) for conditions that would not require changing the typical operating procedures. As described below, this condition reflects about 80 percent of the maximum daily truck throughout that would be permitted by the Air District. This is a conservative assumption for purposes of environmental review as this level of activity at the Pier 92 facility has only been reached on one day in October 2016 for the years 2016 and 2018-2024 (there is no daily truck data available for 2017 from Martin Marietta).

- **Project Maximum:** The project maximum conditions represents the maximum daily truck throughput (i.e., 100 percent) that would be permitted by the Air District. As described below, daily truck throughput exceeding 240 rarely occurs and is not reflective of conditions throughout the majority of the year (this level of truck activity was not reached between 2018 and 2024 and occurred once in 2016), and the maximum daily truck throughput per Martin Marietta's Air District application is likely to also occur infrequently.

The results of the travel demand analysis are used in the transportation and circulation, air quality and noise operational analyses by comparing the project reasonable peak and the project maximum conditions to the existing baseline condition to present the impacts attributable to the proposed project.

3.0 EXISTING COUNTS

In order to establish the existing travel demand conditions at the sand processing facility on Pier 92, the transportation consultants performed a 24-hour video recording of inbound and outbound vehicles over a two-day period. Two cameras were positioned in front of the three[3] existing driveways to the project site on Amador Street. The data was collected on Wednesday, April 23, and Thursday, April 24, 2025, and included turning movement (e.g., left or right turn out of the project driveway) and vehicle classification counts (e.g., super dump trucks, end up dump trucks).[4] Martin Marietta identified the count dates as reflecting typical operating conditions at the Pier 92 facility.

According to the collected data, the driveways at the existing sand processing facility open at about 5:30 a.m. and close soon after 2 p.m. Trucks start arriving at about 6 a.m., until closing. Trucks accessing the project site were classified into seven categories according to

[3] There is a truck inbound access driveway on Amador Street at the northwest side of the site, and a truck outbound access driveway towards the southwest end of the site. In addition, there is a two-way driveway further to the south that provides access to two modular trailers that serve as administrative offices, and to surface parking for at least ten employee or visitor vehicles.

[4] See **Appendix A** for a detailed description of the various truck types.

their configuration and approximate payload capacity.[5] A detailed description of the truck types accessing the project site is included in **Appendix A**. A summary of the truck types and other vehicle counts is provided in **Table 1** below. No trips to or from the project site were observed to be made by walking or bicycling on either day. No passenger drop-offs or pick-ups were observed during the count periods; one delivery vehicle, a FedEx step van was observed on April 24, no delivery or service vehicles were observed on April 23.

Table 1
Pier 92 - Martin Marietta Marine Aggregates Plant
Existing Daily Vehicle Counts

Vehicle Classification	April 23, 2025				April 24, 2024			
	Inbound		Outbound		Inbound		Outbound	
	From Amador West	From Amador South	To Amador West	To Amador South	From Amador West	From Amador South	To Amador West	To Amador South
Trucks [a]								
Bob tail	-	1	1	-	-	-	-	-
3-axle 10-wheel single	3	-	3	-	1	-	1	-
5-axle 10-wheel double	1	1	2	-	-	-	-	-
Super dump	12	2	14	-	2	2	4	-
End up	3	-	3	-	4	3	7	-
Double bottom	1	-	1	-	5	2	7	-
Pick up	-	1	-	1	1	-	-	1
Water sprinkler tank	-	1	1	-	-	1	1	-
Road sweeper	1	-	-	1	1	-	-	1
Subtotal Trucks	*21*	*6*	*25*	*2*	*14*	*8*	*20*	*2*
	78%	*22%*	*93%*	*7%*	*64%*	*36%*	*91%*	*9%*
Autos/vans [b]	6	3	6	3	3	4 [c]	4	3 [c]
Total	**27**	**9**	**31**	**5**	**17**	**12**	**24**	**5**

Source: Adavant Consulting/LCW Consulting, July 2025.
Notes:
a. See **Appendix A** for a detailed description of the truck types and respective payload capacities.
b. Employee and visitor vehicles entering/exiting from/to the southernmost project site driveway, and parking next to the modular trailers that serve as administrative offices. There are currently five employees working at the Pier 92 facility.
c. Includes one FedEx step van entering and exiting the site around 10 a.m.

[5] Truck payload capacity refers to the maximum weight of cargo a truck can safely carry, in addition to its own weight.

As shown in Table 1, a total of 36 vehicles entered and exited the project site on April 23, including 25 sand trucks[6], one water sprinkler tank truck, a road sweeper truck, and nine employee or visitors vehicles. Almost 80 percent of the trucks arrived from Amador Street west, while more than 90 percent exited the project site towards Amador Street west. On April 24, 29 total vehicles entered and exited the project site, including 20 sand trucks, one water sprinkler tank truck, a road sweeper truck, and seven employee or visitors vehicles. Almost 64 percent of the trucks arrived from Amador Street west, while more than 90 percent exited the project site towards Amador Street west.

Because Wednesday, April 23, 2025, had the highest number of vehicles (36 total vehicles entering and exiting the project site) of both days, it was selected as a representative of existing travel demand conditions for the purpose of environmental review. These include a total of 25 round-trip sand truck trips over an 8-hour period (6 a.m. to 2 p.m.), with an average arrival interval of 19 minutes between trucks, plus nine additional daily employee and/or visitor round-trips by autos and vans related to the Pier 92 facility operations.

On April 23, 2025, the vehicle peak hour of activity at the Pier 92 facility occurred between 9:15 a.m. and 10:15 a.m. and included a total of 14 vehicles. Of these, 11 were trucks (six inbound and five outbound), and three were employee/visitor vehicles (two inbound and one outbound). See Appendix A for more detailed hourly data throughout the day.

4. Existing Baseline Condition

The volume of sand processed at the facility varies cyclically throughout the years, based on market demand. Martin Marietta provided annual sand processing data for the past 24 years that indicate that the current activity at the Pier 92 facility represents the lower end of the cycle for the current period based on data distribution. Thus, in order to develop an existing baseline condition for the purpose of environmental review, the transportation consultants evaluated daily truck activity data provided by Martin Marietta for the most recent 5-year operating period from January 2020 through December 2024. The daily round-trip truck trip data for each day during the period is summarized in Figure 1 on the next page; additional information is included in Appendix B.

[6] Sand trucks include bob tail, 3-axel 10-wheel single, 5-axel 10-wheel double, super dump, end up, double bottom, and pickup vehicles.

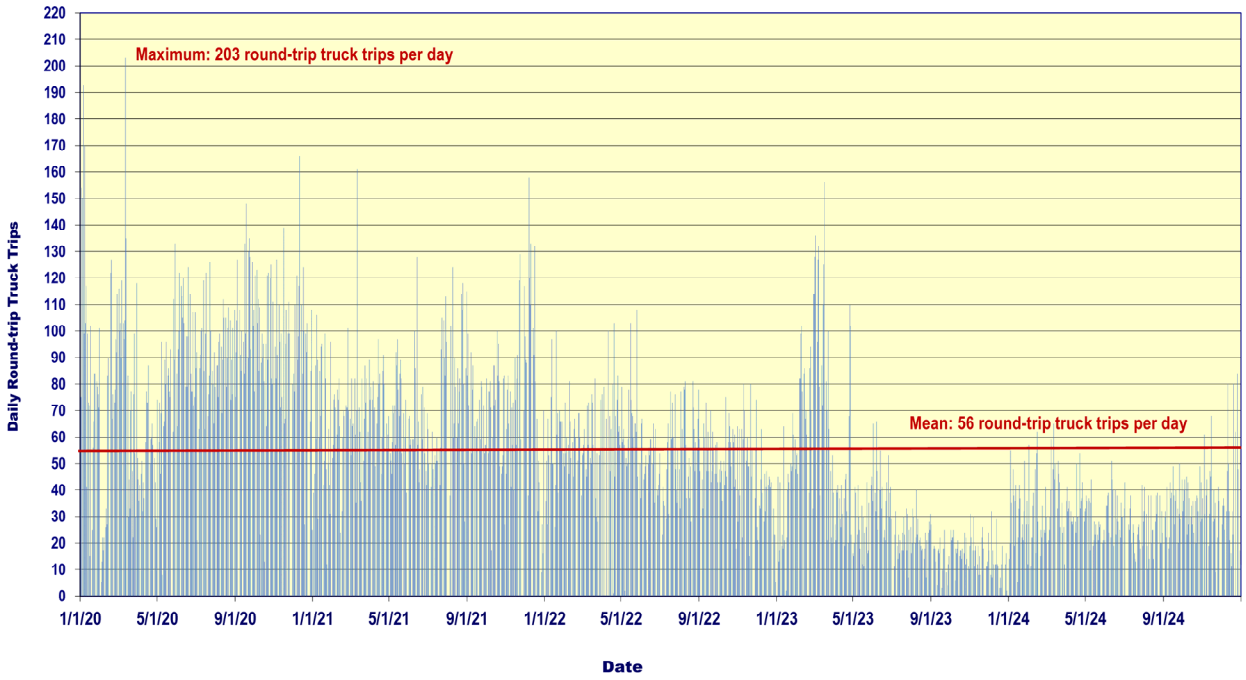


Figure 1
Pier 92 - Martin Marietta Marine Aggregates Plant
Daily Round-Trip Truck Trips: January 1, 2020 through December 31, 2024
Source: Martin Marietta

As shown in the figure, the maximum truck demand over the 2020-2024 period occurred on one day in March 2020 with 203 round-trip truck trips per day. The mean (average) value for the same period is 56 round-trip truck trips per day. **Figure 2** shows the frequency distribution curve of truck demand at the Pier 92 facility during the 2020-2024 period, grouped at five vehicle intervals. The figure also includes various statistical parameters of the sample (i.e., the data set), such as the mode, the median, and the mean.[7]

[7] In statistics, mode is defined as the value that appears most frequently in a data set, median is the middle value in a data set when those numbers are arranged in ascending order, while mean, also known as the average, is a measure of central tendency that represents the typical value in a data set.

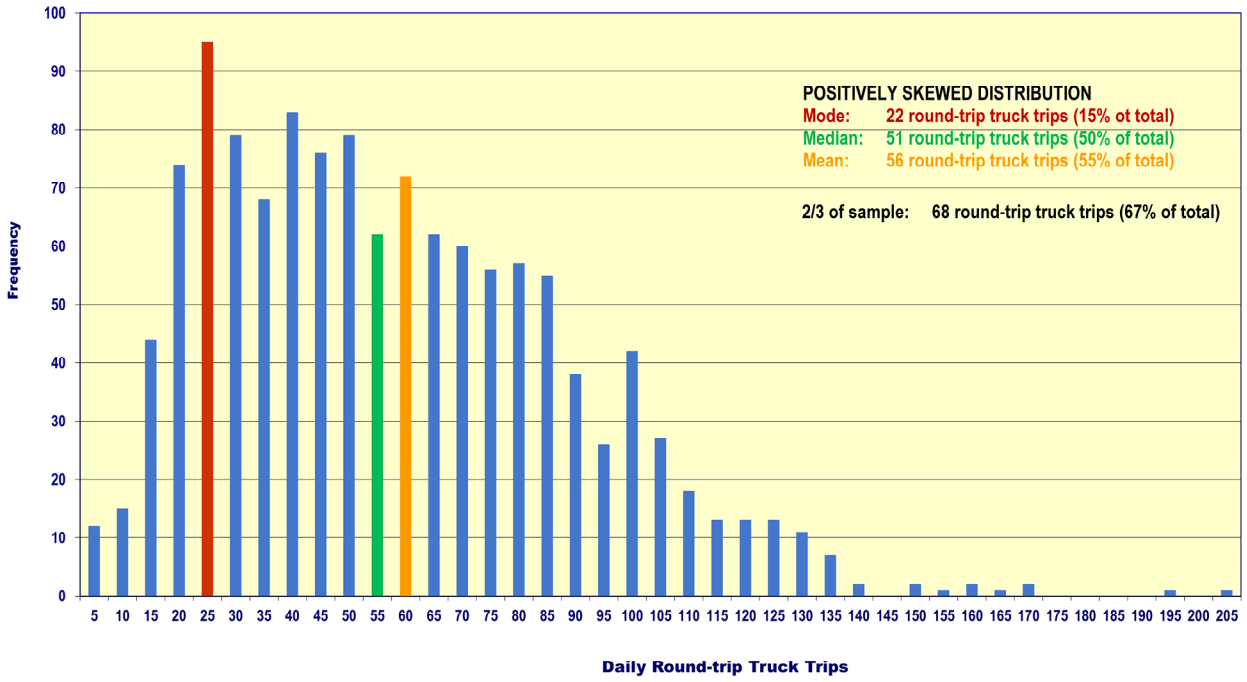


Figure 2
Pier 92 - Martin Marietta Marine Aggregates Plant
Daily Round-Trip Truck Trip Frequency: January 1, 2020 through December 31, 2024
Source: Martin Marietta

As shown in the figure, the mean value of the curve (56 daily round-trip truck trips) encompasses 55 percent of the total sample cases, which means that almost half (45 percent) of the cases, would not be captured by this value, if it were to be used as a representative of the existing baseline condition. Thus, in order to select a value that includes more sample cases than the mean, a truck demand of 68 daily round-trip truck trips was selected. This value encompasses two-thirds of all the sample cases, and which represents an average arrival interval of nine minutes between trucks for the expected 10-hour period of facility operation. According to Martin Marietta, the same number of current employees (i.e., five) would continue to operate the facility under the existing baseline condition.

5. Project Reasonable Peak Condition

Given the variability in the volume of sand processed at the facility, a truck demand that represented the highest number of trucks that could reasonably be serviced daily under typical operating conditions, as explained by Martin Marietta, was estimated to represent the project reasonable peak conditions. These conditions include trucks being serviced (i.e., arriving, loading, cleaning, weighing, and exiting) at a five-minute minimum servicing duration during up to 20 hours per day by a maximum of six employees working at the facility (one additional employee than under existing baseline conditions). Under these constraints, the maximum number of daily trucks that can be serviced at the facility is 240 trucks.[8] As noted before, the maximum truck demand reported over the 2020-2024 5-year period was 203 daily round-trip truck trips on one day in March 2020. Under this condition, at peak demand times the additional employee would provide a second truck loading lane within the project site area during peak demand times, so that the minimum servicing duration between trucks reliably remains at five minutes or higher.

6. Project Maximum Condition

As noted above, the maximum truck throughput that would be permitted under the Air District permit for the proposed project would be 300 trucks per day, which, as described above, this condition would occur infrequently.

Assuming a 24-hour continuous facility operation under the current configuration (i.e., one service lane), the average arrival interval between trucks would be 4.8 minutes (i.e., 1,440 minutes per day divided by 300 trucks a day = 4.8 minutes per truck), which would be below the minimum time required for truck servicing (i.e., five minutes). Furthermore, this shorter interval would have to be sustained over the entire day in order to serve the 300-truck demand and avoid spillback onto Amador Street.

Martin Marietta has indicated that in order to serve such a peak of the peak demand, additional operating measures would be implemented at the facility, so that the minimum servicing duration between trucks remains at or above five minutes consistently throughout the day. These include, opening a second inbound truck lane within the site during peak demand periods (about 8 hours a day) so that two trucks could be loaded simultaneously, implementing a tight truck arrival schedule adherence, adding additional personnel to assist truck drivers and loaders inside the facility, and assigning flaggers in the vicinity of the project site truck driveways to direct and facilitate incoming and exiting truck maneuvers, manage any staging areas, and reduce the potential for queuing that extends beyond the project site; about four additional employees above current conditions (i.e., for a total of nine employees) would be required to implement these activities.

[8] One truck serviced every five minutes (twelve trucks service in one hour) over a 20-hour period results in 240 daily trucks.

All of these actions would become part of a Transportation Management Plan that would be prepared by Martin Marietta and implemented when truck demand is expected to rise above the project reasonable peak condition (i.e., when the number of daily round-trip truck trips exceeds 240).

7. PROJECT TRAVEL DEMAND SUMMARY

Table 2 on the next page provides a summary of the daily and peak hour travel demand for each analysis condition. The daily and peak hour vehicle trips are shown by vehicle type (i.e., trucks versus autos/vans) and by direction (inbound versus outbound).

Peak hour vehicle trips for the existing baseline, project reasonable peak, and project maximum peak conditions were estimated based on the existing peak hour proportion of daily truck traffic and the existing number of truck loading lanes. For existing counts and existing baseline conditions, the peak hour occurs within the 8:30 a.m. to 10:30 a.m. period. For project reasonable peak and project maximum conditions, because the maximum number of trucks processed per hour (i.e., 12 trucks per hour) is extended through most of the day (i.e., over 20 hours under the project reasonable peak conditions and over 24 hours under the project maximum conditions), the facility would operate at peak demand conditions throughout a substantial portion (at least eight hours) of the day. Additional information is included in Appendix B.

As shown in Table 2 on the next page, the number of total peak hour vehicle trips (i.e., one-way trips by trucks, autos, vans) would increase from 23 trips (13 inbound and 10 outbound) under the existing baseline condition, to 41 trips (21 inbound and 20 outbound) under the project reasonable peak condition, and to 44 trips (23 inbound and 21 outbound) under the project maximum condition.

Table 2
Pier 92 Modernization Project
Daily and Peak Hour Vehicle Trips (Inbound vs Outbound) for Existing Counts, Existing Baseline, Project Reasonable Peak, and Project Maximum Conditions

Analysis Condition	Daily Vehicle Trips [a]			Peak Hour Vehicle Trips [a],[b]		
	In bound	Out bound	Total	In bound	Out bound	Total
Existing Counts						
Trucks [c]	25	25	50	5	4	9
Autos/vans [d]	9	9	18	2	1	3
Total Existing Counts	34	34	68	7	5	12
Existing Baseline						
Trucks [c]	68	68	136	11	9	20
Autos/vans [d]	9	9	18	2	1	3
Total Existing Baseline	77	77	154	13	10	23
Project Reasonable Peak						
Trucks [c]	240	240	480	18	18	36
Autos/vans [e]	11	11	22	3	2	5
Total Project Reasonable Peak	251	251	502	21	20	41
Project Maximum						
Trucks [c]	300	300	600	19	19	38
Autos/vans [f]	17	17	34	4	2	6
Total Project Maximum	317	317	634	23	21	44

Source: Adavant Consulting/LCW Consulting, July 2025.
Notes:
a. One-way vehicle trips (i.e., not round-trips).
b. Existing project generated vehicle peak hour occurs between 9:15 a.m. and 10:15 a.m.
c. Includes only sand trucks; excludes water sprinkler tank trucks and road sweeper trucks which currently represent one daily round trip each.
d. Assumes five total employees per project description
e. Assumes six total employees (one additional loader) per project description; the total number of auto/van vehicle trips by employees and visitors was increased accordingly (i.e., by 20 percent).
f. Assumes four additional employees above current conditions, to account for two additional loaders and two flaggers; the total number of auto/van trips by employees and visitors was increased accordingly (i.e., by 80 percent).

8. TRUCK DISTANCES

The trip distances of the trucks traveling to and from the Pier 92 facility were calculated for the same analysis conditions as described above (i.e., existing counts, existing baseline, project reasonable peak, project maximum conditions). The calculations are presented in **Appendix C** and the steps to calculate the distances for each condition are as follows:

- **Step 1:** For each condition, the number of daily trucks were separated into two categories: trucks traveling to and from the two ready-mix concrete facilities on Amador Street at Pier 92 adjacent the project site, and trucks traveling to and from construction sites throughout the city and San Mateo County (e.g., construction sites that prepare concrete at the site, utility projects, sand replenishment at South Ocean Beach).[9] The current split of destinations of sand trucked out of the project site is about 65 percent to the ready-mix concrete facilities and 35 percent trips to sites throughout the city.[10] The amount of sand that can be accepted on a daily basis at the adjacent ready-mix concrete facilities maxes out at 3,000 tons per day, which is about 130 trucks per day traveling to and from the adjacent ready-mix concrete facilities.[11]

- **Step 2:** Information provided in the Pier 92 Modernization and Plant Replacement Project Application Summary[12] was used to estimate the distance for trucks traveling between the project site exit driveway and the sites throughout the city. The average distance for the trucks accessing the representative construction sites throughout the city is 4.53 miles one-way and 9.06 miles round-trip. Representative distances for the adjacent ready-mix concrete facilities was calculated between the project site exit driveway and the CEMEX main entrance driveway on Amador Street; 0.17 miles one-way and 0.34 miles round-trip.

- **Step 3:** For each condition a weighted average trip distance was calculated by first multiplying the trucks destined to and from the adjacent ready-mix concrete facilities versus delivery sites throughout the city by the respective round-trip lengths. The total distance was then divided by the total number of daily trucks to calculate the average trip distance.

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9 Pier 92 Modernization and Plant Replacement Project Application Summary, March 29, 2024, pp. 5 – 6.

10 Pier 92 Modernization and Plant Replacement Project Application Summary, March 29, 2024, p. 6.

11 Average sand payload on trucks leaving the site assumed to be 23 tons per truck per discussion with Michael Bishop, San Francisco Bay Area Marine Operations Manager for Martin Marietta, during pre-data collection meeting on April 18, 2025. The 130 trucks per day was calculated by dividing the maximum 3,000 tons of sand accepted per day at the adjacent facilities by 23 tons of sand per truck.

12 Pier 92 Modernization and Plant Replacement Project Application Summary, March 29, 2024, pp. 5 – 6.

Table 3 summarizes the resulting round-trip truck distances for the four analysis conditions. The round-trip truck distance for existing count and existing baseline conditions is 3.4 miles per trip. The distance increases under the project reasonable peak and project maximum conditions to 4.3 and 5.3 miles per round-trip, respectively. This increase is because under these conditions more trucks would travel to delivery sites throughout the city (i.e., 130 of the total daily trucks travel to the adjacent ready-mix concrete facilities, and the remainder travel further to construction sites throughout the city).

Table 3
Pier 92 Modernization Project
Summary of Truck Round-Trip Distances for Existing Counts, Existing Baseline, Project Reasonable Peak and Project Maximum Conditions

Analysis Condition	Average Truck Round-Trip Distance (miles)
Existing Counts	3.4
Existing Baseline	3.4
Project Reasonable Peak	4.3
Project Maximum	5.3

Source: Adavant Consulting/LCW Consulting, July 2025.
Note:
See Appendix C for truck distance calculations.

APPENDIX A
PIER 92 TRUCK TYPES

Pier 92 Modernization Project – Truck types

- Double bottom (max load ±26 Tn*)



- End up (30 ft long dump truck; max load ±26 Tn*)



- Super dump (max load ±21 Tn)



- 10-wheeler (max load ±15 Tn)



- Bob tail (max load < 10 Tn)



- Transfer super dump with trailer (max load ±22 Tn)



** Maximum gross vehicle weight limit in CA is 80,000 pounds; trucks staying on Amador St (to cement plants) are allowed to weigh up to 96,000 pounds.*

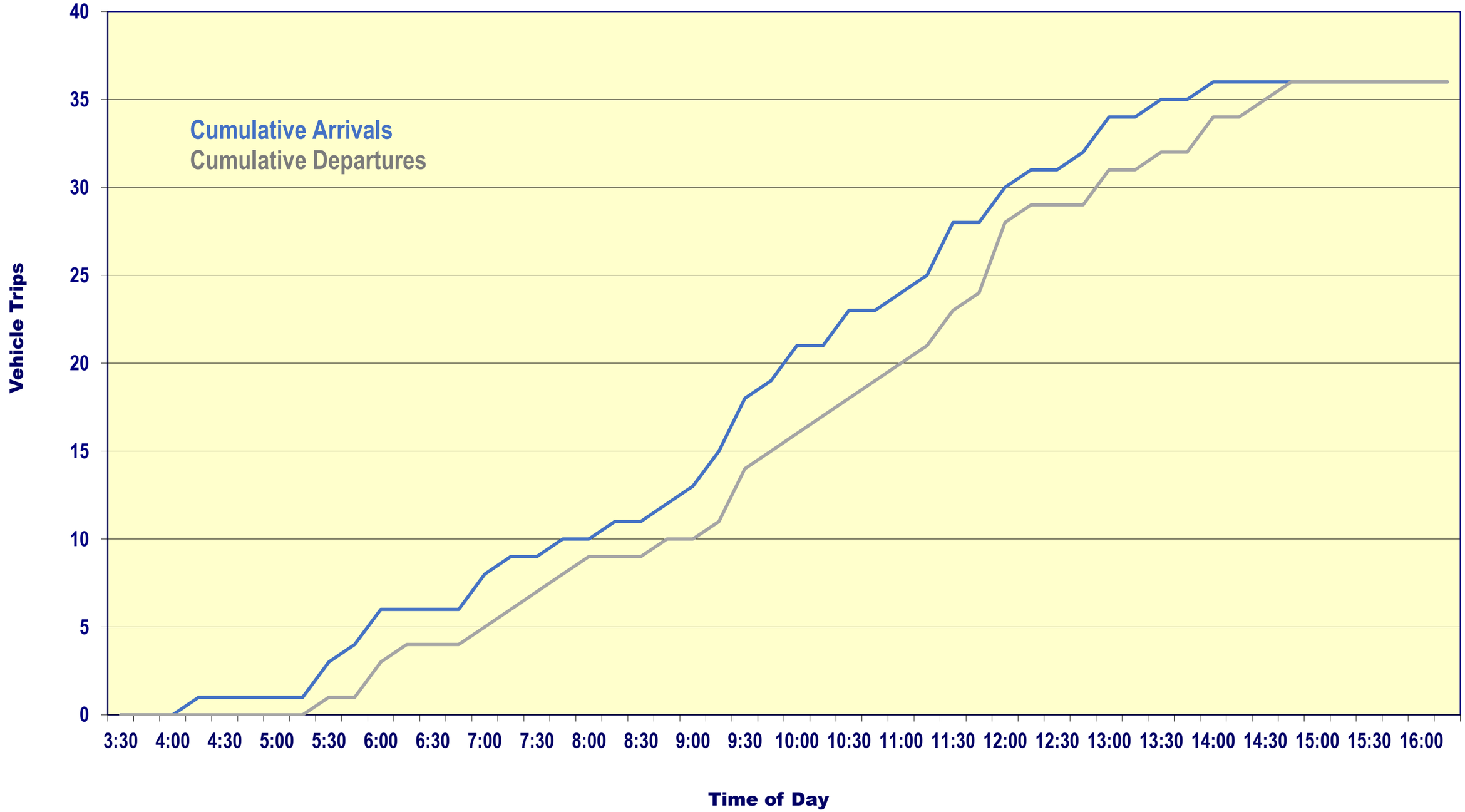
Overall average load per truck departing the plant: 23 to 24 Tn

APPENDIX B
PIER 92 TRUCK COUNTS

APRIL 2025 DAILY TRUCK COUNTS

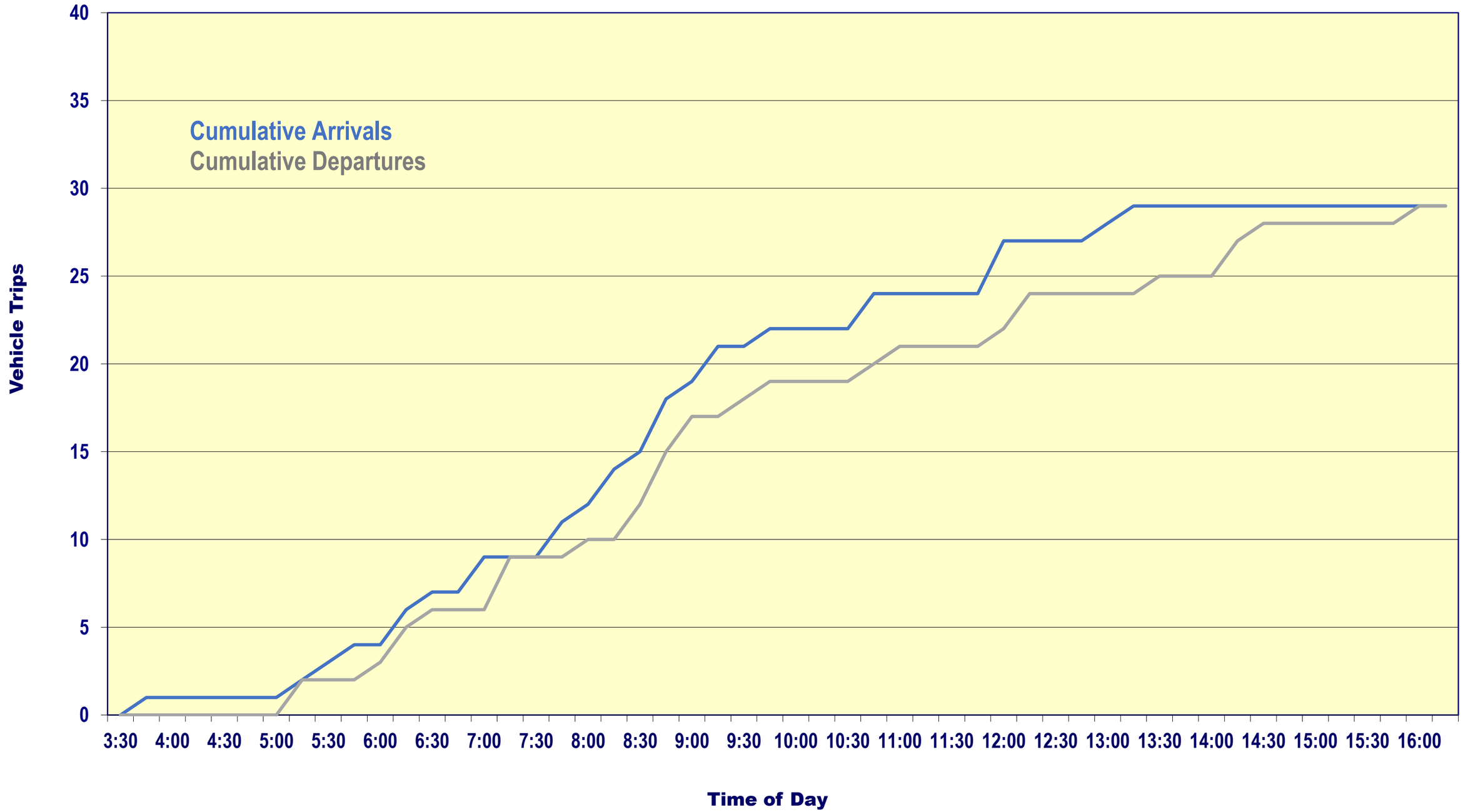
Pier 92 - Martin Marietta Marine Aggregates Plant

Daily Cumulative All Vehicle Trips: April 23, 2025



Pier 92 - Martin Marietta Marine Aggregates Plant

Daily Cumulative All Vehicle Trips: April 24, 2025



Pier 92 - Martin Marietta
Vehicles Entering the Plant
Wednesday, April 23, 2025
Entrance opened at 5:26 a.m., closed at 2:15 p.m.

	AGGREGATE PLANT																																	EMPLOYEE PARKING All Inbound Vehicles			TOTAL All Inbound Vehicles		
	Bob Tail			3-axle 10-wheel Single			5-axle 10-wheel Double			Super Dump			End Up			Double Bottom			Pick Up Truck			Water Truck			Street Sweeper			Total Inbound			From Amador			From Amador		
Start Time	From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			West	South	Total	West	South	Total
	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total						
Total:	-	1	1	3	-	3	1	1	2	12	2	14	3	-	3	1	-	1	-	1	1	-	1	1	1	-	1	21	6	27	6	3	9	27	9	36
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Pier 92 - Martin Marietta
Vehicles Exiting the Plant
Wednesday, April 23, 2025
Exit opened at 5:25 a.m., closed at 2:13 p.m.

	AGGREGATE PLANT																														EMPLOYEE PARKING			TOTAL		
	Bob Tail			3-axle 10-wheel Single			5-axle 10-wheel Double			Super Dump			End Up			Double Bottom			Pick Up Truck			Water Truck			Street Sweeper			Total Outbound			All Outbound Vehicles			All Outbound Vehicles		
Start	To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador		
Time	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total
Total:	1	-	1	3	-	3	2	-	2	14	-	14	3	-	3	1	-	1	-	1	1	1	-	1	-	1	1	25	2	27	6	3	9	31	5	36
3:30 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
3:45 AM	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
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Pier 92 - Martin Marietta
Vehicles Entering the Plant
Thursday, April 24, 2025
Entrance opened at 4:58 a.m., closed at 2:16 p.m.

	AGGREGATE PLANT																														EMPLOYEE PARKING All Inbound Vehicles			TOTAL All Inbound Vehicles		
	Bob Tail			3-axle 10-wheel Single			5-axle 10-wheel Double			Super Dump			End Up			Double Bottom			Pick Up Truck			Water Truck			Street Sweeper			Total Inbound								
Start Time	From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador			From Amador		
	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total
Total:	-	-	-	1	-	1	-	-	-	2	2	4	4	3	7	5	2	7	1	-	1	-	1	1	1	-	1	14	8	22	3	4	7	17	12	29
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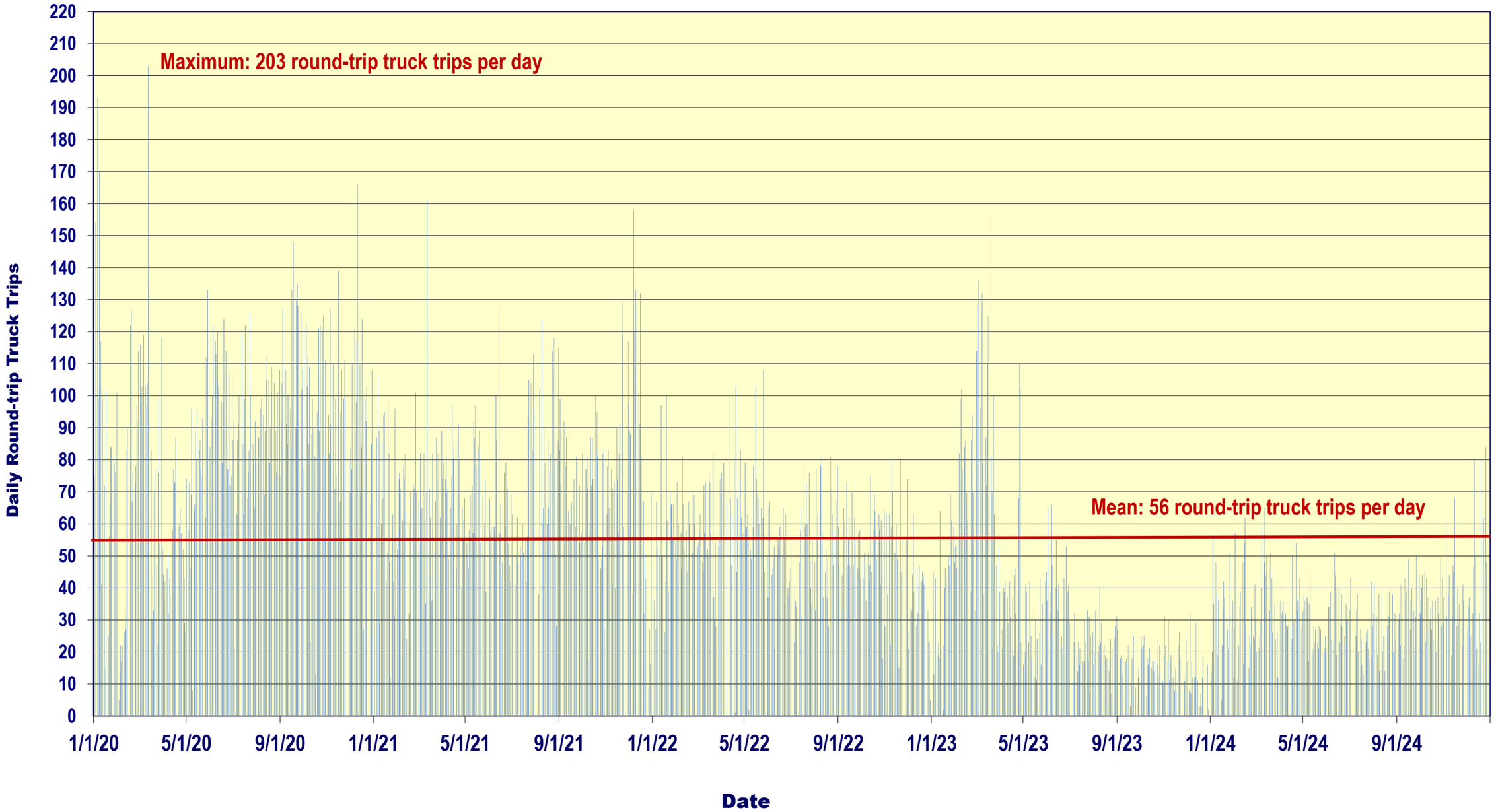
Pier 92 - Martin Marietta
Vehicles Exiting the Plant
Thursday, April 24, 2025
Exit opened at 5:00 a.m., closed at 2:15 p.m.

	AGGREGATE PLANT																															EMPLOYEE PARKING All Outbound Vehicles			TOTAL All Outbound Vehicles		
	Bob Tail			3-axle 10-wheel Single			5-axle 10-wheel Double			Super Dump			End Up			Double Bottom			Pick Up Truck			Water Truck			Street Sweeper			Total Outbound			To Amador			To Amador		
Start Time	To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			To Amador			West	South	Total	West	South	Total
	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total	West	South	Total						
Total:	-	-	-	1	-	1	-	-	-	4	-	4	7	-	7	7	-	7	-	1	1	1	-	1	-	1	1	20	2	22	4	3	7	24	5	29
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6:15 AM	-	-	-	-	-	-			-	-	-	-	1	-	1	-	-	-			-			-	-	-	-	1	-	1	1	pickup	1	2	-	2
6:30 AM	-	-	-	-	-	-			-	1	-	1	-	-	-	-	-	-			-			-	-	-	-	1	-	1			-	1	-	1
6:45 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
7:00 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
7:15 AM	-	-	-	-	-	-			-	-	-	-	2	-	2	-	-	-			-			-	-	1	1	2	1	3			-	2	1	3
7:30 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
7:45 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
8:00 AM	-	-	-	1	-	1			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	1	-	1			-	1	-	1
8:15 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
8:30 AM	-	-	-	-	-	-			-	-	-	-	1	-	1	1	-	1			-			-	-	-	-	2	-	2			-	2	-	2
8:45 AM	-	-	-	-	-	-			-	-	-	-	1	-	1	2	-	2			-			-	-	-	-	3	-	3			-	3	-	3
9:00 AM	-	-	-	-	-	-			-	-	-	-	1	-	1	1	-	1			-			-	-	-	-	2	-	2			-	2	-	2
9:15 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
9:30 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-	1	sweeper	1	1	-	1
9:45 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-		1 step van	1	-	1	1
10:00 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
10:15 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
10:30 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
10:45 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	1	-	1			-			-	-	-	-	1	-	1			-	1	-	1
11:00 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	1	-	1			-			-	-	-	-	1	-	1			-	1	-	1
11:15 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
11:30 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
11:45 AM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
12:00 PM	-	-	-	-	-	-			-	1	-	1	-	-	-	-	-	-			-			-	-	-	-	1	-	1			-	1	-	1
12:15 PM	-	-	-	-	-	-			-	1	-	1	-	-	-	1	-	1			-			-	-	-	-	2	-	2			-	2	-	2
12:30 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
12:45 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
1:00 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
1:15 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
1:30 PM	-	-	-	-	-	-			-	1	-	1	-	-	-	-	-	-			-			-	-	-	-	1	-	1			-	1	-	1
1:45 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
2:00 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
2:15 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-	1	car	1 pickup	2	1	1	2
2:30 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-		1 car	1	-	1	1
2:45 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
3:00 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
3:15 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
3:30 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
3:45 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-
4:00 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-	1	SUV	1	1	-	1
4:15 PM	-	-	-	-	-	-			-	-	-	-	-	-	-	-	-	-			-			-	-	-	-	-	-	-			-	-	-	-

JANUARY 1, 2020 THROUGH DECEMBER 31, 2024 TRUCK COUNTS

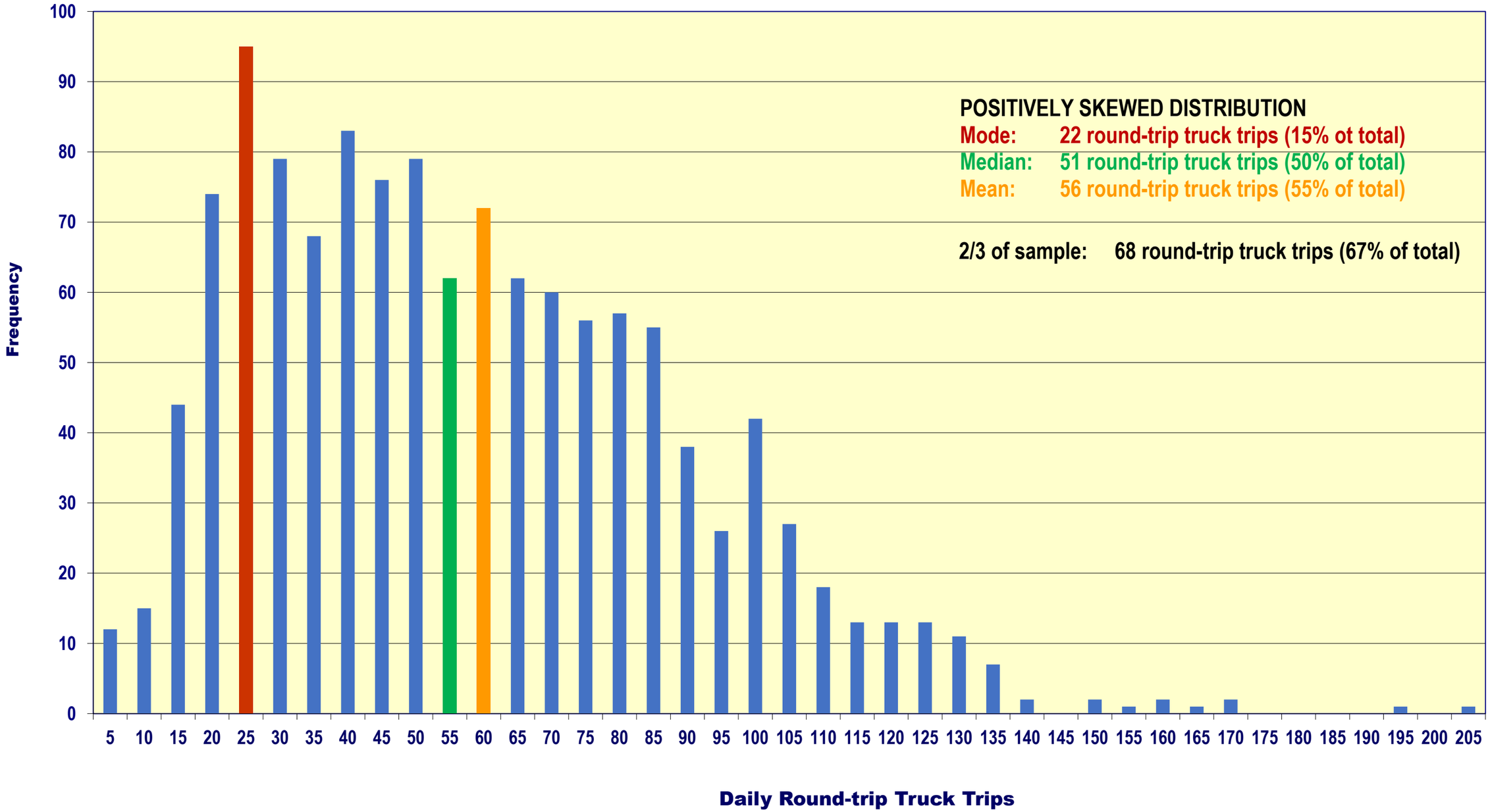
Pier 92 - Martin Marietta Marine Aggregates Plant

Daily Round-trip Truck Trips: January 1, 2020 through December 31, 2024



Pier 92 - Martin Marietta Marine Aggregates Plant

Daily Round-trip Truck Trip Frequency: January 1, 2020 through December 31, 2024



ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Total Round-trip Truck Trips: **70,954**

Wed, Jan/01/2020	-	January	2020	Wednesday
Thu, Jan/02/2020	75	January	2020	Thursday
Fri, Jan/03/2020	154	January	2020	Friday
Sat, Jan/04/2020	150	January	2020	Saturday
Sun, Jan/05/2020	-	January	2020	Sunday
Mon, Jan/06/2020	193	January	2020	Monday
Tue, Jan/07/2020	99	January	2020	Tuesday
Wed, Jan/08/2020	170	January	2020	Wednesday
Thu, Jan/09/2020	103	January	2020	Thursday
Fri, Jan/10/2020	117	January	2020	Friday
Sat, Jan/11/2020	41	January	2020	Saturday
Sun, Jan/12/2020	99	January	2020	Sunday
Mon, Jan/13/2020	-	January	2020	Monday
Tue, Jan/14/2020	73	January	2020	Tuesday
Wed, Jan/15/2020	72	January	2020	Wednesday
Thu, Jan/16/2020	15	January	2020	Thursday
Fri, Jan/17/2020	102	January	2020	Friday
Sat, Jan/18/2020	-	January	2020	Saturday
Sun, Jan/19/2020	-	January	2020	Sunday
Mon, Jan/20/2020	25	January	2020	Monday
Tue, Jan/21/2020	56	January	2020	Tuesday
Wed, Jan/22/2020	66	January	2020	Wednesday
Thu, Jan/23/2020	84	January	2020	Thursday
Fri, Jan/24/2020	84	January	2020	Friday
Sat, Jan/25/2020	-	January	2020	Saturday
Sun, Jan/26/2020	-	January	2020	Sunday
Mon, Jan/27/2020	81	January	2020	Monday
Tue, Jan/28/2020	79	January	2020	Tuesday
Wed, Jan/29/2020	76	January	2020	Wednesday
Thu, Jan/30/2020	71	January	2020	Thursday
Fri, Jan/31/2020	101	January	2020	Friday
Sat, Feb/01/2020	-	February	2020	Saturday
Sun, Feb/02/2020	-	February	2020	Sunday
Mon, Feb/03/2020	5	February	2020	Monday
Tue, Feb/04/2020	13	February	2020	Tuesday
Wed, Feb/05/2020	22	February	2020	Wednesday
Thu, Feb/06/2020	17	February	2020	Thursday
Fri, Feb/07/2020	22	February	2020	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Feb/08/2020	-	February	2020	Saturday
Sun, Feb/09/2020	-	February	2020	Sunday
Mon, Feb/10/2020	26	February	2020	Monday
Tue, Feb/11/2020	33	February	2020	Tuesday
Wed, Feb/12/2020	27	February	2020	Wednesday
Thu, Feb/13/2020	83	February	2020	Thursday
Fri, Feb/14/2020	90	February	2020	Friday
Sat, Feb/15/2020	-	February	2020	Saturday
Sun, Feb/16/2020	-	February	2020	Sunday
Mon, Feb/17/2020	-	February	2020	Monday
Tue, Feb/18/2020	122	February	2020	Tuesday
Wed, Feb/19/2020	127	February	2020	Wednesday
Thu, Feb/20/2020	67	February	2020	Thursday
Fri, Feb/21/2020	76	February	2020	Friday
Sat, Feb/22/2020	-	February	2020	Saturday
Sun, Feb/23/2020	-	February	2020	Sunday
Mon, Feb/24/2020	73	February	2020	Monday
Tue, Feb/25/2020	78	February	2020	Tuesday
Wed, Feb/26/2020	97	February	2020	Wednesday
Thu, Feb/27/2020	92	February	2020	Thursday
Fri, Feb/28/2020	114	February	2020	Friday
Sat, Feb/29/2020	-	February	2020	Saturday
Sun, Mar/01/2020	-	March	2020	Sunday
Mon, Mar/02/2020	116	March	2020	Monday
Tue, Mar/03/2020	100	March	2020	Tuesday
Wed, Mar/04/2020	103	March	2020	Wednesday
Thu, Mar/05/2020	90	March	2020	Thursday
Fri, Mar/06/2020	119	March	2020	Friday
Sat, Mar/07/2020	-	March	2020	Saturday
Sun, Mar/08/2020	-	March	2020	Sunday
Mon, Mar/09/2020	103	March	2020	Monday
Tue, Mar/10/2020	97	March	2020	Tuesday
Wed, Mar/11/2020	104	March	2020	Wednesday
Thu, Mar/12/2020	203	March	2020	Thursday
Fri, Mar/13/2020	135	March	2020	Friday
Sat, Mar/14/2020	-	March	2020	Saturday
Sun, Mar/15/2020	-	March	2020	Sunday
Mon, Mar/16/2020	83	March	2020	Monday
Tue, Mar/17/2020	30	March	2020	Tuesday
Wed, Mar/18/2020	44	March	2020	Wednesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Thu, Mar/19/2020	33	March	2020	Thursday
Fri, Mar/20/2020	70	March	2020	Friday
Sat, Mar/21/2020	77	March	2020	Saturday
Sun, Mar/22/2020	-	March	2020	Sunday
Mon, Mar/23/2020	47	March	2020	Monday
Tue, Mar/24/2020	22	March	2020	Tuesday
Wed, Mar/25/2020	76	March	2020	Wednesday
Thu, Mar/26/2020	99	March	2020	Thursday
Fri, Mar/27/2020	54	March	2020	Friday
Sat, Mar/28/2020	30	March	2020	Saturday
Sun, Mar/29/2020	-	March	2020	Sunday
Mon, Mar/30/2020	118	March	2020	Monday
Tue, Mar/31/2020	52	March	2020	Tuesday
Wed, Apr/01/2020	44	April	2020	Wednesday
Thu, Apr/02/2020	36	April	2020	Thursday
Fri, Apr/03/2020	42	April	2020	Friday
Sat, Apr/04/2020	-	April	2020	Saturday
Sun, Apr/05/2020	-	April	2020	Sunday
Mon, Apr/06/2020	46	April	2020	Monday
Tue, Apr/07/2020	51	April	2020	Tuesday
Wed, Apr/08/2020	32	April	2020	Wednesday
Thu, Apr/09/2020	43	April	2020	Thursday
Fri, Apr/10/2020	37	April	2020	Friday
Sat, Apr/11/2020	-	April	2020	Saturday
Sun, Apr/12/2020	-	April	2020	Sunday
Mon, Apr/13/2020	58	April	2020	Monday
Tue, Apr/14/2020	77	April	2020	Tuesday
Wed, Apr/15/2020	73	April	2020	Wednesday
Thu, Apr/16/2020	73	April	2020	Thursday
Fri, Apr/17/2020	87	April	2020	Friday
Sat, Apr/18/2020	-	April	2020	Saturday
Sun, Apr/19/2020	-	April	2020	Sunday
Mon, Apr/20/2020	50	April	2020	Monday
Tue, Apr/21/2020	59	April	2020	Tuesday
Wed, Apr/22/2020	60	April	2020	Wednesday
Thu, Apr/23/2020	65	April	2020	Thursday
Fri, Apr/24/2020	57	April	2020	Friday
Sat, Apr/25/2020	-	April	2020	Saturday
Sun, Apr/26/2020	-	April	2020	Sunday
Mon, Apr/27/2020	52	April	2020	Monday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Tue, Apr/28/2020	43	April	2020	Tuesday
Wed, Apr/29/2020	29	April	2020	Wednesday
Thu, Apr/30/2020	26	April	2020	Thursday
Fri, May/01/2020	74	May	2020	Friday
Sat, May/02/2020	-	May	2020	Saturday
Sun, May/03/2020	-	May	2020	Sunday
Mon, May/04/2020	58	May	2020	Monday
Tue, May/05/2020	73	May	2020	Tuesday
Wed, May/06/2020	46	May	2020	Wednesday
Thu, May/07/2020	69	May	2020	Thursday
Fri, May/08/2020	96	May	2020	Friday
Sat, May/09/2020	8	May	2020	Saturday
Sun, May/10/2020	-	May	2020	Sunday
Mon, May/11/2020	64	May	2020	Monday
Tue, May/12/2020	66	May	2020	Tuesday
Wed, May/13/2020	89	May	2020	Wednesday
Thu, May/14/2020	80	May	2020	Thursday
Fri, May/15/2020	96	May	2020	Friday
Sat, May/16/2020	-	May	2020	Saturday
Sun, May/17/2020	-	May	2020	Sunday
Mon, May/18/2020	83	May	2020	Monday
Tue, May/19/2020	86	May	2020	Tuesday
Wed, May/20/2020	77	May	2020	Wednesday
Thu, May/21/2020	75	May	2020	Thursday
Fri, May/22/2020	93	May	2020	Friday
Sat, May/23/2020	-	May	2020	Saturday
Sun, May/24/2020	-	May	2020	Sunday
Mon, May/25/2020	-	May	2020	Monday
Tue, May/26/2020	62	May	2020	Tuesday
Wed, May/27/2020	112	May	2020	Wednesday
Thu, May/28/2020	89	May	2020	Thursday
Fri, May/29/2020	133	May	2020	Friday
Sat, May/30/2020	-	May	2020	Saturday
Sun, May/31/2020	-	May	2020	Sunday
Mon, Jun/01/2020	84	June	2020	Monday
Tue, Jun/02/2020	64	June	2020	Tuesday
Wed, Jun/03/2020	93	June	2020	Wednesday
Thu, Jun/04/2020	100	June	2020	Thursday
Fri, Jun/05/2020	122	June	2020	Friday
Sat, Jun/06/2020	-	June	2020	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Jun/07/2020	-	June	2020	Sunday
Mon, Jun/08/2020	117	June	2020	Monday
Tue, Jun/09/2020	113	June	2020	Tuesday
Wed, Jun/10/2020	105	June	2020	Wednesday
Thu, Jun/11/2020	120	June	2020	Thursday
Fri, Jun/12/2020	103	June	2020	Friday
Sat, Jun/13/2020	-	June	2020	Saturday
Sun, Jun/14/2020	-	June	2020	Sunday
Mon, Jun/15/2020	79	June	2020	Monday
Tue, Jun/16/2020	98	June	2020	Tuesday
Wed, Jun/17/2020	79	June	2020	Wednesday
Thu, Jun/18/2020	98	June	2020	Thursday
Fri, Jun/19/2020	124	June	2020	Friday
Sat, Jun/20/2020	-	June	2020	Saturday
Sun, Jun/21/2020	-	June	2020	Sunday
Mon, Jun/22/2020	114	June	2020	Monday
Tue, Jun/23/2020	84	June	2020	Tuesday
Wed, Jun/24/2020	77	June	2020	Wednesday
Thu, Jun/25/2020	77	June	2020	Thursday
Fri, Jun/26/2020	107	June	2020	Friday
Sat, Jun/27/2020	72	June	2020	Saturday
Sun, Jun/28/2020	-	June	2020	Sunday
Mon, Jun/29/2020	75	June	2020	Monday
Tue, Jun/30/2020	107	June	2020	Tuesday
Wed, Jul/01/2020	86	July	2020	Wednesday
Thu, Jul/02/2020	92	July	2020	Thursday
Fri, Jul/03/2020	21	July	2020	Friday
Sat, Jul/04/2020	-	July	2020	Saturday
Sun, Jul/05/2020	-	July	2020	Sunday
Mon, Jul/06/2020	63	July	2020	Monday
Tue, Jul/07/2020	86	July	2020	Tuesday
Wed, Jul/08/2020	91	July	2020	Wednesday
Thu, Jul/09/2020	100	July	2020	Thursday
Fri, Jul/10/2020	101	July	2020	Friday
Sat, Jul/11/2020	-	July	2020	Saturday
Sun, Jul/12/2020	-	July	2020	Sunday
Mon, Jul/13/2020	119	July	2020	Monday
Tue, Jul/14/2020	85	July	2020	Tuesday
Wed, Jul/15/2020	63	July	2020	Wednesday
Thu, Jul/16/2020	99	July	2020	Thursday
Fri, Jul/17/2020	122	July	2020	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Jul/18/2020	-	July	2020	Saturday
Sun, Jul/19/2020	-	July	2020	Sunday
Mon, Jul/20/2020	68	July	2020	Monday
Tue, Jul/21/2020	76	July	2020	Tuesday
Wed, Jul/22/2020	83	July	2020	Wednesday
Thu, Jul/23/2020	126	July	2020	Thursday
Fri, Jul/24/2020	100	July	2020	Friday
Sat, Jul/25/2020	-	July	2020	Saturday
Sun, Jul/26/2020	-	July	2020	Sunday
Mon, Jul/27/2020	85	July	2020	Monday
Tue, Jul/28/2020	80	July	2020	Tuesday
Wed, Jul/29/2020	65	July	2020	Wednesday
Thu, Jul/30/2020	92	July	2020	Thursday
Fri, Jul/31/2020	79	July	2020	Friday
Sat, Aug/01/2020	-	August	2020	Saturday
Sun, Aug/02/2020	-	August	2020	Sunday
Mon, Aug/03/2020	87	August	2020	Monday
Tue, Aug/04/2020	87	August	2020	Tuesday
Wed, Aug/05/2020	75	August	2020	Wednesday
Thu, Aug/06/2020	96	August	2020	Thursday
Fri, Aug/07/2020	99	August	2020	Friday
Sat, Aug/08/2020	-	August	2020	Saturday
Sun, Aug/09/2020	-	August	2020	Sunday
Mon, Aug/10/2020	94	August	2020	Monday
Tue, Aug/11/2020	69	August	2020	Tuesday
Wed, Aug/12/2020	89	August	2020	Wednesday
Thu, Aug/13/2020	112	August	2020	Thursday
Fri, Aug/14/2020	105	August	2020	Friday
Sat, Aug/15/2020	-	August	2020	Saturday
Sun, Aug/16/2020	-	August	2020	Sunday
Mon, Aug/17/2020	105	August	2020	Monday
Tue, Aug/18/2020	79	August	2020	Tuesday
Wed, Aug/19/2020	90	August	2020	Wednesday
Thu, Aug/20/2020	101	August	2020	Thursday
Fri, Aug/21/2020	109	August	2020	Friday
Sat, Aug/22/2020	-	August	2020	Saturday
Sun, Aug/23/2020	-	August	2020	Sunday
Mon, Aug/24/2020	104	August	2020	Monday
Tue, Aug/25/2020	74	August	2020	Tuesday
Wed, Aug/26/2020	89	August	2020	Wednesday
Thu, Aug/27/2020	76	August	2020	Thursday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Fri, Aug/28/2020	101	August	2020	Friday
Sat, Aug/29/2020	-	August	2020	Saturday
Sun, Aug/30/2020	-	August	2020	Sunday
Mon, Aug/31/2020	108	August	2020	Monday
Tue, Sep/01/2020	75	September	2020	Tuesday
Wed, Sep/02/2020	92	September	2020	Wednesday
Thu, Sep/03/2020	104	September	2020	Thursday
Fri, Sep/04/2020	127	September	2020	Friday
Sat, Sep/05/2020	-	September	2020	Saturday
Sun, Sep/06/2020	-	September	2020	Sunday
Mon, Sep/07/2020	-	September	2020	Monday
Tue, Sep/08/2020	108	September	2020	Tuesday
Wed, Sep/09/2020	91	September	2020	Wednesday
Thu, Sep/10/2020	85	September	2020	Thursday
Fri, Sep/11/2020	100	September	2020	Friday
Sat, Sep/12/2020	-	September	2020	Saturday
Sun, Sep/13/2020	-	September	2020	Sunday
Mon, Sep/14/2020	96	September	2020	Monday
Tue, Sep/15/2020	84	September	2020	Tuesday
Wed, Sep/16/2020	133	September	2020	Wednesday
Thu, Sep/17/2020	99	September	2020	Thursday
Fri, Sep/18/2020	148	September	2020	Friday
Sat, Sep/19/2020	-	September	2020	Saturday
Sun, Sep/20/2020	-	September	2020	Sunday
Mon, Sep/21/2020	90	September	2020	Monday
Tue, Sep/22/2020	130	September	2020	Tuesday
Wed, Sep/23/2020	135	September	2020	Wednesday
Thu, Sep/24/2020	128	September	2020	Thursday
Fri, Sep/25/2020	93	September	2020	Friday
Sat, Sep/26/2020	-	September	2020	Saturday
Sun, Sep/27/2020	-	September	2020	Sunday
Mon, Sep/28/2020	126	September	2020	Monday
Tue, Sep/29/2020	102	September	2020	Tuesday
Wed, Sep/30/2020	108	September	2020	Wednesday
Thu, Oct/01/2020	77	October	2020	Thursday
Fri, Oct/02/2020	121	October	2020	Friday
Sat, Oct/03/2020	-	October	2020	Saturday
Sun, Oct/04/2020	-	October	2020	Sunday
Mon, Oct/05/2020	123	October	2020	Monday
Tue, Oct/06/2020	103	October	2020	Tuesday
Wed, Oct/07/2020	112	October	2020	Wednesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Thu, Oct/08/2020	85	October	2020	Thursday
Fri, Oct/09/2020	109	October	2020	Friday
Sat, Oct/10/2020	23	October	2020	Saturday
Sun, Oct/11/2020	-	October	2020	Sunday
Mon, Oct/12/2020	88	October	2020	Monday
Tue, Oct/13/2020	99	October	2020	Tuesday
Wed, Oct/14/2020	90	October	2020	Wednesday
Thu, Oct/15/2020	95	October	2020	Thursday
Fri, Oct/16/2020	81	October	2020	Friday
Sat, Oct/17/2020	13	October	2020	Saturday
Sun, Oct/18/2020	-	October	2020	Sunday
Mon, Oct/19/2020	95	October	2020	Monday
Tue, Oct/20/2020	64	October	2020	Tuesday
Wed, Oct/21/2020	121	October	2020	Wednesday
Thu, Oct/22/2020	89	October	2020	Thursday
Fri, Oct/23/2020	122	October	2020	Friday
Sat, Oct/24/2020	-	October	2020	Saturday
Sun, Oct/25/2020	-	October	2020	Sunday
Mon, Oct/26/2020	120	October	2020	Monday
Tue, Oct/27/2020	125	October	2020	Tuesday
Wed, Oct/28/2020	82	October	2020	Wednesday
Thu, Oct/29/2020	80	October	2020	Thursday
Fri, Oct/30/2020	111	October	2020	Friday
Sat, Oct/31/2020	-	October	2020	Saturday
Sun, Nov/01/2020	-	November	2020	Sunday
Mon, Nov/02/2020	55	November	2020	Monday
Tue, Nov/03/2020	94	November	2020	Tuesday
Wed, Nov/04/2020	82	November	2020	Wednesday
Thu, Nov/05/2020	127	November	2020	Thursday
Fri, Nov/06/2020	91	November	2020	Friday
Sat, Nov/07/2020	-	November	2020	Saturday
Sun, Nov/08/2020	-	November	2020	Sunday
Mon, Nov/09/2020	110	November	2020	Monday
Tue, Nov/10/2020	96	November	2020	Tuesday
Wed, Nov/11/2020	71	November	2020	Wednesday
Thu, Nov/12/2020	99	November	2020	Thursday
Fri, Nov/13/2020	75	November	2020	Friday
Sat, Nov/14/2020	-	November	2020	Saturday
Sun, Nov/15/2020	-	November	2020	Sunday
Mon, Nov/16/2020	139	November	2020	Monday
Tue, Nov/17/2020	65	November	2020	Tuesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Wed, Nov/18/2020	67	November	2020	Wednesday
Thu, Nov/19/2020	95	November	2020	Thursday
Fri, Nov/20/2020	108	November	2020	Friday
Sat, Nov/21/2020	-	November	2020	Saturday
Sun, Nov/22/2020	-	November	2020	Sunday
Mon, Nov/23/2020	99	November	2020	Monday
Tue, Nov/24/2020	111	November	2020	Tuesday
Wed, Nov/25/2020	99	November	2020	Wednesday
Thu, Nov/26/2020	-	November	2020	Thursday
Fri, Nov/27/2020	-	November	2020	Friday
Sat, Nov/28/2020	-	November	2020	Saturday
Sun, Nov/29/2020	-	November	2020	Sunday
Mon, Nov/30/2020	80	November	2020	Monday
Tue, Dec/01/2020	70	December	2020	Tuesday
Wed, Dec/02/2020	84	December	2020	Wednesday
Thu, Dec/03/2020	77	December	2020	Thursday
Fri, Dec/04/2020	110	December	2020	Friday
Sat, Dec/05/2020	-	December	2020	Saturday
Sun, Dec/06/2020	-	December	2020	Sunday
Mon, Dec/07/2020	121	December	2020	Monday
Tue, Dec/08/2020	89	December	2020	Tuesday
Wed, Dec/09/2020	98	December	2020	Wednesday
Thu, Dec/10/2020	117	December	2020	Thursday
Fri, Dec/11/2020	166	December	2020	Friday
Sat, Dec/12/2020	-	December	2020	Saturday
Sun, Dec/13/2020	-	December	2020	Sunday
Mon, Dec/14/2020	110	December	2020	Monday
Tue, Dec/15/2020	70	December	2020	Tuesday
Wed, Dec/16/2020	84	December	2020	Wednesday
Thu, Dec/17/2020	124	December	2020	Thursday
Fri, Dec/18/2020	100	December	2020	Friday
Sat, Dec/19/2020	27	December	2020	Saturday
Sun, Dec/20/2020	-	December	2020	Sunday
Mon, Dec/21/2020	99	December	2020	Monday
Tue, Dec/22/2020	92	December	2020	Tuesday
Wed, Dec/23/2020	103	December	2020	Wednesday
Thu, Dec/24/2020	-	December	2020	Thursday
Fri, Dec/25/2020	-	December	2020	Friday
Sat, Dec/26/2020	-	December	2020	Saturday
Sun, Dec/27/2020	-	December	2020	Sunday
Mon, Dec/28/2020	66	December	2020	Monday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Tue, Dec/29/2020	85	December	2020	Tuesday
Wed, Dec/30/2020	108	December	2020	Wednesday
Thu, Dec/31/2020	25	December	2020	Thursday
Fri, Jan/01/2021	-	January	2021	Friday
Sat, Jan/02/2021	39	January	2021	Saturday
Sun, Jan/03/2021	-	January	2021	Sunday
Mon, Jan/04/2021	46	January	2021	Monday
Tue, Jan/05/2021	87	January	2021	Tuesday
Wed, Jan/06/2021	59	January	2021	Wednesday
Thu, Jan/07/2021	106	January	2021	Thursday
Fri, Jan/08/2021	89	January	2021	Friday
Sat, Jan/09/2021	29	January	2021	Saturday
Sun, Jan/10/2021	-	January	2021	Sunday
Mon, Jan/11/2021	60	January	2021	Monday
Tue, Jan/12/2021	85	January	2021	Tuesday
Wed, Jan/13/2021	68	January	2021	Wednesday
Thu, Jan/14/2021	94	January	2021	Thursday
Fri, Jan/15/2021	95	January	2021	Friday
Sat, Jan/16/2021	-	January	2021	Saturday
Sun, Jan/17/2021	-	January	2021	Sunday
Mon, Jan/18/2021	42	January	2021	Monday
Tue, Jan/19/2021	51	January	2021	Tuesday
Wed, Jan/20/2021	99	January	2021	Wednesday
Thu, Jan/21/2021	82	January	2021	Thursday
Fri, Jan/22/2021	48	January	2021	Friday
Sat, Jan/23/2021	12	January	2021	Saturday
Sun, Jan/24/2021	-	January	2021	Sunday
Mon, Jan/25/2021	50	January	2021	Monday
Tue, Jan/26/2021	63	January	2021	Tuesday
Wed, Jan/27/2021	42	January	2021	Wednesday
Thu, Jan/28/2021	31	January	2021	Thursday
Fri, Jan/29/2021	96	January	2021	Friday
Sat, Jan/30/2021	-	January	2021	Saturday
Sun, Jan/31/2021	-	January	2021	Sunday
Mon, Feb/01/2021	52	February	2021	Monday
Tue, Feb/02/2021	57	February	2021	Tuesday
Wed, Feb/03/2021	74	February	2021	Wednesday
Thu, Feb/04/2021	76	February	2021	Thursday
Fri, Feb/05/2021	71	February	2021	Friday
Sat, Feb/06/2021	-	February	2021	Saturday
Sun, Feb/07/2021	-	February	2021	Sunday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Mon, Feb/08/2021	61	February	2021	Monday
Tue, Feb/09/2021	78	February	2021	Tuesday
Wed, Feb/10/2021	74	February	2021	Wednesday
Thu, Feb/11/2021	82	February	2021	Thursday
Fri, Feb/12/2021	64	February	2021	Friday
Sat, Feb/13/2021	24	February	2021	Saturday
Sun, Feb/14/2021	-	February	2021	Sunday
Mon, Feb/15/2021	-	February	2021	Monday
Tue, Feb/16/2021	32	February	2021	Tuesday
Wed, Feb/17/2021	60	February	2021	Wednesday
Thu, Feb/18/2021	70	February	2021	Thursday
Fri, Feb/19/2021	68	February	2021	Friday
Sat, Feb/20/2021	-	February	2021	Saturday
Sun, Feb/21/2021	-	February	2021	Sunday
Mon, Feb/22/2021	72	February	2021	Monday
Tue, Feb/23/2021	71	February	2021	Tuesday
Wed, Feb/24/2021	71	February	2021	Wednesday
Thu, Feb/25/2021	101	February	2021	Thursday
Fri, Feb/26/2021	70	February	2021	Friday
Sat, Feb/27/2021	-	February	2021	Saturday
Sun, Feb/28/2021	-	February	2021	Sunday
Mon, Mar/01/2021	67	March	2021	Monday
Tue, Mar/02/2021	53	March	2021	Tuesday
Wed, Mar/03/2021	82	March	2021	Wednesday
Thu, Mar/04/2021	64	March	2021	Thursday
Fri, Mar/05/2021	65	March	2021	Friday
Sat, Mar/06/2021	-	March	2021	Saturday
Sun, Mar/07/2021	-	March	2021	Sunday
Mon, Mar/08/2021	82	March	2021	Monday
Tue, Mar/09/2021	61	March	2021	Tuesday
Wed, Mar/10/2021	35	March	2021	Wednesday
Thu, Mar/11/2021	70	March	2021	Thursday
Fri, Mar/12/2021	161	March	2021	Friday
Sat, Mar/13/2021	-	March	2021	Saturday
Sun, Mar/14/2021	-	March	2021	Sunday
Mon, Mar/15/2021	71	March	2021	Monday
Tue, Mar/16/2021	62	March	2021	Tuesday
Wed, Mar/17/2021	43	March	2021	Wednesday
Thu, Mar/18/2021	36	March	2021	Thursday
Fri, Mar/19/2021	82	March	2021	Friday
Sat, Mar/20/2021	-	March	2021	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Mar/21/2021	-	March	2021	Sunday
Mon, Mar/22/2021	51	March	2021	Monday
Tue, Mar/23/2021	67	March	2021	Tuesday
Wed, Mar/24/2021	87	March	2021	Wednesday
Thu, Mar/25/2021	73	March	2021	Thursday
Fri, Mar/26/2021	82	March	2021	Friday
Sat, Mar/27/2021	-	March	2021	Saturday
Sun, Mar/28/2021	-	March	2021	Sunday
Mon, Mar/29/2021	62	March	2021	Monday
Tue, Mar/30/2021	55	March	2021	Tuesday
Wed, Mar/31/2021	89	March	2021	Wednesday
Thu, Apr/01/2021	74	April	2021	Thursday
Fri, Apr/02/2021	79	April	2021	Friday
Sat, Apr/03/2021	-	April	2021	Saturday
Sun, Apr/04/2021	-	April	2021	Sunday
Mon, Apr/05/2021	74	April	2021	Monday
Tue, Apr/06/2021	81	April	2021	Tuesday
Wed, Apr/07/2021	70	April	2021	Wednesday
Thu, Apr/08/2021	71	April	2021	Thursday
Fri, Apr/09/2021	49	April	2021	Friday
Sat, Apr/10/2021	-	April	2021	Saturday
Sun, Apr/11/2021	-	April	2021	Sunday
Mon, Apr/12/2021	65	April	2021	Monday
Tue, Apr/13/2021	75	April	2021	Tuesday
Wed, Apr/14/2021	97	April	2021	Wednesday
Thu, Apr/15/2021	80	April	2021	Thursday
Fri, Apr/16/2021	84	April	2021	Friday
Sat, Apr/17/2021	-	April	2021	Saturday
Sun, Apr/18/2021	-	April	2021	Sunday
Mon, Apr/19/2021	46	April	2021	Monday
Tue, Apr/20/2021	60	April	2021	Tuesday
Wed, Apr/21/2021	85	April	2021	Wednesday
Thu, Apr/22/2021	91	April	2021	Thursday
Fri, Apr/23/2021	80	April	2021	Friday
Sat, Apr/24/2021	-	April	2021	Saturday
Sun, Apr/25/2021	-	April	2021	Sunday
Mon, Apr/26/2021	40	April	2021	Monday
Tue, Apr/27/2021	65	April	2021	Tuesday
Wed, Apr/28/2021	55	April	2021	Wednesday
Thu, Apr/29/2021	61	April	2021	Thursday
Fri, Apr/30/2021	68	April	2021	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, May/01/2021	-	May	2021	Saturday
Sun, May/02/2021	-	May	2021	Sunday
Mon, May/03/2021	54	May	2021	Monday
Tue, May/04/2021	51	May	2021	Tuesday
Wed, May/05/2021	46	May	2021	Wednesday
Thu, May/06/2021	58	May	2021	Thursday
Fri, May/07/2021	72	May	2021	Friday
Sat, May/08/2021	69	May	2021	Saturday
Sun, May/09/2021	-	May	2021	Sunday
Mon, May/10/2021	72	May	2021	Monday
Tue, May/11/2021	57	May	2021	Tuesday
Wed, May/12/2021	92	May	2021	Wednesday
Thu, May/13/2021	87	May	2021	Thursday
Fri, May/14/2021	97	May	2021	Friday
Sat, May/15/2021	78	May	2021	Saturday
Sun, May/16/2021	-	May	2021	Sunday
Mon, May/17/2021	68	May	2021	Monday
Tue, May/18/2021	84	May	2021	Tuesday
Wed, May/19/2021	89	May	2021	Wednesday
Thu, May/20/2021	82	May	2021	Thursday
Fri, May/21/2021	54	May	2021	Friday
Sat, May/22/2021	-	May	2021	Saturday
Sun, May/23/2021	-	May	2021	Sunday
Mon, May/24/2021	69	May	2021	Monday
Tue, May/25/2021	50	May	2021	Tuesday
Wed, May/26/2021	60	May	2021	Wednesday
Thu, May/27/2021	74	May	2021	Thursday
Fri, May/28/2021	39	May	2021	Friday
Sat, May/29/2021	-	May	2021	Saturday
Sun, May/30/2021	-	May	2021	Sunday
Mon, May/31/2021	-	May	2021	Monday
Tue, Jun/01/2021	67	June	2021	Tuesday
Wed, Jun/02/2021	68	June	2021	Wednesday
Thu, Jun/03/2021	57	June	2021	Thursday
Fri, Jun/04/2021	59	June	2021	Friday
Sat, Jun/05/2021	-	June	2021	Saturday
Sun, Jun/06/2021	-	June	2021	Sunday
Mon, Jun/07/2021	59	June	2021	Monday
Tue, Jun/08/2021	59	June	2021	Tuesday
Wed, Jun/09/2021	55	June	2021	Wednesday
Thu, Jun/10/2021	100	June	2021	Thursday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Fri, Jun/11/2021	86	June	2021	Friday
Sat, Jun/12/2021	-	June	2021	Saturday
Sun, Jun/13/2021	-	June	2021	Sunday
Mon, Jun/14/2021	128	June	2021	Monday
Tue, Jun/15/2021	57	June	2021	Tuesday
Wed, Jun/16/2021	66	June	2021	Wednesday
Thu, Jun/17/2021	43	June	2021	Thursday
Fri, Jun/18/2021	48	June	2021	Friday
Sat, Jun/19/2021	-	June	2021	Saturday
Sun, Jun/20/2021	-	June	2021	Sunday
Mon, Jun/21/2021	76	June	2021	Monday
Tue, Jun/22/2021	59	June	2021	Tuesday
Wed, Jun/23/2021	79	June	2021	Wednesday
Thu, Jun/24/2021	-	June	2021	Thursday
Fri, Jun/25/2021	71	June	2021	Friday
Sat, Jun/26/2021	54	June	2021	Saturday
Sun, Jun/27/2021	-	June	2021	Sunday
Mon, Jun/28/2021	47	June	2021	Monday
Tue, Jun/29/2021	42	June	2021	Tuesday
Wed, Jun/30/2021	69	June	2021	Wednesday
Thu, Jul/01/2021	63	July	2021	Thursday
Fri, Jul/02/2021	50	July	2021	Friday
Sat, Jul/03/2021	-	July	2021	Saturday
Sun, Jul/04/2021	-	July	2021	Sunday
Mon, Jul/05/2021	-	July	2021	Monday
Tue, Jul/06/2021	41	July	2021	Tuesday
Wed, Jul/07/2021	50	July	2021	Wednesday
Thu, Jul/08/2021	62	July	2021	Thursday
Fri, Jul/09/2021	48	July	2021	Friday
Sat, Jul/10/2021	-	July	2021	Saturday
Sun, Jul/11/2021	-	July	2021	Sunday
Mon, Jul/12/2021	53	July	2021	Monday
Tue, Jul/13/2021	50	July	2021	Tuesday
Wed, Jul/14/2021	51	July	2021	Wednesday
Thu, Jul/15/2021	60	July	2021	Thursday
Fri, Jul/16/2021	51	July	2021	Friday
Sat, Jul/17/2021	-	July	2021	Saturday
Sun, Jul/18/2021	-	July	2021	Sunday
Mon, Jul/19/2021	55	July	2021	Monday
Tue, Jul/20/2021	42	July	2021	Tuesday
Wed, Jul/21/2021	56	July	2021	Wednesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Thu, Jul/22/2021	93	July	2021	Thursday
Fri, Jul/23/2021	105	July	2021	Friday
Sat, Jul/24/2021	-	July	2021	Saturday
Sun, Jul/25/2021	-	July	2021	Sunday
Mon, Jul/26/2021	104	July	2021	Monday
Tue, Jul/27/2021	90	July	2021	Tuesday
Wed, Jul/28/2021	83	July	2021	Wednesday
Thu, Jul/29/2021	113	July	2021	Thursday
Fri, Jul/30/2021	96	July	2021	Friday
Sat, Jul/31/2021	-	July	2021	Saturday
Sun, Aug/01/2021	-	August	2021	Sunday
Mon, Aug/02/2021	-	August	2021	Monday
Tue, Aug/03/2021	-	August	2021	Tuesday
Wed, Aug/04/2021	-	August	2021	Wednesday
Thu, Aug/05/2021	38	August	2021	Thursday
Fri, Aug/06/2021	102	August	2021	Friday
Sat, Aug/07/2021	-	August	2021	Saturday
Sun, Aug/08/2021	-	August	2021	Sunday
Mon, Aug/09/2021	124	August	2021	Monday
Tue, Aug/10/2021	60	August	2021	Tuesday
Wed, Aug/11/2021	65	August	2021	Wednesday
Thu, Aug/12/2021	90	August	2021	Thursday
Fri, Aug/13/2021	79	August	2021	Friday
Sat, Aug/14/2021	-	August	2021	Saturday
Sun, Aug/15/2021	-	August	2021	Sunday
Mon, Aug/16/2021	60	August	2021	Monday
Tue, Aug/17/2021	86	August	2021	Tuesday
Wed, Aug/18/2021	65	August	2021	Wednesday
Thu, Aug/19/2021	77	August	2021	Thursday
Fri, Aug/20/2021	82	August	2021	Friday
Sat, Aug/21/2021	-	August	2021	Saturday
Sun, Aug/22/2021	-	August	2021	Sunday
Mon, Aug/23/2021	114	August	2021	Monday
Tue, Aug/24/2021	108	August	2021	Tuesday
Wed, Aug/25/2021	118	August	2021	Wednesday
Thu, Aug/26/2021	80	August	2021	Thursday
Fri, Aug/27/2021	50	August	2021	Friday
Sat, Aug/28/2021	28	August	2021	Saturday
Sun, Aug/29/2021	-	August	2021	Sunday
Mon, Aug/30/2021	86	August	2021	Monday
Tue, Aug/31/2021	115	August	2021	Tuesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Wed, Sep/01/2021	83	September	2021	Wednesday
Thu, Sep/02/2021	99	September	2021	Thursday
Fri, Sep/03/2021	72	September	2021	Friday
Sat, Sep/04/2021	-	September	2021	Saturday
Sun, Sep/05/2021	-	September	2021	Sunday
Mon, Sep/06/2021	-	September	2021	Monday
Tue, Sep/07/2021	92	September	2021	Tuesday
Wed, Sep/08/2021	54	September	2021	Wednesday
Thu, Sep/09/2021	78	September	2021	Thursday
Fri, Sep/10/2021	87	September	2021	Friday
Sat, Sep/11/2021	-	September	2021	Saturday
Sun, Sep/12/2021	-	September	2021	Sunday
Mon, Sep/13/2021	64	September	2021	Monday
Tue, Sep/14/2021	-	September	2021	Tuesday
Wed, Sep/15/2021	60	September	2021	Wednesday
Thu, Sep/16/2021	66	September	2021	Thursday
Fri, Sep/17/2021	67	September	2021	Friday
Sat, Sep/18/2021	-	September	2021	Saturday
Sun, Sep/19/2021	-	September	2021	Sunday
Mon, Sep/20/2021	74	September	2021	Monday
Tue, Sep/21/2021	55	September	2021	Tuesday
Wed, Sep/22/2021	59	September	2021	Wednesday
Thu, Sep/23/2021	81	September	2021	Thursday
Fri, Sep/24/2021	79	September	2021	Friday
Sat, Sep/25/2021	-	September	2021	Saturday
Sun, Sep/26/2021	-	September	2021	Sunday
Mon, Sep/27/2021	72	September	2021	Monday
Tue, Sep/28/2021	54	September	2021	Tuesday
Wed, Sep/29/2021	57	September	2021	Wednesday
Thu, Sep/30/2021	57	September	2021	Thursday
Fri, Oct/01/2021	82	October	2021	Friday
Sat, Oct/02/2021	-	October	2021	Saturday
Sun, Oct/03/2021	-	October	2021	Sunday
Mon, Oct/04/2021	54	October	2021	Monday
Tue, Oct/05/2021	77	October	2021	Tuesday
Wed, Oct/06/2021	77	October	2021	Wednesday
Thu, Oct/07/2021	81	October	2021	Thursday
Fri, Oct/08/2021	71	October	2021	Friday
Sat, Oct/09/2021	17	October	2021	Saturday
Sun, Oct/10/2021	-	October	2021	Sunday
Mon, Oct/11/2021	60	October	2021	Monday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Tue, Oct/12/2021	87	October	2021	Tuesday
Wed, Oct/13/2021	72	October	2021	Wednesday
Thu, Oct/14/2021	87	October	2021	Thursday
Fri, Oct/15/2021	74	October	2021	Friday
Sat, Oct/16/2021	-	October	2021	Saturday
Sun, Oct/17/2021	-	October	2021	Sunday
Mon, Oct/18/2021	100	October	2021	Monday
Tue, Oct/19/2021	83	October	2021	Tuesday
Wed, Oct/20/2021	95	October	2021	Wednesday
Thu, Oct/21/2021	81	October	2021	Thursday
Fri, Oct/22/2021	49	October	2021	Friday
Sat, Oct/23/2021	-	October	2021	Saturday
Sun, Oct/24/2021	-	October	2021	Sunday
Mon, Oct/25/2021	46	October	2021	Monday
Tue, Oct/26/2021	49	October	2021	Tuesday
Wed, Oct/27/2021	53	October	2021	Wednesday
Thu, Oct/28/2021	82	October	2021	Thursday
Fri, Oct/29/2021	83	October	2021	Friday
Sat, Oct/30/2021	27	October	2021	Saturday
Sun, Oct/31/2021	-	October	2021	Sunday
Mon, Nov/01/2021	46	November	2021	Monday
Tue, Nov/02/2021	63	November	2021	Tuesday
Wed, Nov/03/2021	78	November	2021	Wednesday
Thu, Nov/04/2021	83	November	2021	Thursday
Fri, Nov/05/2021	65	November	2021	Friday
Sat, Nov/06/2021	-	November	2021	Saturday
Sun, Nov/07/2021	-	November	2021	Sunday
Mon, Nov/08/2021	77	November	2021	Monday
Tue, Nov/09/2021	41	November	2021	Tuesday
Wed, Nov/10/2021	71	November	2021	Wednesday
Thu, Nov/11/2021	57	November	2021	Thursday
Fri, Nov/12/2021	73	November	2021	Friday
Sat, Nov/13/2021	40	November	2021	Saturday
Sun, Nov/14/2021	-	November	2021	Sunday
Mon, Nov/15/2021	90	November	2021	Monday
Tue, Nov/16/2021	74	November	2021	Tuesday
Wed, Nov/17/2021	57	November	2021	Wednesday
Thu, Nov/18/2021	82	November	2021	Thursday
Fri, Nov/19/2021	91	November	2021	Friday
Sat, Nov/20/2021	-	November	2021	Saturday
Sun, Nov/21/2021	-	November	2021	Sunday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Mon, Nov/22/2021	119	November	2021	Monday
Tue, Nov/23/2021	129	November	2021	Tuesday
Wed, Nov/24/2021	59	November	2021	Wednesday
Thu, Nov/25/2021	-	November	2021	Thursday
Fri, Nov/26/2021	-	November	2021	Friday
Sat, Nov/27/2021	-	November	2021	Saturday
Sun, Nov/28/2021	-	November	2021	Sunday
Mon, Nov/29/2021	70	November	2021	Monday
Tue, Nov/30/2021	117	November	2021	Tuesday
Wed, Dec/01/2021	98	December	2021	Wednesday
Thu, Dec/02/2021	89	December	2021	Thursday
Fri, Dec/03/2021	88	December	2021	Friday
Sat, Dec/04/2021	-	December	2021	Saturday
Sun, Dec/05/2021	-	December	2021	Sunday
Mon, Dec/06/2021	38	December	2021	Monday
Tue, Dec/07/2021	158	December	2021	Tuesday
Wed, Dec/08/2021	120	December	2021	Wednesday
Thu, Dec/09/2021	110	December	2021	Thursday
Fri, Dec/10/2021	133	December	2021	Friday
Sat, Dec/11/2021	-	December	2021	Saturday
Sun, Dec/12/2021	-	December	2021	Sunday
Mon, Dec/13/2021	-	December	2021	Monday
Tue, Dec/14/2021	101	December	2021	Tuesday
Wed, Dec/15/2021	91	December	2021	Wednesday
Thu, Dec/16/2021	132	December	2021	Thursday
Fri, Dec/17/2021	81	December	2021	Friday
Sat, Dec/18/2021	-	December	2021	Saturday
Sun, Dec/19/2021	-	December	2021	Sunday
Mon, Dec/20/2021	67	December	2021	Monday
Tue, Dec/21/2021	32	December	2021	Tuesday
Wed, Dec/22/2021	51	December	2021	Wednesday
Thu, Dec/23/2021	43	December	2021	Thursday
Fri, Dec/24/2021	-	December	2021	Friday
Sat, Dec/25/2021	-	December	2021	Saturday
Sun, Dec/26/2021	-	December	2021	Sunday
Mon, Dec/27/2021	9	December	2021	Monday
Tue, Dec/28/2021	27	December	2021	Tuesday
Wed, Dec/29/2021	16	December	2021	Wednesday
Thu, Dec/30/2021	70	December	2021	Thursday
Fri, Dec/31/2021	-	December	2021	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Jan/01/2022	-	January	2022	Saturday
Sun, Jan/02/2022	-	January	2022	Sunday
Mon, Jan/03/2022	36	January	2022	Monday
Tue, Jan/04/2022	51	January	2022	Tuesday
Wed, Jan/05/2022	27	January	2022	Wednesday
Thu, Jan/06/2022	67	January	2022	Thursday
Fri, Jan/07/2022	53	January	2022	Friday
Sat, Jan/08/2022	-	January	2022	Saturday
Sun, Jan/09/2022	-	January	2022	Sunday
Mon, Jan/10/2022	50	January	2022	Monday
Tue, Jan/11/2022	75	January	2022	Tuesday
Wed, Jan/12/2022	97	January	2022	Wednesday
Thu, Jan/13/2022	50	January	2022	Thursday
Fri, Jan/14/2022	50	January	2022	Friday
Sat, Jan/15/2022	-	January	2022	Saturday
Sun, Jan/16/2022	-	January	2022	Sunday
Mon, Jan/17/2022	26	January	2022	Monday
Tue, Jan/18/2022	42	January	2022	Tuesday
Wed, Jan/19/2022	100	January	2022	Wednesday
Thu, Jan/20/2022	61	January	2022	Thursday
Fri, Jan/21/2022	69	January	2022	Friday
Sat, Jan/22/2022	39	January	2022	Saturday
Sun, Jan/23/2022	-	January	2022	Sunday
Mon, Jan/24/2022	70	January	2022	Monday
Tue, Jan/25/2022	66	January	2022	Tuesday
Wed, Jan/26/2022	66	January	2022	Wednesday
Thu, Jan/27/2022	55	January	2022	Thursday
Fri, Jan/28/2022	66	January	2022	Friday
Sat, Jan/29/2022	-	January	2022	Saturday
Sun, Jan/30/2022	-	January	2022	Sunday
Mon, Jan/31/2022	54	January	2022	Monday
Tue, Feb/01/2022	49	February	2022	Tuesday
Wed, Feb/02/2022	73	February	2022	Wednesday
Thu, Feb/03/2022	54	February	2022	Thursday
Fri, Feb/04/2022	60	February	2022	Friday
Sat, Feb/05/2022	-	February	2022	Saturday
Sun, Feb/06/2022	-	February	2022	Sunday
Mon, Feb/07/2022	57	February	2022	Monday
Tue, Feb/08/2022	46	February	2022	Tuesday
Wed, Feb/09/2022	81	February	2022	Wednesday
Thu, Feb/10/2022	66	February	2022	Thursday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Fri, Feb/11/2022	52	February	2022	Friday
Sat, Feb/12/2022	-	February	2022	Saturday
Sun, Feb/13/2022	-	February	2022	Sunday
Mon, Feb/14/2022	58	February	2022	Monday
Tue, Feb/15/2022	45	February	2022	Tuesday
Wed, Feb/16/2022	63	February	2022	Wednesday
Thu, Feb/17/2022	67	February	2022	Thursday
Fri, Feb/18/2022	60	February	2022	Friday
Sat, Feb/19/2022	-	February	2022	Saturday
Sun, Feb/20/2022	-	February	2022	Sunday
Mon, Feb/21/2022	-	February	2022	Monday
Tue, Feb/22/2022	51	February	2022	Tuesday
Wed, Feb/23/2022	69	February	2022	Wednesday
Thu, Feb/24/2022	69	February	2022	Thursday
Fri, Feb/25/2022	60	February	2022	Friday
Sat, Feb/26/2022	-	February	2022	Saturday
Sun, Feb/27/2022	-	February	2022	Sunday
Mon, Feb/28/2022	38	February	2022	Monday
Tue, Mar/01/2022	53	March	2022	Tuesday
Wed, Mar/02/2022	54	March	2022	Wednesday
Thu, Mar/03/2022	57	March	2022	Thursday
Fri, Mar/04/2022	63	March	2022	Friday
Sat, Mar/05/2022	-	March	2022	Saturday
Sun, Mar/06/2022	-	March	2022	Sunday
Mon, Mar/07/2022	48	March	2022	Monday
Tue, Mar/08/2022	45	March	2022	Tuesday
Wed, Mar/09/2022	72	March	2022	Wednesday
Thu, Mar/10/2022	57	March	2022	Thursday
Fri, Mar/11/2022	73	March	2022	Friday
Sat, Mar/12/2022	-	March	2022	Saturday
Sun, Mar/13/2022	-	March	2022	Sunday
Mon, Mar/14/2022	52	March	2022	Monday
Tue, Mar/15/2022	50	March	2022	Tuesday
Wed, Mar/16/2022	76	March	2022	Wednesday
Thu, Mar/17/2022	73	March	2022	Thursday
Fri, Mar/18/2022	57	March	2022	Friday
Sat, Mar/19/2022	-	March	2022	Saturday
Sun, Mar/20/2022	-	March	2022	Sunday
Mon, Mar/21/2022	82	March	2022	Monday
Tue, Mar/22/2022	37	March	2022	Tuesday
Wed, Mar/23/2022	30	March	2022	Wednesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Thu, Mar/24/2022	54	March	2022	Thursday
Fri, Mar/25/2022	28	March	2022	Friday
Sat, Mar/26/2022	-	March	2022	Saturday
Sun, Mar/27/2022	-	March	2022	Sunday
Mon, Mar/28/2022	53	March	2022	Monday
Tue, Mar/29/2022	55	March	2022	Tuesday
Wed, Mar/30/2022	74	March	2022	Wednesday
Thu, Mar/31/2022	-	March	2022	Thursday
Fri, Apr/01/2022	76	April	2022	Friday
Sat, Apr/02/2022	-	April	2022	Saturday
Sun, Apr/03/2022	-	April	2022	Sunday
Mon, Apr/04/2022	79	April	2022	Monday
Tue, Apr/05/2022	-	April	2022	Tuesday
Wed, Apr/06/2022	-	April	2022	Wednesday
Thu, Apr/07/2022	-	April	2022	Thursday
Fri, Apr/08/2022	67	April	2022	Friday
Sat, Apr/09/2022	-	April	2022	Saturday
Sun, Apr/10/2022	-	April	2022	Sunday
Mon, Apr/11/2022	100	April	2022	Monday
Tue, Apr/12/2022	-	April	2022	Tuesday
Wed, Apr/13/2022	68	April	2022	Wednesday
Thu, Apr/14/2022	47	April	2022	Thursday
Fri, Apr/15/2022	63	April	2022	Friday
Sat, Apr/16/2022	-	April	2022	Saturday
Sun, Apr/17/2022	-	April	2022	Sunday
Mon, Apr/18/2022	80	April	2022	Monday
Tue, Apr/19/2022	1	April	2022	Tuesday
Wed, Apr/20/2022	103	April	2022	Wednesday
Thu, Apr/21/2022	45	April	2022	Thursday
Fri, Apr/22/2022	68	April	2022	Friday
Sat, Apr/23/2022	-	April	2022	Saturday
Sun, Apr/24/2022	-	April	2022	Sunday
Mon, Apr/25/2022	74	April	2022	Monday
Tue, Apr/26/2022	83	April	2022	Tuesday
Wed, Apr/27/2022	62	April	2022	Wednesday
Thu, Apr/28/2022	64	April	2022	Thursday
Fri, Apr/29/2022	57	April	2022	Friday
Sat, Apr/30/2022	-	April	2022	Saturday
Sun, May/01/2022	-	May	2022	Sunday
Mon, May/02/2022	79	May	2022	Monday
Tue, May/03/2022	58	May	2022	Tuesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Wed, May/04/2022	59	May	2022	Wednesday
Thu, May/05/2022	63	May	2022	Thursday
Fri, May/06/2022	57	May	2022	Friday
Sat, May/07/2022	2	May	2022	Saturday
Sun, May/08/2022	-	May	2022	Sunday
Mon, May/09/2022	52	May	2022	Monday
Tue, May/10/2022	49	May	2022	Tuesday
Wed, May/11/2022	50	May	2022	Wednesday
Thu, May/12/2022	59	May	2022	Thursday
Fri, May/13/2022	78	May	2022	Friday
Sat, May/14/2022	-	May	2022	Saturday
Sun, May/15/2022	-	May	2022	Sunday
Mon, May/16/2022	103	May	2022	Monday
Tue, May/17/2022	74	May	2022	Tuesday
Wed, May/18/2022	69	May	2022	Wednesday
Thu, May/19/2022	68	May	2022	Thursday
Fri, May/20/2022	60	May	2022	Friday
Sat, May/21/2022	-	May	2022	Saturday
Sun, May/22/2022	-	May	2022	Sunday
Mon, May/23/2022	65	May	2022	Monday
Tue, May/24/2022	65	May	2022	Tuesday
Wed, May/25/2022	62	May	2022	Wednesday
Thu, May/26/2022	108	May	2022	Thursday
Fri, May/27/2022	45	May	2022	Friday
Sat, May/28/2022	-	May	2022	Saturday
Sun, May/29/2022	-	May	2022	Sunday
Mon, May/30/2022	-	May	2022	Monday
Tue, May/31/2022	50	May	2022	Tuesday
Wed, Jun/01/2022	37	June	2022	Wednesday
Thu, Jun/02/2022	65	June	2022	Thursday
Fri, Jun/03/2022	67	June	2022	Friday
Sat, Jun/04/2022	-	June	2022	Saturday
Sun, Jun/05/2022	-	June	2022	Sunday
Mon, Jun/06/2022	44	June	2022	Monday
Tue, Jun/07/2022	46	June	2022	Tuesday
Wed, Jun/08/2022	49	June	2022	Wednesday
Thu, Jun/09/2022	53	June	2022	Thursday
Fri, Jun/10/2022	21	June	2022	Friday
Sat, Jun/11/2022	-	June	2022	Saturday
Sun, Jun/12/2022	-	June	2022	Sunday
Mon, Jun/13/2022	50	June	2022	Monday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Tue, Jun/14/2022	56	June	2022	Tuesday
Wed, Jun/15/2022	53	June	2022	Wednesday
Thu, Jun/16/2022	59	June	2022	Thursday
Fri, Jun/17/2022	59	June	2022	Friday
Sat, Jun/18/2022	-	June	2022	Saturday
Sun, Jun/19/2022	-	June	2022	Sunday
Mon, Jun/20/2022	50	June	2022	Monday
Tue, Jun/21/2022	65	June	2022	Tuesday
Wed, Jun/22/2022	56	June	2022	Wednesday
Thu, Jun/23/2022	35	June	2022	Thursday
Fri, Jun/24/2022	63	June	2022	Friday
Sat, Jun/25/2022	-	June	2022	Saturday
Sun, Jun/26/2022	-	June	2022	Sunday
Mon, Jun/27/2022	40	June	2022	Monday
Tue, Jun/28/2022	38	June	2022	Tuesday
Wed, Jun/29/2022	42	June	2022	Wednesday
Thu, Jun/30/2022	46	June	2022	Thursday
Fri, Jul/01/2022	54	July	2022	Friday
Sat, Jul/02/2022	-	July	2022	Saturday
Sun, Jul/03/2022	-	July	2022	Sunday
Mon, Jul/04/2022	-	July	2022	Monday
Tue, Jul/05/2022	23	July	2022	Tuesday
Wed, Jul/06/2022	41	July	2022	Wednesday
Thu, Jul/07/2022	36	July	2022	Thursday
Fri, Jul/08/2022	34	July	2022	Friday
Sat, Jul/09/2022	-	July	2022	Saturday
Sun, Jul/10/2022	-	July	2022	Sunday
Mon, Jul/11/2022	29	July	2022	Monday
Tue, Jul/12/2022	48	July	2022	Tuesday
Wed, Jul/13/2022	58	July	2022	Wednesday
Thu, Jul/14/2022	65	July	2022	Thursday
Fri, Jul/15/2022	31	July	2022	Friday
Sat, Jul/16/2022	-	July	2022	Saturday
Sun, Jul/17/2022	-	July	2022	Sunday
Mon, Jul/18/2022	77	July	2022	Monday
Tue, Jul/19/2022	59	July	2022	Tuesday
Wed, Jul/20/2022	60	July	2022	Wednesday
Thu, Jul/21/2022	73	July	2022	Thursday
Fri, Jul/22/2022	60	July	2022	Friday
Sat, Jul/23/2022	-	July	2022	Saturday
Sun, Jul/24/2022	-	July	2022	Sunday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Mon, Jul/25/2022	76	July	2022	Monday
Tue, Jul/26/2022	48	July	2022	Tuesday
Wed, Jul/27/2022	40	July	2022	Wednesday
Thu, Jul/28/2022	35	July	2022	Thursday
Fri, Jul/29/2022	55	July	2022	Friday
Sat, Jul/30/2022	-	July	2022	Saturday
Sun, Jul/31/2022	-	July	2022	Sunday
Mon, Aug/01/2022	48	August	2022	Monday
Tue, Aug/02/2022	33	August	2022	Tuesday
Wed, Aug/03/2022	77	August	2022	Wednesday
Thu, Aug/04/2022	55	August	2022	Thursday
Fri, Aug/05/2022	63	August	2022	Friday
Sat, Aug/06/2022	-	August	2022	Saturday
Sun, Aug/07/2022	-	August	2022	Sunday
Mon, Aug/08/2022	79	August	2022	Monday
Tue, Aug/09/2022	78	August	2022	Tuesday
Wed, Aug/10/2022	81	August	2022	Wednesday
Thu, Aug/11/2022	57	August	2022	Thursday
Fri, Aug/12/2022	37	August	2022	Friday
Sat, Aug/13/2022	-	August	2022	Saturday
Sun, Aug/14/2022	-	August	2022	Sunday
Mon, Aug/15/2022	45	August	2022	Monday
Tue, Aug/16/2022	52	August	2022	Tuesday
Wed, Aug/17/2022	37	August	2022	Wednesday
Thu, Aug/18/2022	49	August	2022	Thursday
Fri, Aug/19/2022	28	August	2022	Friday
Sat, Aug/20/2022	-	August	2022	Saturday
Sun, Aug/21/2022	-	August	2022	Sunday
Mon, Aug/22/2022	81	August	2022	Monday
Tue, Aug/23/2022	71	August	2022	Tuesday
Wed, Aug/24/2022	63	August	2022	Wednesday
Thu, Aug/25/2022	47	August	2022	Thursday
Fri, Aug/26/2022	58	August	2022	Friday
Sat, Aug/27/2022	-	August	2022	Saturday
Sun, Aug/28/2022	-	August	2022	Sunday
Mon, Aug/29/2022	56	August	2022	Monday
Tue, Aug/30/2022	67	August	2022	Tuesday
Wed, Aug/31/2022	78	August	2022	Wednesday
Thu, Sep/01/2022	59	September	2022	Thursday
Fri, Sep/02/2022	47	September	2022	Friday
Sat, Sep/03/2022	-	September	2022	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Sep/04/2022	-	September	2022	Sunday
Mon, Sep/05/2022	-	September	2022	Monday
Tue, Sep/06/2022	44	September	2022	Tuesday
Wed, Sep/07/2022	33	September	2022	Wednesday
Thu, Sep/08/2022	65	September	2022	Thursday
Fri, Sep/09/2022	60	September	2022	Friday
Sat, Sep/10/2022	-	September	2022	Saturday
Sun, Sep/11/2022	-	September	2022	Sunday
Mon, Sep/12/2022	73	September	2022	Monday
Tue, Sep/13/2022	47	September	2022	Tuesday
Wed, Sep/14/2022	55	September	2022	Wednesday
Thu, Sep/15/2022	62	September	2022	Thursday
Fri, Sep/16/2022	47	September	2022	Friday
Sat, Sep/17/2022	-	September	2022	Saturday
Sun, Sep/18/2022	-	September	2022	Sunday
Mon, Sep/19/2022	70	September	2022	Monday
Tue, Sep/20/2022	43	September	2022	Tuesday
Wed, Sep/21/2022	47	September	2022	Wednesday
Thu, Sep/22/2022	62	September	2022	Thursday
Fri, Sep/23/2022	56	September	2022	Friday
Sat, Sep/24/2022	-	September	2022	Saturday
Sun, Sep/25/2022	-	September	2022	Sunday
Mon, Sep/26/2022	46	September	2022	Monday
Tue, Sep/27/2022	57	September	2022	Tuesday
Wed, Sep/28/2022	46	September	2022	Wednesday
Thu, Sep/29/2022	58	September	2022	Thursday
Fri, Sep/30/2022	43	September	2022	Friday
Sat, Oct/01/2022	-	October	2022	Saturday
Sun, Oct/02/2022	-	October	2022	Sunday
Mon, Oct/03/2022	48	October	2022	Monday
Tue, Oct/04/2022	43	October	2022	Tuesday
Wed, Oct/05/2022	51	October	2022	Wednesday
Thu, Oct/06/2022	47	October	2022	Thursday
Fri, Oct/07/2022	36	October	2022	Friday
Sat, Oct/08/2022	-	October	2022	Saturday
Sun, Oct/09/2022	-	October	2022	Sunday
Mon, Oct/10/2022	51	October	2022	Monday
Tue, Oct/11/2022	42	October	2022	Tuesday
Wed, Oct/12/2022	47	October	2022	Wednesday
Thu, Oct/13/2022	75	October	2022	Thursday
Fri, Oct/14/2022	45	October	2022	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Oct/15/2022	-	October	2022	Saturday
Sun, Oct/16/2022	-	October	2022	Sunday
Mon, Oct/17/2022	58	October	2022	Monday
Tue, Oct/18/2022	69	October	2022	Tuesday
Wed, Oct/19/2022	64	October	2022	Wednesday
Thu, Oct/20/2022	58	October	2022	Thursday
Fri, Oct/21/2022	49	October	2022	Friday
Sat, Oct/22/2022	-	October	2022	Saturday
Sun, Oct/23/2022	-	October	2022	Sunday
Mon, Oct/24/2022	63	October	2022	Monday
Tue, Oct/25/2022	58	October	2022	Tuesday
Wed, Oct/26/2022	41	October	2022	Wednesday
Thu, Oct/27/2022	61	October	2022	Thursday
Fri, Oct/28/2022	44	October	2022	Friday
Sat, Oct/29/2022	18	October	2022	Saturday
Sun, Oct/30/2022	-	October	2022	Sunday
Mon, Oct/31/2022	64	October	2022	Monday
Tue, Nov/01/2022	28	November	2022	Tuesday
Wed, Nov/02/2022	40	November	2022	Wednesday
Thu, Nov/03/2022	63	November	2022	Thursday
Fri, Nov/04/2022	38	November	2022	Friday
Sat, Nov/05/2022	-	November	2022	Saturday
Sun, Nov/06/2022	-	November	2022	Sunday
Mon, Nov/07/2022	63	November	2022	Monday
Tue, Nov/08/2022	22	November	2022	Tuesday
Wed, Nov/09/2022	59	November	2022	Wednesday
Thu, Nov/10/2022	80	November	2022	Thursday
Fri, Nov/11/2022	70	November	2022	Friday
Sat, Nov/12/2022	-	November	2022	Saturday
Sun, Nov/13/2022	-	November	2022	Sunday
Mon, Nov/14/2022	51	November	2022	Monday
Tue, Nov/15/2022	56	November	2022	Tuesday
Wed, Nov/16/2022	60	November	2022	Wednesday
Thu, Nov/17/2022	49	November	2022	Thursday
Fri, Nov/18/2022	49	November	2022	Friday
Sat, Nov/19/2022	15	November	2022	Saturday
Sun, Nov/20/2022	-	November	2022	Sunday
Mon, Nov/21/2022	80	November	2022	Monday
Tue, Nov/22/2022	45	November	2022	Tuesday
Wed, Nov/23/2022	55	November	2022	Wednesday
Thu, Nov/24/2022	-	November	2022	Thursday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Fri, Nov/25/2022	-	November	2022	Friday
Sat, Nov/26/2022	-	November	2022	Saturday
Sun, Nov/27/2022	-	November	2022	Sunday
Mon, Nov/28/2022	37	November	2022	Monday
Tue, Nov/29/2022	56	November	2022	Tuesday
Wed, Nov/30/2022	74	November	2022	Wednesday
Thu, Dec/01/2022	26	December	2022	Thursday
Fri, Dec/02/2022	21	December	2022	Friday
Sat, Dec/03/2022	-	December	2022	Saturday
Sun, Dec/04/2022	-	December	2022	Sunday
Mon, Dec/05/2022	34	December	2022	Monday
Tue, Dec/06/2022	33	December	2022	Tuesday
Wed, Dec/07/2022	44	December	2022	Wednesday
Thu, Dec/08/2022	63	December	2022	Thursday
Fri, Dec/09/2022	39	December	2022	Friday
Sat, Dec/10/2022	-	December	2022	Saturday
Sun, Dec/11/2022	-	December	2022	Sunday
Mon, Dec/12/2022	28	December	2022	Monday
Tue, Dec/13/2022	46	December	2022	Tuesday
Wed, Dec/14/2022	32	December	2022	Wednesday
Thu, Dec/15/2022	41	December	2022	Thursday
Fri, Dec/16/2022	47	December	2022	Friday
Sat, Dec/17/2022	-	December	2022	Saturday
Sun, Dec/18/2022	-	December	2022	Sunday
Mon, Dec/19/2022	42	December	2022	Monday
Tue, Dec/20/2022	45	December	2022	Tuesday
Wed, Dec/21/2022	44	December	2022	Wednesday
Thu, Dec/22/2022	41	December	2022	Thursday
Fri, Dec/23/2022	43	December	2022	Friday
Sat, Dec/24/2022	-	December	2022	Saturday
Sun, Dec/25/2022	-	December	2022	Sunday
Mon, Dec/26/2022	-	December	2022	Monday
Tue, Dec/27/2022	33	December	2022	Tuesday
Wed, Dec/28/2022	23	December	2022	Wednesday
Thu, Dec/29/2022	23	December	2022	Thursday
Fri, Dec/30/2022	5	December	2022	Friday
Sat, Dec/31/2022	-	December	2022	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Jan/01/2023	-	January	2023	Sunday
Mon, Jan/02/2023	-	January	2023	Monday
Tue, Jan/03/2023	45	January	2023	Tuesday
Wed, Jan/04/2023	13	January	2023	Wednesday
Thu, Jan/05/2023	17	January	2023	Thursday
Fri, Jan/06/2023	43	January	2023	Friday
Sat, Jan/07/2023	-	January	2023	Saturday
Sun, Jan/08/2023	-	January	2023	Sunday
Mon, Jan/09/2023	19	January	2023	Monday
Tue, Jan/10/2023	23	January	2023	Tuesday
Wed, Jan/11/2023	18	January	2023	Wednesday
Thu, Jan/12/2023	64	January	2023	Thursday
Fri, Jan/13/2023	21	January	2023	Friday
Sat, Jan/14/2023	-	January	2023	Saturday
Sun, Jan/15/2023	-	January	2023	Sunday
Mon, Jan/16/2023	2	January	2023	Monday
Tue, Jan/17/2023	22	January	2023	Tuesday
Wed, Jan/18/2023	40	January	2023	Wednesday
Thu, Jan/19/2023	46	January	2023	Thursday
Fri, Jan/20/2023	43	January	2023	Friday
Sat, Jan/21/2023	-	January	2023	Saturday
Sun, Jan/22/2023	-	January	2023	Sunday
Mon, Jan/23/2023	50	January	2023	Monday
Tue, Jan/24/2023	47	January	2023	Tuesday
Wed, Jan/25/2023	49	January	2023	Wednesday
Thu, Jan/26/2023	69	January	2023	Thursday
Fri, Jan/27/2023	61	January	2023	Friday
Sat, Jan/28/2023	-	January	2023	Saturday
Sun, Jan/29/2023	-	January	2023	Sunday
Mon, Jan/30/2023	59	January	2023	Monday
Tue, Jan/31/2023	48	January	2023	Tuesday
Wed, Feb/01/2023	53	February	2023	Wednesday
Thu, Feb/02/2023	54	February	2023	Thursday
Fri, Feb/03/2023	46	February	2023	Friday
Sat, Feb/04/2023	-	February	2023	Saturday
Sun, Feb/05/2023	-	February	2023	Sunday
Mon, Feb/06/2023	82	February	2023	Monday
Tue, Feb/07/2023	82	February	2023	Tuesday
Wed, Feb/08/2023	99	February	2023	Wednesday
Thu, Feb/09/2023	102	February	2023	Thursday
Fri, Feb/10/2023	77	February	2023	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Feb/11/2023	-	February	2023	Saturday
Sun, Feb/12/2023	-	February	2023	Sunday
Mon, Feb/13/2023	84	February	2023	Monday
Tue, Feb/14/2023	86	February	2023	Tuesday
Wed, Feb/15/2023	67	February	2023	Wednesday
Thu, Feb/16/2023	70	February	2023	Thursday
Fri, Feb/17/2023	61	February	2023	Friday
Sat, Feb/18/2023	-	February	2023	Saturday
Sun, Feb/19/2023	-	February	2023	Sunday
Mon, Feb/20/2023	-	February	2023	Monday
Tue, Feb/21/2023	39	February	2023	Tuesday
Wed, Feb/22/2023	86	February	2023	Wednesday
Thu, Feb/23/2023	94	February	2023	Thursday
Fri, Feb/24/2023	70	February	2023	Friday
Sat, Feb/25/2023	-	February	2023	Saturday
Sun, Feb/26/2023	-	February	2023	Sunday
Mon, Feb/27/2023	33	February	2023	Monday
Tue, Feb/28/2023	114	February	2023	Tuesday
Wed, Mar/01/2023	114	March	2023	Wednesday
Thu, Mar/02/2023	128	March	2023	Thursday
Fri, Mar/03/2023	136	March	2023	Friday
Sat, Mar/04/2023	-	March	2023	Saturday
Sun, Mar/05/2023	-	March	2023	Sunday
Mon, Mar/06/2023	96	March	2023	Monday
Tue, Mar/07/2023	127	March	2023	Tuesday
Wed, Mar/08/2023	132	March	2023	Wednesday
Thu, Mar/09/2023	79	March	2023	Thursday
Fri, Mar/10/2023	38	March	2023	Friday
Sat, Mar/11/2023	-	March	2023	Saturday
Sun, Mar/12/2023	-	March	2023	Sunday
Mon, Mar/13/2023	87	March	2023	Monday
Tue, Mar/14/2023	72	March	2023	Tuesday
Wed, Mar/15/2023	110	March	2023	Wednesday
Thu, Mar/16/2023	125	March	2023	Thursday
Fri, Mar/17/2023	156	March	2023	Friday
Sat, Mar/18/2023	-	March	2023	Saturday
Sun, Mar/19/2023	-	March	2023	Sunday
Mon, Mar/20/2023	81	March	2023	Monday
Tue, Mar/21/2023	70	March	2023	Tuesday
Wed, Mar/22/2023	21	March	2023	Wednesday
Thu, Mar/23/2023	100	March	2023	Thursday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Fri, Mar/24/2023	63	March	2023	Friday
Sat, Mar/25/2023	-	March	2023	Saturday
Sun, Mar/26/2023	-	March	2023	Sunday
Mon, Mar/27/2023	47	March	2023	Monday
Tue, Mar/28/2023	22	March	2023	Tuesday
Wed, Mar/29/2023	20	March	2023	Wednesday
Thu, Mar/30/2023	53	March	2023	Thursday
Fri, Mar/31/2023	39	March	2023	Friday
Sat, Apr/01/2023	-	April	2023	Saturday
Sun, Apr/02/2023	-	April	2023	Sunday
Mon, Apr/03/2023	27	April	2023	Monday
Tue, Apr/04/2023	21	April	2023	Tuesday
Wed, Apr/05/2023	40	April	2023	Wednesday
Thu, Apr/06/2023	39	April	2023	Thursday
Fri, Apr/07/2023	42	April	2023	Friday
Sat, Apr/08/2023	-	April	2023	Saturday
Sun, Apr/09/2023	-	April	2023	Sunday
Mon, Apr/10/2023	37	April	2023	Monday
Tue, Apr/11/2023	29	April	2023	Tuesday
Wed, Apr/12/2023	26	April	2023	Wednesday
Thu, Apr/13/2023	42	April	2023	Thursday
Fri, Apr/14/2023	31	April	2023	Friday
Sat, Apr/15/2023	-	April	2023	Saturday
Sun, Apr/16/2023	-	April	2023	Sunday
Mon, Apr/17/2023	37	April	2023	Monday
Tue, Apr/18/2023	19	April	2023	Tuesday
Wed, Apr/19/2023	44	April	2023	Wednesday
Thu, Apr/20/2023	46	April	2023	Thursday
Fri, Apr/21/2023	32	April	2023	Friday
Sat, Apr/22/2023	-	April	2023	Saturday
Sun, Apr/23/2023	-	April	2023	Sunday
Mon, Apr/24/2023	20	April	2023	Monday
Tue, Apr/25/2023	68	April	2023	Tuesday
Wed, Apr/26/2023	110	April	2023	Wednesday
Thu, Apr/27/2023	102	April	2023	Thursday
Fri, Apr/28/2023	23	April	2023	Friday
Sat, Apr/29/2023	-	April	2023	Saturday
Sun, Apr/30/2023	-	April	2023	Sunday
Mon, May/01/2023	16	May	2023	Monday
Tue, May/02/2023	15	May	2023	Tuesday
Wed, May/03/2023	20	May	2023	Wednesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Thu, May/04/2023	41	May	2023	Thursday
Fri, May/05/2023	39	May	2023	Friday
Sat, May/06/2023	-	May	2023	Saturday
Sun, May/07/2023	-	May	2023	Sunday
Mon, May/08/2023	23	May	2023	Monday
Tue, May/09/2023	42	May	2023	Tuesday
Wed, May/10/2023	30	May	2023	Wednesday
Thu, May/11/2023	25	May	2023	Thursday
Fri, May/12/2023	18	May	2023	Friday
Sat, May/13/2023	-	May	2023	Saturday
Sun, May/14/2023	-	May	2023	Sunday
Mon, May/15/2023	34	May	2023	Monday
Tue, May/16/2023	12	May	2023	Tuesday
Wed, May/17/2023	30	May	2023	Wednesday
Thu, May/18/2023	11	May	2023	Thursday
Fri, May/19/2023	24	May	2023	Friday
Sat, May/20/2023	-	May	2023	Saturday
Sun, May/21/2023	-	May	2023	Sunday
Mon, May/22/2023	26	May	2023	Monday
Tue, May/23/2023	43	May	2023	Tuesday
Wed, May/24/2023	16	May	2023	Wednesday
Thu, May/25/2023	17	May	2023	Thursday
Fri, May/26/2023	35	May	2023	Friday
Sat, May/27/2023	-	May	2023	Saturday
Sun, May/28/2023	-	May	2023	Sunday
Mon, May/29/2023	-	May	2023	Monday
Tue, May/30/2023	42	May	2023	Tuesday
Wed, May/31/2023	45	May	2023	Wednesday
Thu, Jun/01/2023	36	June	2023	Thursday
Fri, Jun/02/2023	65	June	2023	Friday
Sat, Jun/03/2023	-	June	2023	Saturday
Sun, Jun/04/2023	-	June	2023	Sunday
Mon, Jun/05/2023	39	June	2023	Monday
Tue, Jun/06/2023	32	June	2023	Tuesday
Wed, Jun/07/2023	66	June	2023	Wednesday
Thu, Jun/08/2023	47	June	2023	Thursday
Fri, Jun/09/2023	25	June	2023	Friday
Sat, Jun/10/2023	-	June	2023	Saturday
Sun, Jun/11/2023	-	June	2023	Sunday
Mon, Jun/12/2023	40	June	2023	Monday
Tue, Jun/13/2023	55	June	2023	Tuesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Wed, Jun/14/2023	40	June	2023	Wednesday
Thu, Jun/15/2023	33	June	2023	Thursday
Fri, Jun/16/2023	41	June	2023	Friday
Sat, Jun/17/2023	-	June	2023	Saturday
Sun, Jun/18/2023	-	June	2023	Sunday
Mon, Jun/19/2023	22	June	2023	Monday
Tue, Jun/20/2023	25	June	2023	Tuesday
Wed, Jun/21/2023	21	June	2023	Wednesday
Thu, Jun/22/2023	36	June	2023	Thursday
Fri, Jun/23/2023	43	June	2023	Friday
Sat, Jun/24/2023	-	June	2023	Saturday
Sun, Jun/25/2023	-	June	2023	Sunday
Mon, Jun/26/2023	53	June	2023	Monday
Tue, Jun/27/2023	30	June	2023	Tuesday
Wed, Jun/28/2023	39	June	2023	Wednesday
Thu, Jun/29/2023	41	June	2023	Thursday
Fri, Jun/30/2023	29	June	2023	Friday
Sat, Jul/01/2023	-	July	2023	Saturday
Sun, Jul/02/2023	-	July	2023	Sunday
Mon, Jul/03/2023	-	July	2023	Monday
Tue, Jul/04/2023	-	July	2023	Tuesday
Wed, Jul/05/2023	11	July	2023	Wednesday
Thu, Jul/06/2023	23	July	2023	Thursday
Fri, Jul/07/2023	32	July	2023	Friday
Sat, Jul/08/2023	-	July	2023	Saturday
Sun, Jul/09/2023	-	July	2023	Sunday
Mon, Jul/10/2023	19	July	2023	Monday
Tue, Jul/11/2023	14	July	2023	Tuesday
Wed, Jul/12/2023	23	July	2023	Wednesday
Thu, Jul/13/2023	16	July	2023	Thursday
Fri, Jul/14/2023	21	July	2023	Friday
Sat, Jul/15/2023	-	July	2023	Saturday
Sun, Jul/16/2023	-	July	2023	Sunday
Mon, Jul/17/2023	17	July	2023	Monday
Tue, Jul/18/2023	24	July	2023	Tuesday
Wed, Jul/19/2023	17	July	2023	Wednesday
Thu, Jul/20/2023	30	July	2023	Thursday
Fri, Jul/21/2023	23	July	2023	Friday
Sat, Jul/22/2023	-	July	2023	Saturday
Sun, Jul/23/2023	-	July	2023	Sunday
Mon, Jul/24/2023	33	July	2023	Monday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Tue, Jul/25/2023	17	July	2023	Tuesday
Wed, Jul/26/2023	31	July	2023	Wednesday
Thu, Jul/27/2023	7	July	2023	Thursday
Fri, Jul/28/2023	25	July	2023	Friday
Sat, Jul/29/2023	-	July	2023	Saturday
Sun, Jul/30/2023	-	July	2023	Sunday
Mon, Jul/31/2023	26	July	2023	Monday
Tue, Aug/01/2023	16	August	2023	Tuesday
Wed, Aug/02/2023	20	August	2023	Wednesday
Thu, Aug/03/2023	33	August	2023	Thursday
Fri, Aug/04/2023	30	August	2023	Friday
Sat, Aug/05/2023	-	August	2023	Saturday
Sun, Aug/06/2023	-	August	2023	Sunday
Mon, Aug/07/2023	20	August	2023	Monday
Tue, Aug/08/2023	22	August	2023	Tuesday
Wed, Aug/09/2023	40	August	2023	Wednesday
Thu, Aug/10/2023	23	August	2023	Thursday
Fri, Aug/11/2023	29	August	2023	Friday
Sat, Aug/12/2023	-	August	2023	Saturday
Sun, Aug/13/2023	-	August	2023	Sunday
Mon, Aug/14/2023	21	August	2023	Monday
Tue, Aug/15/2023	22	August	2023	Tuesday
Wed, Aug/16/2023	19	August	2023	Wednesday
Thu, Aug/17/2023	17	August	2023	Thursday
Fri, Aug/18/2023	18	August	2023	Friday
Sat, Aug/19/2023	-	August	2023	Saturday
Sun, Aug/20/2023	-	August	2023	Sunday
Mon, Aug/21/2023	14	August	2023	Monday
Tue, Aug/22/2023	18	August	2023	Tuesday
Wed, Aug/23/2023	24	August	2023	Wednesday
Thu, Aug/24/2023	7	August	2023	Thursday
Fri, Aug/25/2023	21	August	2023	Friday
Sat, Aug/26/2023	-	August	2023	Saturday
Sun, Aug/27/2023	-	August	2023	Sunday
Mon, Aug/28/2023	24	August	2023	Monday
Tue, Aug/29/2023	28	August	2023	Tuesday
Wed, Aug/30/2023	25	August	2023	Wednesday
Thu, Aug/31/2023	31	August	2023	Thursday
Fri, Sep/01/2023	27	September	2023	Friday
Sat, Sep/02/2023	-	September	2023	Saturday
Sun, Sep/03/2023	-	September	2023	Sunday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Mon, Sep/04/2023	-	September	2023	Monday
Tue, Sep/05/2023	18	September	2023	Tuesday
Wed, Sep/06/2023	19	September	2023	Wednesday
Thu, Sep/07/2023	18	September	2023	Thursday
Fri, Sep/08/2023	13	September	2023	Friday
Sat, Sep/09/2023	-	September	2023	Saturday
Sun, Sep/10/2023	-	September	2023	Sunday
Mon, Sep/11/2023	4	September	2023	Monday
Tue, Sep/12/2023	17	September	2023	Tuesday
Wed, Sep/13/2023	18	September	2023	Wednesday
Thu, Sep/14/2023	16	September	2023	Thursday
Fri, Sep/15/2023	22	September	2023	Friday
Sat, Sep/16/2023	-	September	2023	Saturday
Sun, Sep/17/2023	-	September	2023	Sunday
Mon, Sep/18/2023	3	September	2023	Monday
Tue, Sep/19/2023	10	September	2023	Tuesday
Wed, Sep/20/2023	18	September	2023	Wednesday
Thu, Sep/21/2023	18	September	2023	Thursday
Fri, Sep/22/2023	25	September	2023	Friday
Sat, Sep/23/2023	-	September	2023	Saturday
Sun, Sep/24/2023	-	September	2023	Sunday
Mon, Sep/25/2023	9	September	2023	Monday
Tue, Sep/26/2023	-	September	2023	Tuesday
Wed, Sep/27/2023	4	September	2023	Wednesday
Thu, Sep/28/2023	12	September	2023	Thursday
Fri, Sep/29/2023	15	September	2023	Friday
Sat, Sep/30/2023	-	September	2023	Saturday
Sun, Oct/01/2023	-	October	2023	Sunday
Mon, Oct/02/2023	25	October	2023	Monday
Tue, Oct/03/2023	21	October	2023	Tuesday
Wed, Oct/04/2023	22	October	2023	Wednesday
Thu, Oct/05/2023	22	October	2023	Thursday
Fri, Oct/06/2023	25	October	2023	Friday
Sat, Oct/07/2023	-	October	2023	Saturday
Sun, Oct/08/2023	-	October	2023	Sunday
Mon, Oct/09/2023	6	October	2023	Monday
Tue, Oct/10/2023	18	October	2023	Tuesday
Wed, Oct/11/2023	16	October	2023	Wednesday
Thu, Oct/12/2023	18	October	2023	Thursday
Fri, Oct/13/2023	21	October	2023	Friday
Sat, Oct/14/2023	-	October	2023	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Oct/15/2023	-	October	2023	Sunday
Mon, Oct/16/2023	15	October	2023	Monday
Tue, Oct/17/2023	17	October	2023	Tuesday
Wed, Oct/18/2023	17	October	2023	Wednesday
Thu, Oct/19/2023	14	October	2023	Thursday
Fri, Oct/20/2023	18	October	2023	Friday
Sat, Oct/21/2023	-	October	2023	Saturday
Sun, Oct/22/2023	-	October	2023	Sunday
Mon, Oct/23/2023	16	October	2023	Monday
Tue, Oct/24/2023	24	October	2023	Tuesday
Wed, Oct/25/2023	12	October	2023	Wednesday
Thu, Oct/26/2023	22	October	2023	Thursday
Fri, Oct/27/2023	14	October	2023	Friday
Sat, Oct/28/2023	-	October	2023	Saturday
Sun, Oct/29/2023	-	October	2023	Sunday
Mon, Oct/30/2023	11	October	2023	Monday
Tue, Oct/31/2023	10	October	2023	Tuesday
Wed, Nov/01/2023	19	November	2023	Wednesday
Thu, Nov/02/2023	31	November	2023	Thursday
Fri, Nov/03/2023	22	November	2023	Friday
Sat, Nov/04/2023	-	November	2023	Saturday
Sun, Nov/05/2023	-	November	2023	Sunday
Mon, Nov/06/2023	17	November	2023	Monday
Tue, Nov/07/2023	30	November	2023	Tuesday
Wed, Nov/08/2023	11	November	2023	Wednesday
Thu, Nov/09/2023	17	November	2023	Thursday
Fri, Nov/10/2023	19	November	2023	Friday
Sat, Nov/11/2023	-	November	2023	Saturday
Sun, Nov/12/2023	-	November	2023	Sunday
Mon, Nov/13/2023	12	November	2023	Monday
Tue, Nov/14/2023	19	November	2023	Tuesday
Wed, Nov/15/2023	8	November	2023	Wednesday
Thu, Nov/16/2023	15	November	2023	Thursday
Fri, Nov/17/2023	8	November	2023	Friday
Sat, Nov/18/2023	-	November	2023	Saturday
Sun, Nov/19/2023	-	November	2023	Sunday
Mon, Nov/20/2023	22	November	2023	Monday
Tue, Nov/21/2023	26	November	2023	Tuesday
Wed, Nov/22/2023	18	November	2023	Wednesday
Thu, Nov/23/2023	-	November	2023	Thursday
Fri, Nov/24/2023	-	November	2023	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Nov/25/2023	-	November	2023	Saturday
Sun, Nov/26/2023	-	November	2023	Sunday
Mon, Nov/27/2023	11	November	2023	Monday
Tue, Nov/28/2023	11	November	2023	Tuesday
Wed, Nov/29/2023	13	November	2023	Wednesday
Thu, Nov/30/2023	24	November	2023	Thursday
Fri, Dec/01/2023	17	December	2023	Friday
Sat, Dec/02/2023	-	December	2023	Saturday
Sun, Dec/03/2023	-	December	2023	Sunday
Mon, Dec/04/2023	8	December	2023	Monday
Tue, Dec/05/2023	32	December	2023	Tuesday
Wed, Dec/06/2023	7	December	2023	Wednesday
Thu, Dec/07/2023	17	December	2023	Thursday
Fri, Dec/08/2023	12	December	2023	Friday
Sat, Dec/09/2023	-	December	2023	Saturday
Sun, Dec/10/2023	-	December	2023	Sunday
Mon, Dec/11/2023	12	December	2023	Monday
Tue, Dec/12/2023	12	December	2023	Tuesday
Wed, Dec/13/2023	29	December	2023	Wednesday
Thu, Dec/14/2023	12	December	2023	Thursday
Fri, Dec/15/2023	11	December	2023	Friday
Sat, Dec/16/2023	-	December	2023	Saturday
Sun, Dec/17/2023	-	December	2023	Sunday
Mon, Dec/18/2023	3	December	2023	Monday
Tue, Dec/19/2023	7	December	2023	Tuesday
Wed, Dec/20/2023	3	December	2023	Wednesday
Thu, Dec/21/2023	12	December	2023	Thursday
Fri, Dec/22/2023	19	December	2023	Friday
Sat, Dec/23/2023	-	December	2023	Saturday
Sun, Dec/24/2023	-	December	2023	Sunday
Mon, Dec/25/2023	-	December	2023	Monday
Tue, Dec/26/2023	-	December	2023	Tuesday
Wed, Dec/27/2023	12	December	2023	Wednesday
Thu, Dec/28/2023	16	December	2023	Thursday
Fri, Dec/29/2023	2	December	2023	Friday
Sat, Dec/30/2023	-	December	2023	Saturday
Sun, Dec/31/2023	-	December	2023	Sunday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Mon, Jan/01/2024	-	January	2024	Monday
Tue, Jan/02/2024	14	January	2024	Tuesday
Wed, Jan/03/2024	20	January	2024	Wednesday
Thu, Jan/04/2024	55	January	2024	Thursday
Fri, Jan/05/2024	35	January	2024	Friday
Sat, Jan/06/2024	-	January	2024	Saturday
Sun, Jan/07/2024	-	January	2024	Sunday
Mon, Jan/08/2024	48	January	2024	Monday
Tue, Jan/09/2024	38	January	2024	Tuesday
Wed, Jan/10/2024	19	January	2024	Wednesday
Thu, Jan/11/2024	36	January	2024	Thursday
Fri, Jan/12/2024	42	January	2024	Friday
Sat, Jan/13/2024	-	January	2024	Saturday
Sun, Jan/14/2024	-	January	2024	Sunday
Mon, Jan/15/2024	5	January	2024	Monday
Tue, Jan/16/2024	22	January	2024	Tuesday
Wed, Jan/17/2024	33	January	2024	Wednesday
Thu, Jan/18/2024	42	January	2024	Thursday
Fri, Jan/19/2024	37	January	2024	Friday
Sat, Jan/20/2024	-	January	2024	Saturday
Sun, Jan/21/2024	-	January	2024	Sunday
Mon, Jan/22/2024	22	January	2024	Monday
Tue, Jan/23/2024	27	January	2024	Tuesday
Wed, Jan/24/2024	21	January	2024	Wednesday
Thu, Jan/25/2024	32	January	2024	Thursday
Fri, Jan/26/2024	51	January	2024	Friday
Sat, Jan/27/2024	-	January	2024	Saturday
Sun, Jan/28/2024	-	January	2024	Sunday
Mon, Jan/29/2024	27	January	2024	Monday
Tue, Jan/30/2024	36	January	2024	Tuesday
Wed, Jan/31/2024	12	January	2024	Wednesday
Thu, Feb/01/2024	27	February	2024	Thursday
Fri, Feb/02/2024	57	February	2024	Friday
Sat, Feb/03/2024	-	February	2024	Saturday
Sun, Feb/04/2024	-	February	2024	Sunday
Mon, Feb/05/2024	11	February	2024	Monday
Tue, Feb/06/2024	22	February	2024	Tuesday
Wed, Feb/07/2024	22	February	2024	Wednesday
Thu, Feb/08/2024	34	February	2024	Thursday
Fri, Feb/09/2024	39	February	2024	Friday
Sat, Feb/10/2024	-	February	2024	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Feb/11/2024	-	February	2024	Sunday
Mon, Feb/12/2024	48	February	2024	Monday
Tue, Feb/13/2024	16	February	2024	Tuesday
Wed, Feb/14/2024	54	February	2024	Wednesday
Thu, Feb/15/2024	62	February	2024	Thursday
Fri, Feb/16/2024	28	February	2024	Friday
Sat, Feb/17/2024	-	February	2024	Saturday
Sun, Feb/18/2024	-	February	2024	Sunday
Mon, Feb/19/2024	-	February	2024	Monday
Tue, Feb/20/2024	15	February	2024	Tuesday
Wed, Feb/21/2024	25	February	2024	Wednesday
Thu, Feb/22/2024	22	February	2024	Thursday
Fri, Feb/23/2024	34	February	2024	Friday
Sat, Feb/24/2024	-	February	2024	Saturday
Sun, Feb/25/2024	-	February	2024	Sunday
Mon, Feb/26/2024	25	February	2024	Monday
Tue, Feb/27/2024	24	February	2024	Tuesday
Wed, Feb/28/2024	41	February	2024	Wednesday
Thu, Feb/29/2024	30	February	2024	Thursday
Fri, Mar/01/2024	20	March	2024	Friday
Sat, Mar/02/2024	-	March	2024	Saturday
Sun, Mar/03/2024	-	March	2024	Sunday
Mon, Mar/04/2024	21	March	2024	Monday
Tue, Mar/05/2024	25	March	2024	Tuesday
Wed, Mar/06/2024	30	March	2024	Wednesday
Thu, Mar/07/2024	40	March	2024	Thursday
Fri, Mar/08/2024	59	March	2024	Friday
Sat, Mar/09/2024	-	March	2024	Saturday
Sun, Mar/10/2024	-	March	2024	Sunday
Mon, Mar/11/2024	48	March	2024	Monday
Tue, Mar/12/2024	65	March	2024	Tuesday
Wed, Mar/13/2024	44	March	2024	Wednesday
Thu, Mar/14/2024	50	March	2024	Thursday
Fri, Mar/15/2024	-	March	2024	Friday
Sat, Mar/16/2024	-	March	2024	Saturday
Sun, Mar/17/2024	-	March	2024	Sunday
Mon, Mar/18/2024	33	March	2024	Monday
Tue, Mar/19/2024	51	March	2024	Tuesday
Wed, Mar/20/2024	46	March	2024	Wednesday
Thu, Mar/21/2024	43	March	2024	Thursday
Fri, Mar/22/2024	26	March	2024	Friday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sat, Mar/23/2024	-	March	2024	Saturday
Sun, Mar/24/2024	-	March	2024	Sunday
Mon, Mar/25/2024	35	March	2024	Monday
Tue, Mar/26/2024	24	March	2024	Tuesday
Wed, Mar/27/2024	-	March	2024	Wednesday
Thu, Mar/28/2024	26	March	2024	Thursday
Fri, Mar/29/2024	12	March	2024	Friday
Sat, Mar/30/2024	-	March	2024	Saturday
Sun, Mar/31/2024	-	March	2024	Sunday
Mon, Apr/01/2024	36	April	2024	Monday
Tue, Apr/02/2024	41	April	2024	Tuesday
Wed, Apr/03/2024	32	April	2024	Wednesday
Thu, Apr/04/2024	33	April	2024	Thursday
Fri, Apr/05/2024	36	April	2024	Friday
Sat, Apr/06/2024	-	April	2024	Saturday
Sun, Apr/07/2024	-	April	2024	Sunday
Mon, Apr/08/2024	32	April	2024	Monday
Tue, Apr/09/2024	28	April	2024	Tuesday
Wed, Apr/10/2024	27	April	2024	Wednesday
Thu, Apr/11/2024	28	April	2024	Thursday
Fri, Apr/12/2024	30	April	2024	Friday
Sat, Apr/13/2024	-	April	2024	Saturday
Sun, Apr/14/2024	-	April	2024	Sunday
Mon, Apr/15/2024	28	April	2024	Monday
Tue, Apr/16/2024	24	April	2024	Tuesday
Wed, Apr/17/2024	50	April	2024	Wednesday
Thu, Apr/18/2024	30	April	2024	Thursday
Fri, Apr/19/2024	30	April	2024	Friday
Sat, Apr/20/2024	-	April	2024	Saturday
Sun, Apr/21/2024	-	April	2024	Sunday
Mon, Apr/22/2024	54	April	2024	Monday
Tue, Apr/23/2024	33	April	2024	Tuesday
Wed, Apr/24/2024	36	April	2024	Wednesday
Thu, Apr/25/2024	37	April	2024	Thursday
Fri, Apr/26/2024	43	April	2024	Friday
Sat, Apr/27/2024	-	April	2024	Saturday
Sun, Apr/28/2024	-	April	2024	Sunday
Mon, Apr/29/2024	28	April	2024	Monday
Tue, Apr/30/2024	32	April	2024	Tuesday
Wed, May/01/2024	33	May	2024	Wednesday
Thu, May/02/2024	38	May	2024	Thursday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Fri, May/03/2024	36	May	2024	Friday
Sat, May/04/2024	-	May	2024	Saturday
Sun, May/05/2024	-	May	2024	Sunday
Mon, May/06/2024	37	May	2024	Monday
Tue, May/07/2024	36	May	2024	Tuesday
Wed, May/08/2024	17	May	2024	Wednesday
Thu, May/09/2024	35	May	2024	Thursday
Fri, May/10/2024	44	May	2024	Friday
Sat, May/11/2024	-	May	2024	Saturday
Sun, May/12/2024	-	May	2024	Sunday
Mon, May/13/2024	19	May	2024	Monday
Tue, May/14/2024	21	May	2024	Tuesday
Wed, May/15/2024	28	May	2024	Wednesday
Thu, May/16/2024	23	May	2024	Thursday
Fri, May/17/2024	27	May	2024	Friday
Sat, May/18/2024	-	May	2024	Saturday
Sun, May/19/2024	-	May	2024	Sunday
Mon, May/20/2024	23	May	2024	Monday
Tue, May/21/2024	21	May	2024	Tuesday
Wed, May/22/2024	28	May	2024	Wednesday
Thu, May/23/2024	26	May	2024	Thursday
Fri, May/24/2024	27	May	2024	Friday
Sat, May/25/2024	-	May	2024	Saturday
Sun, May/26/2024	-	May	2024	Sunday
Mon, May/27/2024	-	May	2024	Monday
Tue, May/28/2024	20	May	2024	Tuesday
Wed, May/29/2024	21	May	2024	Wednesday
Thu, May/30/2024	25	May	2024	Thursday
Fri, May/31/2024	21	May	2024	Friday
Sat, Jun/01/2024	-	June	2024	Saturday
Sun, Jun/02/2024	-	June	2024	Sunday
Mon, Jun/03/2024	34	June	2024	Monday
Tue, Jun/04/2024	34	June	2024	Tuesday
Wed, Jun/05/2024	38	June	2024	Wednesday
Thu, Jun/06/2024	39	June	2024	Thursday
Fri, Jun/07/2024	24	June	2024	Friday
Sat, Jun/08/2024	-	June	2024	Saturday
Sun, Jun/09/2024	-	June	2024	Sunday
Mon, Jun/10/2024	22	June	2024	Monday
Tue, Jun/11/2024	51	June	2024	Tuesday
Wed, Jun/12/2024	44	June	2024	Wednesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Thu, Jun/13/2024	40	June	2024	Thursday
Fri, Jun/14/2024	19	June	2024	Friday
Sat, Jun/15/2024	-	June	2024	Saturday
Sun, Jun/16/2024	-	June	2024	Sunday
Mon, Jun/17/2024	40	June	2024	Monday
Tue, Jun/18/2024	23	June	2024	Tuesday
Wed, Jun/19/2024	29	June	2024	Wednesday
Thu, Jun/20/2024	38	June	2024	Thursday
Fri, Jun/21/2024	28	June	2024	Friday
Sat, Jun/22/2024	-	June	2024	Saturday
Sun, Jun/23/2024	-	June	2024	Sunday
Mon, Jun/24/2024	25	June	2024	Monday
Tue, Jun/25/2024	22	June	2024	Tuesday
Wed, Jun/26/2024	35	June	2024	Wednesday
Thu, Jun/27/2024	30	June	2024	Thursday
Fri, Jun/28/2024	30	June	2024	Friday
Sat, Jun/29/2024	-	June	2024	Saturday
Sun, Jun/30/2024	-	June	2024	Sunday
Mon, Jul/01/2024	33	July	2024	Monday
Tue, Jul/02/2024	43	July	2024	Tuesday
Wed, Jul/03/2024	-	July	2024	Wednesday
Thu, Jul/04/2024	-	July	2024	Thursday
Fri, Jul/05/2024	-	July	2024	Friday
Sat, Jul/06/2024	-	July	2024	Saturday
Sun, Jul/07/2024	-	July	2024	Sunday
Mon, Jul/08/2024	27	July	2024	Monday
Tue, Jul/09/2024	25	July	2024	Tuesday
Wed, Jul/10/2024	33	July	2024	Wednesday
Thu, Jul/11/2024	38	July	2024	Thursday
Fri, Jul/12/2024	20	July	2024	Friday
Sat, Jul/13/2024	-	July	2024	Saturday
Sun, Jul/14/2024	-	July	2024	Sunday
Mon, Jul/15/2024	27	July	2024	Monday
Tue, Jul/16/2024	24	July	2024	Tuesday
Wed, Jul/17/2024	16	July	2024	Wednesday
Thu, Jul/18/2024	14	July	2024	Thursday
Fri, Jul/19/2024	13	July	2024	Friday
Sat, Jul/20/2024	-	July	2024	Saturday
Sun, Jul/21/2024	-	July	2024	Sunday
Mon, Jul/22/2024	23	July	2024	Monday
Tue, Jul/23/2024	26	July	2024	Tuesday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Wed, Jul/24/2024	27	July	2024	Wednesday
Thu, Jul/25/2024	21	July	2024	Thursday
Fri, Jul/26/2024	18	July	2024	Friday
Sat, Jul/27/2024	-	July	2024	Saturday
Sun, Jul/28/2024	-	July	2024	Sunday
Mon, Jul/29/2024	42	July	2024	Monday
Tue, Jul/30/2024	19	July	2024	Tuesday
Wed, Jul/31/2024	28	July	2024	Wednesday
Thu, Aug/01/2024	32	August	2024	Thursday
Fri, Aug/02/2024	41	August	2024	Friday
Sat, Aug/03/2024	-	August	2024	Saturday
Sun, Aug/04/2024	-	August	2024	Sunday
Mon, Aug/05/2024	31	August	2024	Monday
Tue, Aug/06/2024	19	August	2024	Tuesday
Wed, Aug/07/2024	10	August	2024	Wednesday
Thu, Aug/08/2024	38	August	2024	Thursday
Fri, Aug/09/2024	14	August	2024	Friday
Sat, Aug/10/2024	-	August	2024	Saturday
Sun, Aug/11/2024	-	August	2024	Sunday
Mon, Aug/12/2024	38	August	2024	Monday
Tue, Aug/13/2024	20	August	2024	Tuesday
Wed, Aug/14/2024	25	August	2024	Wednesday
Thu, Aug/15/2024	25	August	2024	Thursday
Fri, Aug/16/2024	14	August	2024	Friday
Sat, Aug/17/2024	-	August	2024	Saturday
Sun, Aug/18/2024	-	August	2024	Sunday
Mon, Aug/19/2024	28	August	2024	Monday
Tue, Aug/20/2024	38	August	2024	Tuesday
Wed, Aug/21/2024	31	August	2024	Wednesday
Thu, Aug/22/2024	39	August	2024	Thursday
Fri, Aug/23/2024	-	August	2024	Friday
Sat, Aug/24/2024	-	August	2024	Saturday
Sun, Aug/25/2024	-	August	2024	Sunday
Mon, Aug/26/2024	38	August	2024	Monday
Tue, Aug/27/2024	20	August	2024	Tuesday
Wed, Aug/28/2024	20	August	2024	Wednesday
Thu, Aug/29/2024	32	August	2024	Thursday
Fri, Aug/30/2024	24	August	2024	Friday
Sat, Aug/31/2024	-	August	2024	Saturday
Sun, Sep/01/2024	-	September	2024	Sunday
Mon, Sep/02/2024	-	September	2024	Monday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Tue, Sep/03/2024	30	September	2024	Tuesday
Wed, Sep/04/2024	32	September	2024	Wednesday
Thu, Sep/05/2024	22	September	2024	Thursday
Fri, Sep/06/2024	41	September	2024	Friday
Sat, Sep/07/2024	-	September	2024	Saturday
Sun, Sep/08/2024	-	September	2024	Sunday
Mon, Sep/09/2024	18	September	2024	Monday
Tue, Sep/10/2024	22	September	2024	Tuesday
Wed, Sep/11/2024	43	September	2024	Wednesday
Thu, Sep/12/2024	37	September	2024	Thursday
Fri, Sep/13/2024	39	September	2024	Friday
Sat, Sep/14/2024	-	September	2024	Saturday
Sun, Sep/15/2024	-	September	2024	Sunday
Mon, Sep/16/2024	49	September	2024	Monday
Tue, Sep/17/2024	38	September	2024	Tuesday
Wed, Sep/18/2024	27	September	2024	Wednesday
Thu, Sep/19/2024	36	September	2024	Thursday
Fri, Sep/20/2024	40	September	2024	Friday
Sat, Sep/21/2024	-	September	2024	Saturday
Sun, Sep/22/2024	-	September	2024	Sunday
Mon, Sep/23/2024	33	September	2024	Monday
Tue, Sep/24/2024	20	September	2024	Tuesday
Wed, Sep/25/2024	31	September	2024	Wednesday
Thu, Sep/26/2024	50	September	2024	Thursday
Fri, Sep/27/2024	29	September	2024	Friday
Sat, Sep/28/2024	-	September	2024	Saturday
Sun, Sep/29/2024	-	September	2024	Sunday
Mon, Sep/30/2024	44	September	2024	Monday
Tue, Oct/01/2024	32	October	2024	Tuesday
Wed, Oct/02/2024	36	October	2024	Wednesday
Thu, Oct/03/2024	40	October	2024	Thursday
Fri, Oct/04/2024	44	October	2024	Friday
Sat, Oct/05/2024	-	October	2024	Saturday
Sun, Oct/06/2024	-	October	2024	Sunday
Mon, Oct/07/2024	45	October	2024	Monday
Tue, Oct/08/2024	23	October	2024	Tuesday
Wed, Oct/09/2024	43	October	2024	Wednesday
Thu, Oct/10/2024	27	October	2024	Thursday
Fri, Oct/11/2024	37	October	2024	Friday
Sat, Oct/12/2024	-	October	2024	Saturday
Sun, Oct/13/2024	-	October	2024	Sunday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Mon, Oct/14/2024	30	October	2024	Monday
Tue, Oct/15/2024	34	October	2024	Tuesday
Wed, Oct/16/2024	27	October	2024	Wednesday
Thu, Oct/17/2024	36	October	2024	Thursday
Fri, Oct/18/2024	24	October	2024	Friday
Sat, Oct/19/2024	-	October	2024	Saturday
Sun, Oct/20/2024	-	October	2024	Sunday
Mon, Oct/21/2024	36	October	2024	Monday
Tue, Oct/22/2024	20	October	2024	Tuesday
Wed, Oct/23/2024	38	October	2024	Wednesday
Thu, Oct/24/2024	37	October	2024	Thursday
Fri, Oct/25/2024	32	October	2024	Friday
Sat, Oct/26/2024	-	October	2024	Saturday
Sun, Oct/27/2024	-	October	2024	Sunday
Mon, Oct/28/2024	49	October	2024	Monday
Tue, Oct/29/2024	28	October	2024	Tuesday
Wed, Oct/30/2024	43	October	2024	Wednesday
Thu, Oct/31/2024	29	October	2024	Thursday
Fri, Nov/01/2024	37	November	2024	Friday
Sat, Nov/02/2024	-	November	2024	Saturday
Sun, Nov/03/2024	-	November	2024	Sunday
Mon, Nov/04/2024	61	November	2024	Monday
Tue, Nov/05/2024	31	November	2024	Tuesday
Wed, Nov/06/2024	-	November	2024	Wednesday
Thu, Nov/07/2024	38	November	2024	Thursday
Fri, Nov/08/2024	44	November	2024	Friday
Sat, Nov/09/2024	-	November	2024	Saturday
Sun, Nov/10/2024	-	November	2024	Sunday
Mon, Nov/11/2024	19	November	2024	Monday
Tue, Nov/12/2024	31	November	2024	Tuesday
Wed, Nov/13/2024	47	November	2024	Wednesday
Thu, Nov/14/2024	45	November	2024	Thursday
Fri, Nov/15/2024	68	November	2024	Friday
Sat, Nov/16/2024	-	November	2024	Saturday
Sun, Nov/17/2024	-	November	2024	Sunday
Mon, Nov/18/2024	28	November	2024	Monday
Tue, Nov/19/2024	40	November	2024	Tuesday
Wed, Nov/20/2024	29	November	2024	Wednesday
Thu, Nov/21/2024	35	November	2024	Thursday
Fri, Nov/22/2024	9	November	2024	Friday
Sat, Nov/23/2024	-	November	2024	Saturday

ROUND-TRIP TRUCK TRIPS (2020-2024
Pier 92 - Martin Marietta Marine Aggregates Plant

Sun, Nov/24/2024	-	November	2024	Sunday
Mon, Nov/25/2024	22	November	2024	Monday
Tue, Nov/26/2024	41	November	2024	Tuesday
Wed, Nov/27/2024	36	November	2024	Wednesday
Thu, Nov/28/2024	-	November	2024	Thursday
Fri, Nov/29/2024	-	November	2024	Friday
Sat, Nov/30/2024	-	November	2024	Saturday
Sun, Dec/01/2024	-	December	2024	Sunday
Mon, Dec/02/2024	27	December	2024	Monday
Tue, Dec/03/2024	34	December	2024	Tuesday
Wed, Dec/04/2024	37	December	2024	Wednesday
Thu, Dec/05/2024	34	December	2024	Thursday
Fri, Dec/06/2024	25	December	2024	Friday
Sat, Dec/07/2024	-	December	2024	Saturday
Sun, Dec/08/2024	-	December	2024	Sunday
Mon, Dec/09/2024	32	December	2024	Monday
Tue, Dec/10/2024	47	December	2024	Tuesday
Wed, Dec/11/2024	80	December	2024	Wednesday
Thu, Dec/12/2024	50	December	2024	Thursday
Fri, Dec/13/2024	32	December	2024	Friday
Sat, Dec/14/2024	21	December	2024	Saturday
Sun, Dec/15/2024	-	December	2024	Sunday
Mon, Dec/16/2024	16	December	2024	Monday
Tue, Dec/17/2024	11	December	2024	Tuesday
Wed, Dec/18/2024	32	December	2024	Wednesday
Thu, Dec/19/2024	23	December	2024	Thursday
Fri, Dec/20/2024	80	December	2024	Friday
Sat, Dec/21/2024	-	December	2024	Saturday
Sun, Dec/22/2024	-	December	2024	Sunday
Mon, Dec/23/2024	62	December	2024	Monday
Tue, Dec/24/2024	-	December	2024	Tuesday
Wed, Dec/25/2024	-	December	2024	Wednesday
Thu, Dec/26/2024	84	December	2024	Thursday
Fri, Dec/27/2024	48	December	2024	Friday
Sat, Dec/28/2024	-	December	2024	Saturday
Sun, Dec/29/2024	-	December	2024	Sunday
Mon, Dec/30/2024	17	December	2024	Monday
Tue, Dec/31/2024	12	December	2024	Tuesday

APPENDIX C
TRUCK LENGTH OF TRAVEL

Port of SF Pier 92 Modernization and Plant Replacement Project
Daily Round Trip Trucks and Trip Lengths by Analysis Scenario and Delivery Location

	Existing Counts (1)			Existing Baseline for EIR (2)			Project - Reasonable Peak (3)			Project - Maximum (4)		
Sand Deliveries	**tons**	**trucks**	**%**	**tons**	**trucks**	**%**	**tons**	**trucks**	**%**	**tons**	**trucks**	**%**
Concrete Plants (5)	404	18	65%	1,017	44	65%	3,000	130	54%	3,000	130	43%
Direct Deliveries (6)	217	9	35%	547	24	35%	2,520	110	46%	3,900	170	57%
total	621	27	100%	1,564	68	100%	5,520	240	100%	6,900	300	100%
No. of truck loading hours (7)	8			8 to 10			20			24		
Tons per truck assumption (8)	23			23			23			23		
	one-way	**distance**		**one-way**	**distance**		**one-way**	**distance**		**one-way**	**distance**	
Weighted Avg. Trip Length (9)	**miles**	**x trucks**		**miles**	**x trucks**		**miles**	**x trucks**		**miles**	**x trucks**	
Concrete Plants	0.17	3.0		0.17	7.5		0.17	22.2		0.17	22.2	
Direct Deliveries	4.53	42.8		4.53	107.8		4.53	496.3		4.53	768.1	
subtotal		45.8			115.3			518.5			790.3	
One-way avg. miles per truck (10)		1.7			1.7			2.2			2.6	
Round trip avg. miles per truck (11)		**3.4**			**3.4**			**4.3**			**5.3**	

Source: Adavant Consulting/LCW Consulting, July 2025.

Notes:

1. Existing counts from field surveys of truck activity at project site driveways on April 23rd and 24th, 2025.
2. Existing baseline represents the value that encompasses 2/3 of the cases for the five-year period between January 1, 2020 and December 31, 2024.
3. Project - Reasonable Peak assumes expansion of truck loading hours to 20 hours, and that processing of trucks within site remains at a minimum of 5 minutes per truck. Amount of sand accepted at the adjacent concrete plants maxes out at 3,000 tons per day (per project team discussion with Michael Bishop on 6/10/2025).
4. Project - Maximum assumes expansion of truck loading hours to 24 hours, with additional measures implemented to process a maximum of 300 trucks per day. 300 trucks per day from BAAQMD Authorization to Construct Application, March 2024.
5. Deliveries to Concrete Plants along Amador Street.
6. Direct Deliveries to projects identified in Pier 92 Modernization and Plant Replacement Project Application Summary, March 29, 2024, pp. 5 and 6.
7. Number of truck loading hours: Existing counts based on observed operation (trucks between 6 a.m. and 2 p.m.), Existing Baseline assumes that operation may be expanded (up to 96 trucks can be accommodated within 8 hours at 5 minutes per truck), Project - Reasonable Peak assumes that hours of loading operation would be expanded to accommodate higher demand, Project - Maximum assumes operation 24-hours a day in order to accommodate 300 daily trucks.
8. Average sand load on trucks leaving the site assumed to be 23 tons per truck - per discussion with Michael Bishop during pre-data collection field visit.
9. Weighted Average Trip Length was calculated based on the estimated number of trucks destined to adjacent concrete plants versus direct deliveries of sand to projects. Average one-way trip lengths rounded to two decimal places and lengths assumed to remain constant for all analysis scenarios.
10. One-way average miles per truck was calculted by dividing the "distance x trucks" subtotal by the number of daily trucks. Values rounded to one decimal place.
11. Round trip average miles per truck was calculated by multiplying the one-way average miles per truck by two to account for inbound to site and outbound from site trip. Value rounded to one decimal place.

Port of SF Pier 92 Modernization and Plant Replacement Project
One-Way Travel Trip Lengths for Sand Trucks

Representative Sand Deliveries	**Routes or *location assumed***	**Miles to Pier 92**
Concrete Plants (representative)		0.17
Direct Deliveries		
Hunters Point Shipyard	*Innes and Donahue using south route*	1.6
South Ocean Beach	via I-280	11.0
Herons Head	using south route	0.6
Utility Projects	*Market/19th via Cesar Chavez*	5.2
Housing in Haight-Ashbury	*Masonic/Haight via 101 and Octavia Blvd*	5.8
SEP Biosolids Digester	via Cargo, Quint, Davidson	1.1
Life Sciences in South San Francisco	*Gateway Blvd/Oyster Pt Blvd*	7.8
Mixed-Use in SoMa	*Fourth/Folsom*	3.6
Kelsey Civic Center	via U.S. 101	4.3
30 Van Ness	via U.S. 101	4.3
average		*4.53*

Source: Adavant Consulting/LCW Consulting, July 2025.

Notes:
1. Representative distance for concrete plants between project site exit driveway and CEMEX main entrance driveway.
2. Direct Deliveries to projects identified in Pier 92 Modernization and Plant Replacement Project Application Summary, March 29, 2024, pp. 5 and 6.
3. Distances calculated between Martin Marietta Pier 92 facilities and projects using Google Earth Pro.
4. Rounded to one decimal place.

Pier 92 Sand Processing Facility – Traffic Management Measures

Traffic Management Measures	150-240 daily trucks	240 – 300 daily trucks
Expanding hours of operation from current 10-hour period	√	√
Greater use of scheduling of truck arrivals	√	√
Adding a second loader during peak demand periods (i.e., add new loading lane inside the facility)	√	√
Adding personnel to assist truck drivers and loaders within the facility	--	√
Assigning flaggers to control traffic along Amador Street to direct and facilitate incoming and/or exiting truck maneuvers	--	√
Assign a staging area to enhance truck arrival schedule	--	√

SOURCE: Martin Marietta, October 2025.

Notes:

1. No changes to current operating procedures or operating hours (10 hours between 6 a.m. and 3 p.m.) assumed to be required for fewer than 150 trucks per day.
2. Measures that could be implemented when the number of daily trucks exceed 150 trucks within the current 10-hour operating period based on current practice.

APPENDIX E
BIOLOGICAL RESOURCES SUPPORTING INFORMATION

CALIFORNIA DEPARTMENT OF FISH and WILDLIFE **RareFind**

Query Summary:
BIOS Selection

Print Close

CNDDB Element Query Results

Scientific Name	Common Name	Taxonomic Group	Element Code	Total Occs	Returned Occs	Federal Status	State Status	Global Rank	State Rank	CA Rare Plant Rank	Other Status	Habitats
Acipenser medirostris pop. 1	green sturgeon - southern DPS	Fish	AFCAA01031	14	1	Threatened	None	G2T1	S1	null	AFS_VU-Vulnerable, CDFW_SSC-Species of Special Concern, IUCN_EN-Endangered	Aquatic, Estuary, Marine bay, Sacramento/San Joaquin flowing waters
Astragalus tener var. tener	alkali milk-vetch	Dicots	PDFAB0F8R1	65	1	None	None	G2T1	S1	1B.2	SB_UCSC-UC Santa Cruz	Alkali playa, Valley & foothill grassland, Vernal pool, Wetland
Carex comosa	bristly sedge	Monocots	PMCYP032Y0	31	1	None	None	G5	S2	2B.1	IUCN_LC-Least Concern	Coastal prairie, Freshwater marsh, Marsh & swamp, Valley & foothill grassland, Wetland
Cicindela hirticollis gravida	sandy beach tiger beetle	Insects	IICOL02101	34	1	None	None	G5T2	S2	null	null	Coastal dunes
Collinsia multicolor	San Francisco collinsia	Dicots	PDSCR0H0B0	36	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_UCSC-UC Santa Cruz	Closed-cone coniferous forest, Coastal scrub, Ultramafic
Falco peregrinus anatum	American peregrine falcon	Birds	ABNKD06071	77	2	Delisted	Delisted	G4T4	S3S4	null	CDF_S-Sensitive	null
Fritillaria liliacea	fragrant fritillary	Monocots	PMLIL0V0C0	82	2	None	None	G2	S2	1B.2	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, USFS_S-Sensitive	Cismontane woodland, Coastal prairie, Coastal scrub, Ultramafic, Valley & foothill grassland
Helianthella castanea	Diablo helianthella	Dicots	PDAST4M020	107	1	None	None	G2	S2	1B.2	BLM_S-Sensitive, SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Broadleaved upland forest, Chaparral, Cismontane woodland, Coastal scrub, Valley & foothill grassland
Hemizonia congesta ssp. congesta	congested-headed hayfield tarplant	Dicots	PDAST4R0W1	52	1	None	None	G5T2	S2	1B.2	SB_UCBG-UC Botanical Garden at Berkeley	Valley & foothill grassland
Heteranthera dubia	water star-grass	Monocots	PMPON03010	9	1	None	None	G5	S2	2B.2	IUCN_LC-Least Concern	Marsh & swamp
Icaricia icarioides missionensis	Mission blue butterfly	Insects	IILEPG801A	14	1	Endangered	None	G5T2	S2	null	null	Coastal prairie
Lasiurus cinereus	hoary bat	Mammals	AMACC05032	238	1	None	None	G3G4	S4	null	IUCN_LC-Least Concern	Broadleaved upland forest, Cismontane woodland, Lower montane coniferous forest, North coast coniferous forest

Layia carnosa	beach layia	Dicots	PDAST5N010	25	1	Threatened	Endangered	G2	S2	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden, SB_SBBG-Santa Barbara Botanic Garden	Coastal dunes, Coastal scrub
Leptosiphon rosaceus	rose leptosiphon	Dicots	PDPLM09180	31	1	None	None	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Coastal bluff scrub
Rallus obsoletus obsoletus	California Ridgway's rail	Birds	ABNME05011	99	1	Endangered	Endangered	G3T1	S2	null	CDFW_FP-Fully Protected	Brackish marsh, Marsh & swamp, Salt marsh, Wetland
Sanicula maritima	adobe sanicle	Dicots	PDAPI1Z0D0	17	1	None	Rare	G2	S2	1B.1	SB_SBBG-Santa Barbara Botanic Garden, USFS_S-Sensitive	Chaparral, Coastal prairie, Meadow & seep, Ultramafic, Valley & foothill grassland
Silene scouleri ssp. scouleri	Scouler's catchfly	Dicots	PDCAR0U1MC	23	1	None	None	G5T4T5	S2S3	2B.2	null	Coastal bluff scrub, Coastal prairie, Valley & foothill grassland
Spirinchus thaleichthys pop. 2	longfin smelt - San Francisco Bay-Delta DPS	Fish	AFCHB03040	35	2	Endangered	Threatened	G5TNRQ	S1	null	IUCN_LC-Least Concern	Aquatic, Estuary, Marine bay, Sacramento/San Joaquin flowing waters
Suaeda californica	California seablite	Dicots	PDCHE0P020	18	3	Endangered	None	G1	S1	1B.1	SB_CalBG/RSABG-California/Rancho Santa Ana Botanic Garden	Freshwater marsh, Marsh & swamp, Wetland
Thamnophis sirtalis tetrataenia	San Francisco gartersnake	Reptiles	ARADB3613B	66	7	Endangered	Endangered	G5T2Q	S2	null	CDFW_FP-Fully Protected	Artificial standing waters, Marsh & swamp, Sacramento/San Joaquin standing waters, Wetland
Triphysaria floribunda	San Francisco owl's-clover	Dicots	PDSCR2T010	50	3	None	None	G2?	S2?	1B.2	null	Coastal prairie, Coastal scrub, Ultramafic, Valley & foothill grassland

CNPS Rare Plant Inventory

Search Results

66 matches found. Click on scientific name for details

Search Criteria: , Quad is one of [3712274:3712264]

▲ SCIENTIFIC NAME	COMMON NAME	FAMILY	LIFEFORM	BLOOMING PERIOD	FED LIST	STATE LIST	GLOBAL RANK	STATE RANK	CA RARE PLANT RANK	CA ENDEMIC	DATE ADDED	PHOTO
Allium peninsulare var. *franciscanum*	Franciscan onion	Alliaceae	perennial bulbiferous herb	(Apr)May-Jun	None	None	G4G5T2	S2	1B.2	Yes	2001-01-01	 © 2019 Aaron Arthur
Amsinckia lunaris	bent-flowered fiddleneck	Boraginaceae	annual herb	Mar-Jun	None	None	G3	S3	1B.2	Yes	1974-01-01	 © 2011 Neal Kramer
Aphyllon robbinsii	Robbins' broomrape	Orobanchaceae	annual herb (achlorophyllous)	Apr-Jul	None	None	G1	S1	1B.1	Yes	2023-03-28	 © 2017 Dylan Neubauer
Arabis blepharophylla	coast rockcress	Brassicaceae	perennial herb	Feb-May	None	None	G4	S4	4.3	Yes	1974-01-01	 © 2011 Neal Kramer
Arctostaphylos franciscana	Franciscan manzanita	Ericaceae	perennial evergreen shrub	Feb-Apr	FE	None	GHC	S1	1B.1	Yes	1974-01-01	 © 2015 Neal Kramer

Arctostaphylos imbricata	San Bruno Mountain manzanita	Ericaceae	perennial evergreen shrub	Feb-May	None	CE	G1	S1	1B.1	Yes	1974-01-01	 © 2013 Robert Sikora
Arctostaphylos montana ssp. *ravenii*	Presidio manzanita	Ericaceae	perennial evergreen shrub	Feb-Mar	FE	CE	G3T1	S1	1B.1	Yes	1980-01-01	 © 2019 Susan McDougall
Arctostaphylos montaraensis	Montara manzanita	Ericaceae	perennial evergreen shrub	Jan-Mar	None	None	G1	S1	1B.2	Yes	1974-01-01	 © 2016 Neal Kramer
Arctostaphylos pacifica	Pacific manzanita	Ericaceae	evergreen shrub	Feb-Apr	None	CE	G1	S1	1B.1	Yes	1974-01-01	 Aaron Schusteff
Arenaria paludicola	marsh sandwort	Caryophyllaceae	perennial stoloniferous herb	May-Aug	FE	CE	G1	S1	1B.1		1984-01-01	No Photo Available
Aspidotis carlotta-halliae	Carlotta Hall's lace fern	Pteridaceae	perennial rhizomatous herb	Jan-Dec	None	None	G3	S3	4.2	Yes	1994-01-01	No Photo Available
Astragalus nuttallii var. *nuttallii*	ocean bluff milk-vetch	Fabaceae	perennial herb	Jan-Nov	None	None	G4T4	S4	4.3	Yes	2001-01-01	 Robert Preston
Astragalus tener var. *tener*	alkali milk-vetch	Fabaceae	annual herb	Mar-Jun	None	None	G2T1	S1	1B.2	Yes	1994-01-01	No Photo Available
Carex comosa	bristly sedge	Cyperaceae	perennial rhizomatous herb	May-Sep	None	None	G5	S2	2B.1		1994-01-01	 Dean Wm. Taylor 1997
Carex praticola	northern meadow sedge	Cyperaceae	perennial herb	May-Jul	None	None	G5	S2	2B.2		1984-01-01	 ©2013 Scot Loring

Castilleja ambigua var. *ambigua*	johnny-nip	Orobanchaceae	annual herb (hemiparasitic)	Mar-Aug	None	None	G5T4	S3S4	4.2		2009-02-04	 ©2011 Dylan Neubauer
Centromadia parryi ssp. *parryi*	pappose tarplant	Asteraceae	annual herb	May-Nov	None	None	G3T2	S2	1B.2	Yes	2004-01-01	 © 2016 John Doyen
Chloropyron maritimum ssp. *palustre*	Point Reyes salty bird's-beak	Orobanchaceae	annual herb (hemiparasitic)	Jun-Oct	None	None	G4?T2	S2	1B.2		1974-01-01	 ©2017 John Doyen
Chorizanthe cuspidata var. *cuspidata*	San Francisco Bay spineflower	Polygonaceae	annual herb	Apr-Jul(Aug)	None	None	G2T1	S1	1B.2	Yes	1994-01-01	No Photo Available
Chorizanthe robusta var. *robusta*	robust spineflower	Polygonaceae	annual herb	Apr-Sep	FE	None	G2T1	S1	1B.1	Yes	1980-01-01	No Photo Available
Cirsium andrewsii	Franciscan thistle	Asteraceae	perennial herb	Mar-Jul	None	None	G3	S3	1B.2	Yes	1974-01-01	No Photo Available
Cirsium hydrophilum var. *vaseyi*	Mt. Tamalpais thistle	Asteraceae	perennial herb	May-Aug	None	None	G2T2	S2	1B.2	Yes	1974-01-01	No Photo Available
Cirsium occidentale var. *compactum*	compact cobwebby thistle	Asteraceae	perennial herb	Apr-Jun	None	None	G3G4T2	S2	1B.2	Yes	1974-01-01	No Photo Available
Clarkia franciscana	Presidio clarkia	Onagraceae	annual herb	May-Jul	FE	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Collinsia corymbosa	round-headed collinsia	Plantaginaceae	annual herb	Apr-Jun	None	None	G1	S1	1B.2	Yes	1994-01-01	 ©2007 Steve Matson
Collinsia multicolor	San Francisco collinsia	Plantaginaceae	annual herb	(Feb)Mar-May	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Equisetum palustre	marsh horsetail	Equisetaceae	perennial rhizomatous herb	Unk	None	None	G5	S1S3	3		1994-01-01	No Photo Available

Erysimum franciscanum	San Francisco wallflower	Brassicaceae	perennial herb	Mar-Jun	None	None	G3	S3	4.2	Yes	1974-01-01	No Photo Available
Fritillaria liliacea	fragrant fritillary	Liliaceae	perennial bulbiferous herb	Feb-Apr	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2004 Carol W. Witham
Gilia capitata ssp. *chamissonis*	blue coast gilia	Polemoniaceae	annual herb	Apr-Jul	None	None	G5T2	S2	1B.1	Yes	2001-01-01	 © 2017 John Doyen
Gilia millefoliata	dark-eyed gilia	Polemoniaceae	annual herb	Apr-Jul	None	None	G2	S2	1B.2		2001-01-01	 © 2017 John Doyen
Grindelia hirsutula var. *maritima*	San Francisco gumplant	Asteraceae	perennial herb	Jun-Sep	None	None	G5T1Q	S1	3.2	Yes	1974-01-01	 Robert Potts © 2001 California Academy of Sciences
Helianthella castanea	Diablo helianthella	Asteraceae	perennial herb	Mar-Jun	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2013 Christopher Bronny
Hemizonia congesta ssp. *congesta*	congested-headed hayfield tarplant	Asteraceae	annual herb	Apr-Nov	None	None	G5T2	S2	1B.2	Yes	1988-01-01	 © 2015 Vernon Smith
Hesperevax sparsiflora var. *brevifolia*	short-leaved evax	Asteraceae	annual herb	Mar-Jun	None	None	G4T3	S3	1B.2		1994-01-01	 © 2006 Doreen L. Smith

Hesperolinon congestum	Marin western flax	Linaceae	annual herb	Apr-Jul	FT	CT	G1	S1	1B.1	Yes	1974-01-01	 © 2009 Neal Kramer
Heteranthera dubia	water star-grass	Pontederiaceae	perennial herb (aquatic)	Jul-Oct	None	None	G5	S2	2B.2		2013-10-10	 ©2010 Louis-M. Landry
Horkelia cuneata var. *sericea*	Kellogg's horkelia	Rosaceae	perennial herb	Apr-Sep	None	None	G4T1?	S1?	1B.1	Yes	1988-01-01	 © 2018 Neal Kramer
Horkelia marinensis	Point Reyes horkelia	Rosaceae	perennial herb	May-Sep	None	None	G2	S2	1B.2	Yes	1974-01-01	 © 2017 John Doyen
Hosackia gracilis	harlequin lotus	Fabaceae	perennial rhizomatous herb	Mar-Jul	None	None	G3G4	S3	4.2		2004-01-01	 © 2023 Dylan Neubauer
Hypogymnia schizidiata	island tube lichen	Parmeliaceae	foliose lichen		None	None	G2G3	S2	1B.3		2014-03-01	No Photo Available
Iris longipetala	coast iris	Iridaceae	perennial rhizomatous herb	Mar-May(Jun)	None	None	G3	S3	4.2	Yes	2006-10-12	 © 2014 Aaron Schusteff
Layia carnosa	beach layia	Asteraceae	annual herb	Mar-Jul	FT	CE	G2	S2	1B.1		1988-01-01	 © 2007 Aaron Schusteff
Leptosiphon ambiguus	serpentine leptosiphon	Polemoniaceae	annual herb	Mar-Jun	None	None	G4	S4	4.2	Yes	1994-01-01	 © 2010 Aaron Schusteff

Leptosiphon grandiflorus	large-flowered leptosiphon	Polemoniaceae	annual herb	Apr-Aug	None	None	G3G4	S3S4	4.2	Yes	1994-01-01	 © 2003 Doreen L. Smith
Leptosiphon latisectus	broad-lobed leptosiphon	Polemoniaceae	annual herb	Apr-Jun	None	None	G4	S4	4.3	Yes	2001-01-01	 © 2015 Steve Matson
Leptosiphon rosaceus	rose leptosiphon	Polemoniaceae	annual herb	Apr-Jul	None	None	G1	S1	1B.1	Yes	2001-01-01	 © 2013 Aaron Schusteff
Lessingia germanorum	San Francisco lessingia	Asteraceae	annual herb	(Jun)Jul-Nov	FE	CE	G1	S1	1B.1	Yes	1980-01-01	 © 2019 Aaron Schusteff
Malacothamnus arcuatus var. *arcuatus*	arcuate bushmallow	Malvaceae	perennial deciduous shrub	Apr-Sep	None	None	G2Q	S2	1B.2	Yes	1974-01-01	 © 2017 Keir Morse
Micropus amphibolus	Mt. Diablo cottonweed	Asteraceae	annual herb	Mar-May	None	None	G3G4	S3S4	3.2	Yes	1974-01-01	 © 2008 Aaron Arthur
Microseris paludosa	marsh microseris	Asteraceae	perennial herb	Apr-Jun(Jul)	None	None	G2	S2	1B.2	Yes	2001-01-01	No Photo Available
Monardella sinuata ssp. *nigrescens*	northern curly-leaved monardella	Lamiaceae	annual herb	(Apr)May-Jul(Aug-Sep)	None	None	G3T2	S2	1B.2	Yes	2013-12-31	 © 2014 John Doyen
Pentachaeta bellidiflora	white-rayed pentachaeta	Asteraceae	annual herb	Mar-May	FE	CE	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Plagiobothrys chorisianus var. *chorisianus*	Choris' popcornflower	Boraginaceae	annual herb	Mar-Jun	None	None	G3T1Q	S1	1B.2	Yes	1984-01-01	No Photo Available

Plagiobothrys diffusus	San Francisco popcornflower	Boraginaceae	annual herb	Mar-Jun	None	CE	G1Q	S1	1B.1	Yes	1974-01-01	No Photo Available
Plagiobothrys glaber	hairless popcornflower	Boraginaceae	annual herb	Mar-May	None	None	GX	SX	1A	Yes	1974-01-01	No Photo Available
Polemonium carneum	Oregon polemonium	Polemoniaceae	perennial herb	Apr-Sep	None	None	G3G4	S2	2B.2		2008-11-03	 ©2018 John Doyen
Sanicula maritima	adobe sanicle	Apiaceae	perennial herb	Feb-May	None	CR	G2	S2	1B.1	Yes	1974-01-01	No Photo Available
Senecio aphanactis	chaparral ragwort	Asteraceae	annual herb	Jan-Apr(May)	None	None	G3	S2	1B.2		1994-01-01	 Neal Kramer
Silene scouleri ssp. *scouleri*	Scouler's catchfly	Caryophyllaceae	perennial herb	(Mar-May)Jun-Aug(Sep)	None	None	G5T4T5	S2S3	2B.2		2017-12-13	 ©2015 Vernon Smith
Silene verecunda ssp. *verecunda*	San Francisco campion	Caryophyllaceae	perennial herb	(Feb)Mar-Jul(Aug)	None	None	G5T1	S1	1B.2	Yes	1980-01-01	No Photo Available
Stebbinsoseris decipiens	Santa Cruz microseris	Asteraceae	annual herb	Apr-May	None	None	G2	S2	1B.2	Yes	1974-01-01	No Photo Available
Suaeda californica	California seablite	Chenopodiaceae	perennial evergreen shrub	Jul-Oct	FE	None	G1	S1	1B.1	Yes	1988-01-01	 © 2010 Chris Winchell
Trifolium amoenum	two-fork clover	Fabaceae	annual herb	Apr-Jun	FE	None	G1	S1	1B.1	Yes	1974-01-01	No Photo Available
Triphysaria floribunda	San Francisco owl's-clover	Orobanchaceae	annual herb	Apr-Jun	None	None	G2?	S2?	1B.2	Yes	1974-01-01	No Photo Available
Triquetrella californica	coastal triquetrella	Pottiaceae	moss		None	None	G2	S2	1B.2		2001-01-01	No Photo Available

Showing 1 to 66 of 66 entries

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Suggested Citation:

California Native Plant Society, Rare Plant Program. 2025. Rare Plant Inventory (online edition, v9.5.1). Website https://www.rareplants.cnps.org [accessed 29 August 2025].

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: 08/28/2025 18:43:07 UTC
Project Code: 2025-0142335
Project Name: Pier 92 Modernization and Plant Replacement Project

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)

(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

PROJECT SUMMARY

Project Code: 2025-0142335
Project Name: Pier 92 Modernization and Plant Replacement Project
Project Type: Disposal - Beneficial Use
Project Description: Modernization and Plant Replacement Project
Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.746399049999994,-122.37724235867779,14z



Counties: San Francisco County, California

ENDANGERED SPECIES ACT SPECIES

There is a total of 19 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Salt Marsh Harvest Mouse *Reithrodontomys raviventris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/613	Endangered

BIRDS

NAME	STATUS
California Least Tern *Sternula antillarum browni* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8104	Endangered
California Ridgway's Rail *Rallus obsoletus obsoletus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4240	Endangered
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened

REPTILES

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened
Northwestern Pond Turtle *Actinemys marmorata* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1111	Proposed Threatened
San Francisco Garter Snake *Thamnophis sirtalis tetrataenia* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5956	Endangered

AMPHIBIANS

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location does not overlap the critical habitat.	Threatened

NAME	STATUS

Species profile: https://ecos.fws.gov/ecp/species/2891

FISHES

NAME	STATUS
Longfin Smelt *Spirinchus thaleichthys* Population: San Francisco Bay-Delta DPS There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9011	Endangered
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9743	Proposed Threatened

FLOWERING PLANTS

NAME	STATUS
California Seablite *Suaeda californica* Population: No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6310	Endangered
Franciscan Manzanita *Arctostaphylos franciscana* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/5350	Endangered
Presidio Manzanita *Arctostaphylos hookeri var. ravenii* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7216	Endangered
Robust Spineflower *Chorizanthe robusta var. robusta* There is **final** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/9287	Endangered
San Francisco Lessingia *Lessingia germanorum (=L.g. var. germanorum)* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8174	Endangered
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered

NAME	STATUS
White-rayed Pentachaeta *Pentachaeta bellidiflora*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7782

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

IPAC USER CONTACT INFORMATION

Agency:	ICF
Name:	Ross Wilming
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APPENDIX F
GEOTECHNICAL REPORT

GEOTECHNICAL REPORT
PROPOSED SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

PROJECT NO.: 25000566.001A

AUGUST 27, 2024

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August 27, 2024
Project No.: 25000566.001A

Martin Marietta
3000 Executive Parkway, Suite 240
San Ramon, California 94583

Attention: Mr. Kumar Singh
Regional Project Manager

SUBJECT: Geotechnical Report
Proposed Sand Processing Plant, Pier 92
San Francisco, California

Dear Mr. Singh:

Submitted here is Kleinfelder's report of a geotechnical study for the proposed new sand processing plant at Pier 92, in San Francisco, California. The report presents the results of our field investigation and laboratory testing for the project, and our conclusions and recommendations pertaining to geotechnical design and construction. This study was performed under the terms of our contract with Martin Marietta dated April 30, 2024, and our proposal dated March 8, 2024.

Based on the results of our field investigation, we judge that shallow foundations are sufficient to support the new tent building if the estimated settlements described in this report are tolerable. Otherwise, deep foundations to dense Older Sediments underlying weak, compressible Young Bay Mud will be required to support the proposed structural loads and mitigate potential settlement. In addition, the site will continue to settle under the existing fills loads and new construction-related fill, or aggregate stockpiles.

The conclusions and recommendations presented in this report are based on data from limited subsurface exploration. Variations between anticipated and actual soil and bedrock conditions may be encountered. Kleinfelder should observe the soil conditions exposed during construction to look for variations in subsurface conditions that may require modifications to our conclusions or recommendations.

Additionally, pre-final project plans and specifications should be reviewed by our office to verify conformance with the general intent of the recommendations presented in this report.

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We appreciate the opportunity to provide geotechnical engineering services on this project. Should you have any questions, please contact the undersigned.

Respectfully submitted,

KLEINFELDER, INC.

Aryan Noroozi, EIT
Staff Professional

Renie Gee, PE
Senior Engineer



Mark D. Fuhriman, PE, GE
Senior Principal Geotechnical Engineer

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1 INTRODUCTION

1.1 GENERAL

Kleinfelder has conducted a geotechnical study to support the design and construction planning of the proposed new sand processing plant within the existing sand processing plant operations at Pier 92 at the Port of San Francisco, California. A project vicinity map is shown on Figure 1.

The conclusions and recommendations presented in this report are based on the results of a site reconnaissance, mapped geologic information, subsurface exploration, geotechnical laboratory testing, and Kleinfelder's experience with similar projects. The recommendations contained in this report are subject to the provisions and requirements outlined in the Limitations section of this report.

1.2 PROJECT DESCRIPTION

Pier 92 is located at the north end of Amador Street in the Central Waterfront district, east of the India Basin district, of San Francisco. The project area occupies a portion of Pier 92 that consists of land that was reclaimed between the early to mid-1960s through the mid-1970s by constructing an underwater perimeter dike and filling behind it with dredged soils consisting of dredged soft clay (Young Bay Mud) and debris fill.

Based on the provided "Covered Storage with Gantry Site Plan," prepared by Martin Marietta and dated December 18, 2023, the new plant components include an oversize handling area, clarifier, screws and dewatering screens, a thickener, feeder, conveyors, a 30,800-square-foot tent building, a 9,500-ton product pile, a 35,000-ton raw pile, and appurtenant structures including a wheel wash and scale facilities. Based on dimensions provided on the Covered Storage with Gantry Site Plan, anticipated contact pressures under the 35,000-ton raw pile and the 9,500-ton product pile will be about 3,400 pounds per square foot (psf) and 1,400 psf, respectively. These components are shown on the site plan on Figure 2. New pavements will likely be asphalt concrete. The new equipment and tent building are expected to be supported on shallow foundations. No wharf or pier structures will be included in this project.

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1.3 PURPOSE AND SCOPE OF SERVICES

The purpose of this study is to explore and characterize subsurface conditions at the site and to provide geotechnical recommendations for the design and construction of the project. Kleinfelder's services were performed in general accordance with our proposal dated March 8, 2024. Kleinfelder's scope of services includes the following the following:

- Review pertinent available existing geotechnical literature and published geologic information and conduct a geologic site reconnaissance.
- Drill one boring at the site to explore subsurface conditions and obtain samples for laboratory testing.
- Laboratory testing on selected samples obtained from the boring to evaluate pertinent geotechnical properties.
- Engineering analyses to develop geotechnical conclusions.
- Preparation of this report.

Environmental analyses and evaluations are outside the scope of this study. Mapping of existing underground utilities is also outside the scope of this study.

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2 FIELD EXPLORATION

One boring (B-1) was drilled at the location shown on Figure 2 to explore subsurface conditions and obtain soil samples for laboratory testing. The boring location was estimated in the field by measuring from existing landmarks and was not surveyed. The boring was drilled from June 24 through June 27, 2024, by Pitcher Drilling, LLC, of East Palo Alto, California. A log of the boring is provided in Appendix A of this report. Prior to drilling, Kleinfelder obtained a building permit from the Port of San Francisco and a drilling permit from the City and County of San Francisco Department of Public Health, Environmental Health Branch.

2.1 UNDERGROUND UTILITY CLEARANCE

Kleinfelder contacted Underground Service Alert (USA) prior to drilling to mark the locations of underground utilities in the public right of way. The boring location was selected in consultation with plant operations personnel to avoid operational conflicts and existing stockpiled materials.

2.2 DRILLING AND SAMPLING METHODS

Boring B-1 was drilled using a hand auger in the upper 5 feet and then solid flight auger drilling methods with a truck-mounted drill rig to a depth of approximately 10 feet when groundwater was first encountered. Drilling was halted for about 45 minutes for periodic depth-to-water measurements. Mud rotary drilling methods were then used to a completion depth of approximately 301½ feet.

A bulk sample from the upper 5 feet was collected and stored in a plastic bag. Below a depth of 5 feet samples were typically collected at approximate 2.5-foot intervals in the upper 25 feet, 5-foot intervals in the upper 55 feet, and 10-foot intervals to completion depth by driving either a 2-inch outside diameter (O.D.), 1.4-inch inside diameter (I.D.) Standard Penetration Test (SPT) sampler or a 3-inch O.D., 2.4-inch I.D. California split barrel sampler using a standard 140-pound automatic trip hammer free-falling a height of 30 inches, or a 3-inch O.D. thin-walled “Shelby tube” sampler pushed into undisturbed soil using hydraulic pressure. The California sampler is in general conformance with ASTM D3550 and was used with stainless steel liners. The SPT sampler is in general conformance with ASTM D1586 and was used without liners to obtain SPT blow counts for use in engineering analyses. The Shelby sampler is in general conformance with ASTM D1587. Soil samples obtained from the borings were packaged and sealed in the field to reduce moisture loss and transported to Kleinfelder’s geotechnical laboratory for

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further examination and testing. At every driven sample, blow counts were recorded for each 6-inch interval for an 18-inch drive, or until refusal was met (defined as 50 blows for less than 6 inches). The uncorrected SPT blow counts measured in the field are presented on the boring log. The hydraulic pressure required to advance the Shelby tube sampler is also noted on the boring log.

A Kleinfelder field engineer logged the boring, visually classified the soils encountered according to the Unified Soil Classification System and handled samples from the boring. A key to the terms and symbols used on the boring log is presented on Figures A-1 and A-2 of Appendix A, and a log of the boring is presented on Figure A-3.

Soil classifications made in the field from samples and auger cuttings were in accordance with ASTM D2488. These classifications were re-evaluated in the laboratory after further examination and testing in accordance with ASTM D2487. The soil samples were packaged and transported to Kleinfelder's Hayward laboratory.

2.3 BORING ABANDONMENT

Upon boring completion, the boring was grouted with cement-bentonite grout, in accordance with the conditions of the drilling permit. Soil cuttings and left over fluids from the drilling were contained in DOT-approved 55-gallon steel drums, sampled and tested for hazardous materials, and transported off site for disposal.

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3 LABORATORY TESTING

Laboratory tests were performed on selected soil samples to estimate engineering characteristics of the various earth materials encountered. Testing was performed in general accordance with applicable ASTM Standards. The following laboratory test types were conducted:

- Natural water content (ASTM D2216) and dry unit weight (ASTM D2937)
- Grain-size analyses (ASTM D1140 or D6913)
- Atterberg Limits (ASTM D4318)
- Unconsolidated undrained triaxial compression (ASTM D2850)
- Incremental, One-Dimensional Consolidation (ASTM D2435)
- Resistance Value (R-Value) testing (ASTM D2844)
- Soil corrosion potential series (pH, resistivity, sulfate, and chloride)

The results of the laboratory testing are summarized on the boring log (Appendix A) and are presented in Appendix B.

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4 GEOLOGIC CONDITIONS

4.1 REGIONAL GEOLOGY

The Pier 92 site is located on the eastern margin of the San Francisco Peninsula adjacent to the San Francisco Bay, within the Coast Range Geomorphic Province of Northern California. This province is generally characterized by northwest-trending mountain ranges and intervening valleys, which are a reflection of the dominant northwest structural trend of the bedrock in the region. The basement rock in the northern portion of this province consists predominantly of the Franciscan Complex, a subduction complex of diverse groups of igneous, sedimentary and metamorphic rocks of Cretaceous to Upper Jurassic age (approximately 66 to 163.5 million years old), and to the east, the Coast Range Ophiolite and the Great Valley Complex, an Upper to Middle Jurassic age (approximately 145.0 to 174.1 million years old) volcanic ophiolite sequence with associated Lower Cretaceous to Upper Jurassic age (approximately 100.5 to 163.5 million years old) sedimentary rocks. The Coast Range Ophiolite and the Great Valley Complex were tectonically juxtaposed with the Franciscan Complex (most likely during subduction accretion of the Franciscan Complex), and these ancient fault boundaries are truncated by a modern right-lateral fault system that includes the San Andreas, Hayward, and Calaveras faults. Located approximately 8.2 miles southwest of the site, the San Andreas fault defines the westernmost boundary of the local bedrock. In the site vicinity, the Franciscan Complex is unconformably overlain by Tertiary age (approximately 2.6 to 66 million years old) continental and marine sedimentary and volcanic rocks. Inland of the San Francisco Bay, these Tertiary age rocks are locally overlain by younger Quaternary (less than approximately 2.6 million years old) alluvial, colluvial and landslide deposits. Beneath the Bay, and along much of its margin, the Franciscan Complex bedrock is overlain by a young, geologically unconsolidated sedimentary sequence, which, in places, exceeds 400 feet in thickness. The sequence is often subdivided into three “natural” units – Older Bay Mud (or Old Bay Clay), Bay Side Sand, and Younger Bay Mud. Artificial fill of variable quality and density has been placed along the margins of the bay to reclaim marshland and land once covered by shallow bay water.

4.2 SITE GEOLOGY

The geology at the site has been mapped by Goldman (1969), Bonilla (1998), and Witter et al. (2006) among others. Goldman (1969) indicates the bottom of younger bay mud at the site is at an elevation of approximately 80 feet below mean sea level, and the top of bedrock at an elevation between 200 and 250 feet below mean sea level. Bonilla (1998) indicates the site is underlain by Holocene age (less than

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approximately 12,000 years old) artificial fill (over bay mud), consisting of clay, silt, sand, rock fragments, organic matter and man-made debris. The ridgeline located southwest of the site is mapped as being dominantly underlain by bedrock of the Franciscan Complex, comprised dominantly of serpentinite, with localized zones of interbedded sandstone and shale, chert and greenstone. Bonilla (1998) indicates the flanks of the ridgeline at lower elevations are mantled with Holocene age slope debris and ravine fill, consisting of gravelly silt and clay, and clayey to silty sand and gravel.

The site has also been mapped by Witter et al. (2006). The reference indicates the site is underlain by artificial fill over estuarine mud. According to Witter et al. (2006), the unit has “very high” susceptibility to liquefaction.

Site-specific subsurface conditions are described in Section 5.2, and a site-specific liquefaction evaluation based on the information from our boring is described in Section 4.4.2.

4.3 FAULTING AND SEISMICITY

The site is not located within an Earthquake Fault Zone as defined by the California Geological Survey (CGS, 2024) in accordance with the Alquist-Priolo Earthquake Fault Zone Act of 1972. Significant faults in the project site vicinity are listed in Table 4-1. Moderate to major earthquakes generated on these and other faults in the region can be expected to cause strong ground shaking at the site.

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Table 4-1. Significant Faults

Fault Name	Closest Distance to Site (miles)
San Andreas	8.3 (8.2, CGS)
Hayward	10.6
San Gregorio	12.0
Pilarcitos	12.2
Point Reyes	12.6
Monte Vista-Shannon	18.9
Franklin	19.4
Calaveras	19.5
Mission	19.9
Mount Diablo Thrust	20.6
Green Valley	25.9
Los Medanos – Roe Island	27.7
Clayton	27.7
Silver Creek	28.3
Greenville	28.8
Rodgers Creek-Healdsburg	29.2
West Napa	29.8
Butano	30.3
Great Valley 05 (Pittsburg – Kirby Hills)	32.7
Bennett Valley	33.5
Zayante - Vergeles	38.6
Great Valley 04b (Gordon Valley)	44.1
Hunting Creek - Berryessa	46.9
Sargent	48.0

4.4 GEOLOGIC HAZARDS

Geologic hazards evaluated for the Pier 92 site include surface fault rupture, seismic shaking, liquefaction, lateral spreading, dynamic compaction/seismic settlement, and tsunami inundation/flooding. Descriptions of the impacts that these hazards may have on the site are described in the following sections.

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4.4.1 Surface Fault Rupture

The Pier 92 site is not located within an Alquist-Priolo Earthquake Fault Zone. The most proximal active fault is the San Andreas, which is located approximately 8.2 miles southwest of the site. Based on review of available geologic/seismologic reports and maps (see Section 8, References), no known active faults cross or project toward the site. Additionally, features associated with active faults were not observed during a site reconnaissance. Therefore, the potential for fault-related surface rupture at the site is considered very low.

4.4.2 Liquefaction and Lateral Spreading

Soil liquefaction is a condition where saturated soils undergo a substantial loss of strength and deformation due to pore pressure increase resulting from cyclic stress application induced by earthquakes. In the process, the soil acquires mobility sufficient to permit both horizontal and vertical movements if the soil mass is not confined. Soils most susceptible to liquefaction are saturated, loose, clean, uniformly graded, and fine sand deposits. If liquefaction occurs, foundations resting on or within the liquefiable layer may undergo settlements. This will result in reduction of foundation stiffness and capacities.

The site is located within the coverage of the CGS Earthquake Zones of Required Investigation Map, Hunters Point quadrangle (2003) and South San Francisco quadrangle (2021). These maps indicate that the site lies within an area identified as susceptible to seismically induced liquefaction. As previously indicated, Witter et al. (2006) indicate the site is underlain by artificial fill over estuarine mud with “very high” susceptibility to liquefaction.

Based on information from Boring B-1 drilled for this study, the site is underlain by loose silty sand and medium dense gravel and debris fill materials below the groundwater level and above the Bay Mud deposits. Fill soils encountered in previous borings performed at Pier 94 (Kleinfelder, 2018; Appendix C), at about 800 to 1,450 feet south-southwest of the Boring B-1, include loose to medium dense silty and clayey sands and significant fractions of clays, rock fragments and debris. The loose sandy soils contained in the fill are considered to be potentially liquefiable during a strong earthquake. Based on our review of Boring B-1 drilled for this study and the borings drilled at Pier 94, as reported by Kleinfelder (2018), the potentially liquefiable sandy fill soils appear to be discontinuous and of variable thickness.

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Liquefaction of the sandy fill soils could result in some localized seismically induced settlements. The amount of settlement will depend upon the local soil characteristics, topography, and the magnitude and duration of the earthquake. Based on the soils encountered in Boring B-1, seismically induced ground surface settlements are estimated to be as much as about 1 to 2 inches following a strong earthquake as a result of liquefaction of sandy fill soils. However, if greater thicknesses of loose sand are present, as encountered in previous Pier 94 borings (Kleinfelder, 2018), post-liquefaction settlements could approach several inches. Any ground settlements resulting from liquefaction are expected to be irregular across the site.

We understand deep foundation systems (piles) are not currently anticipated for current project structures. However, in general, any deep foundation systems that extend through the fill and underlying Young Bay Mud soils and into older sediments and weathered bedrock below the Bay Mud could be subject to drag load forces due to post-liquefaction settlement, in addition to drag load due to on-going Bay Mud consolidation settlement. Further, loss of soil strength and weakening of loose sands due to liquefaction should be considered in the evaluation of the axial and lateral resistance of pile foundations.

Lateral spreading is a potential hazard commonly associated with liquefaction where extensional ground cracking and settlement occur as a response to lateral migration of subsurface liquefiable material. These phenomena typically occur adjacent to free faces such as slopes and creek channels. Because the site is relatively flat and is, at a minimum, about 150 feet from San Francisco Bay shoreline (the nearest open face), the potential for lateral spreading to impact the project site is low.

4.4.3 Seismic Densification

Settlements can also occur during earthquakes in unsaturated, loose, cohesionless soils above the groundwater level. Dissipation of seismically induced pore water pressure in saturated, granular soils below the water level may also lead to settlements after the shaking has stopped. Based on our review of the information on the log of Boring B-1 drilled for this study, the fill materials in the upper approximately 10 feet (above groundwater level) include mixtures of random debris (brick), sand, gravel, and clays. In our judgment, highly localized densification of unsaturated sandy fills due to strong ground shaking cannot be precluded, and ground surface settlement due to seismic densification could approach about 1 to 2 inches.

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4.4.4 Flooding

Flood hazards are generally considered from three sources:

- Seismically induced waves (tsunami or seiche),
- Long-cycle storm events, and
- Dam failure inundation.

The site is located within the City of San Francisco at an approximate elevation of 13 to 21 feet above mean sea level. The Tsunami Hazard Area Map completed by the California Geological Survey (2022) for the County of San Francisco indicates the site is located within the zone susceptible to tsunami inundation.

According to the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Map, Community-Panel Number 0602980232A, effective March 23, 2021, the site is located within Zone X, considered an area of "minimal" flood hazard. As such, the potential for flood inundation to adversely affect the site is considered low.

According to the Association of Bay Area Governments (ABAG, https://www.abag.ca.gov/), the site is located outside a potential dam inundation zone. As such, the potential for flooding as a result of dam inundation is considered low.

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5 SITE AND SUBSURFACE CONDITIONS

5.1 SITE HISTORY

The project area is located on what was formerly part of San Francisco Bay. The inlet, formerly known as India Basin, was reclaimed by extensive filling. The project site lies between the modern Islais Creek Channel and India Basin. In the 1960s an underwater perimeter dike was constructed to retain fill for a new port terminal. Bay Mud soil dredged from the Bay was pumped behind the dike until the fill was generally above the level of the Bay. Debris fill was then pushed out to continue filling. Finally, a thin cap of relatively "clean" sand fill was placed to bring the site close to its current grade. Since the time of the fill construction, the site has been settling due to consolidation of the underlying weak, compressible Young Bay Mud soils.

5.2 SURFACE CONDITIONS

The project site is located northeast of Amador Street in San Francisco and is surrounded by Amador Street and a ready-mix concrete supplier to the west, Islais Creek Channel to the north, Pier 94 Wetlands and San Francisco Bay to the east, and an undeveloped lot to the south. A site reconnaissance was conducted on June 7, 2024 by a Kleinfelder field engineer. The current sand processing plant is occupied by tool and vehicle storage and two management trailers near the southwest, several separated aggregate stockpiles and relatively small ponds near the center, and several sand stockpiles near the eastern portion of the site. Much of the ground surface is covered with sand.

5.3 SUBSURFACE CONDITIONS

5.3.1 Stratigraphy

The Site Plan, Figure 2, shows the location of the boring drilled for this project. Key geotechnical data for the site are summarized below, which shows the five basic stratigraphic units beneath the site, as follows:

> **Fill** – sand, debris fill and dredged Bay Mud that was placed beginning in the early 1960s. In our boring, the fill is about 45 feet thick.

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Young Bay Mud– weak, compressible fat clay that underlies the fill and extends to a depth of about 100 feet. The Bay Mud contains varying amounts of organics, shell fragments and sand layers of variable thickness.

Older Sediments – generally interbedded dense clayey sands and stiff sandy clays of relatively low compressibility, including Old Bay Clay of moderate to high strength. At the location of the boring drilled for this study the older sediments underlie the Young Bay Mud and extend to a depth of about 290 feet.

Bedrock – consisting primarily of sandstone, serpentinite and shale bedrock of the Franciscan Formation. In our boring the bedrock is highly to completely weathered as hard, sandy fat clay. Boring B-1 drilled for this study terminated in the weathered bedrock at a depth of about 301 feet. In our previous (Kleinfelder 2018) borings drilled at Pier 94, the depth to the bedrock surface varies from about 230 to 277 feet.

5.3.2 Groundwater

Groundwater was first encountered during drilling of Boring B-1 at a depth of approximately 10 feet. After about 45 minutes, the groundwater level had lowered to 10½ feet, estimated to roughly coincide with the tide elevation in the adjacent San Francisco Bay. Based on historically high groundwater level contours (CGS, 2000), the recommended design groundwater level is at the ground surface.

Variations in groundwater levels are likely to occur seasonally, particularly during periods of prolonged rainfall or drought, and could vary as a function of other factors such as adjacent construction dewatering and tides.

5.3.3 Variations in Subsurface Conditions

Kleinfelder's interpretations of soil, rock, and groundwater conditions at the site are based on conditions encountered in the current and previous borings, site reconnaissance, and available published geologic information. The conclusions and recommendations that follow are based on those interpretations. If soil, rock, or groundwater conditions exposed during construction vary from those presented in this report, Kleinfelder should be notified to evaluate whether the following conclusions of recommendations should be modified.

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6 CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations presented in this report are developed based on general project and geotechnical information presented above. The conclusions and recommendations that follow are intended to guide geotechnical aspects of the project design and construction.

6.1 SEISMIC DESIGN PARAMETERS

The 2022 California Building Code (CBC) references ASCE 7-16 as the applicable standard for seismic design. In developing seismic design criteria, the characteristics of the soils underlying the site are an important input to evaluate the site response. Based on information obtained from the investigation, published geologic literature and maps, and interpretation of the 2022 CBC criteria, the site may be classified as Site Class E according to Section 1613.2.2 of the 2022 CBC and Table 20.3-1 of ASCE 7 16. Site Class E is defined as a soft clay soil profile with an average shear wave velocity in the upper 100 feet of less than 600 ft/sec, standard penetration test (SPT) blow counts (N-value) of less than 15 blows per foot, or an undrained shear strength of less than 1,000 psf. Site Class E is also applicable for any profile with more than 10 feet of soil having a soil plasticity index (PI) of greater than 20, moisture content (*w*) of at least 40 percent, and an undrained shear strength of less than 500 psf, which is applicable to the project site.

Seismic design parameters were developed consistent with the requirements of the 2022 CBC, ASCE 7-16, and Supplements 1 through 3 of that standard. Note that in accordance with Section 11.4.8 of ASCE 7-16 Supplement 3, a site-specific ground motion hazard analysis is required for Site Class E sites with mapped S_S values greater than or equal to 1.0 or mapped S_1 values greater than or equal to 0.2 unless exceptions are taken by the project structural engineer. Based on the Site Class E designation, the exception of Section 11.4.8 of ASCE 7-16 Supplement 3 states that a ground motion hazard analysis is not required for two exceptions: 1) where the equivalent lateral force procedure is used and the value of C_s is determined using Equation 12.8-2 for all periods for structural seismic design; and, 2) only for ground-supported storage tanks for liquids, where the spectral acceleration values for all periods are equal to the S_{DS} value as determined using Equation 15.7-7 of ASCE 7-16 and the value of S_{D1} is increased by 50 percent.

Assuming an exception may be taken by the project structural engineer per the 2022 CBC and ASCE 7-16 Supplement 3 based on a Site Class E designation, code-based parameters are provided in Table 6-1 and

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were estimated using the Seismic Design Maps website maintained by SEAOC/OSHPD (https://seismicmaps.org) and the requirements of the 2022 CBC and ASCE 7-16. As such, the code-based seismic design parameters provided in the following table for the spectral response acceleration at a period of 1.0 second (i.e., S_{M1} and S_{D1}) include a 50 percent increase should the exception under Item 2 of Section 11.4.8 of ASCE 7-16 Supplement 3 will be taken. If an exception is not taken by the project structural engineer, a site-specific ground motion hazard analysis will be required in accordance with the 2022 CBC and ASCE 7-16.

Table 6-1. Ground Motion Parameters based on 2022 CBC/ASCE 7-16

Parameter	Value	ASCE 7-16 Reference
Latitude	37.746110°	-
Longitude	-122.376679°	-
S_S	1.5	Figure 22-1
S_1	0.6	Figure 22-2
Site Class	E	Table 20.3-1
F_a	1.2(1)	Table 11.4-1 of Supplement 3
F_v	2.0(2)	Table 11.4-2 of Supplement 3
PGA	0.548	Figure 22-9
S_{MS}	1.8(1)	Eq. 11.4-1 and Section 11.4.8 of Supplement 3
S_{M1}	1.8(2)	Eq. 11.4-2 and Section 11.4.8 of Supplement 3
S_{DS}	1.2(1)	Eq. 11.4-3 and Section 11.4.8 of Supplement 3
S_{D1}	1.2(2)	Eq. 11.4-4 and Section 11.4.8 of Supplement 3
F_{PGA}	1.152	Table 11.8-1
PGA_M	0.632	Eq. 11.8-1
C_{RS}	0.933	Figure 22-18A
C_{R1}	0.913	Figure 22-19A
T_L	12 seconds	Section 11.4.6

Notes:

(1) Section 11.4.8 of ASCE 7-16 Supplement 3 requires a site-specific ground motion hazard analysis be performed for Site Class E sites with S_S values greater than or equal to 1.0 or S_1 values greater than or equal to 0.2 unless an exception is taken. The value of F_a shall only be used for calculation of T_S, determination of Seismic Design Category, linear interpolation for intermediate values of S_S, and when taking the exception under Item 2 of Section 11.4.8.

(2) Section 11.4.8 of ASCE 7-16 Supplement 3 requires a site-specific ground motion hazard analysis be performed for Site Class E sites with S_S values greater than or equal to 1.0 or S_1 values greater than or equal to 0.2 unless an exception is taken. The value of F_v shall only be used for calculation of T_S, determination of Seismic Design Category, linear interpolation for intermediate values of S_1, and when taking the exception under Item 2 of Section 11.4.8 for ground-supported liquid storage tanks. Values of S_{M1} and S_{D1} provided in the table include a 50 percent increase should the exception under Item 2 of Section 11.4.8 of ASCE 7-16 Supplement 3 is taken.

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6.2 GRADING

It is anticipated that site grading can be performed with conventional grading equipment and techniques, although the contractor should be prepared to handle debris (including wood, concrete, and bricks) that may be encountered during grading or in excavations. Engineered fill is expected to be incorporated throughout the site as needed to help establish finished grade elevations and for use as backfill against foundations and other buried structures. Recommendations for engineered fill are provided in Section 6.4.

6.3 SITE PREPARATION

Recommendations for site preparation and earthwork construction are presented below. All earthwork, including excavation, backfill and preparation of subgrade, should be performed in accordance with the geotechnical recommendations presented in this report and applicable portions of the grading code of local regulatory agencies. The grading contractor is responsible for notifying governmental agencies, as required, and the geotechnical engineer at the start of site preparation, the initiation of grading and any time that grading operations are resumed after an interruption. All earthwork should be performed under the observation and testing of Kleinfelder. References to compaction, maximum density and optimum moisture content are based on ASTM D1557, unless otherwise noted.

6.3.1 Stripping and Demolition

Areas to receive fill and structure foundations should be stripped of debris and any other deleterious materials prior to over-excavation or placement of engineered fill. Stripped debris or organic matter should not be reused as engineered fill. Any stripped soil that contains roots or other organics, debris, or deleterious materials should not be reused as engineered fill.

Foundation subgrade materials will be exposed and disturbed during demolition and stripping of any remnants of existing foundations and other underground structures. Existing foundations, debris, old concrete or pavement materials should be removed from proposed improvement areas. Excavations from removal of foundations, underground utilities, or other below-ground obstructions should be cleaned of loose soil and any potentially deleterious material and backfilled with compacted engineered fill, lean concrete or cement slurry backfill. In addition, active or inactive utilities within the construction area should be protected, relocated, or abandoned.

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Loose or soft subgrade soils encountered during construction may require over-excavation. The assessment of these areas and determination of over-excavation extent should be determined with consultation by Kleinfelder at the time of construction when conditions are exposed. Recommendations for subgrade preparation in wet areas are provided below in Section 6.3.4.

Stripping and removals should extend laterally a minimum of 5 feet beyond the perimeters of roadways, concrete flatwork, and any other facilities supported on grade.

6.3.2 Disturbed Soil and Subsurface Obstructions

Any loose or disturbed soils, abandoned underground structures and existing utilities, void spaces, or otherwise unsuitable conditions at the bottoms of excavations should be removed to expose firm or dense soil, as approved by the Kleinfelder field representative. Additional subgrade preparation recommendations are provided below.

6.3.3 Scarification and Compaction

After stripping and performing any necessary removals, the bottoms of excavations should be scarified to a depth of at least 8 inches, uniformly moisture conditioned to at least 2 percent above the optimum moisture content and compacted to at least 90 percent relative compaction. The subgrade should not be allowed to dry out prior to the placement of engineered fill or concrete improvements.

6.3.4 Foundation Subgrade Preparation

Concrete for foundations and exterior flatwork should be placed neat against undisturbed soil or properly prepared fill as described below. Foundation subgrades should not be allowed to dry out before placing concrete. If shrinkage cracks appear in the excavations, the excavations should be thoroughly moistened to close all cracks prior to concrete placement. The foundation excavations should be observed by the geotechnical engineer for compliance with appropriate moisture control and to confirm the adequacy of the supporting soils. If soft, loose, or otherwise deleterious materials are encountered at the bottoms of footing excavations, they should be removed and replaced with compacted engineered fill, lean concrete or additional foundation concrete.

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6.4 ENGINEERED FILL

6.4.1 Materials for Fill

Material for use in engineered fill should be free of significant organic materials, debris, and other deleterious materials, be essentially non-expansive, and have a maximum particle size less than 3 inches in maximum dimension, as described in the following table.

From a geotechnical materials perspective, some of the on-site, sandy near-surface soil and rock appear to be suitable for use as engineered fill, provided they meet environmental regulations and can be processed to meet the following requirements. In general, however, predominantly clayey near-surface soils are expected to likely have plasticity characteristics that make them susceptible to expansive soil behavior and will not be suitable for reuse as engineered fill. Such clayey materials, however, may be used as general fill where the fill does not directly support foundations or pavements and where it is not placed behind retaining walls or used as backfill against foundations.

Table 6-2. Engineered Fill Recommendations

Fill Requirement		**Test Procedures**	
Gradation		**ASTM**	**Caltrans**
Sieve Size	**Percent Passing**		
3 inch	100	D6913	202
¾ inch	70-100	D6913	202
No. 4	50-100	D6913	202
No. 200	20-70	D6913	202
Plasticity			
Liquid Limit	**Plasticity Index**		
<30	<12	D4318	204
Organic Content			
No visible organics		---	---
Expansion Potential			
20 or less		D4829	---
Soluble Sulfates			
Less than 2,000 ppm		---	417
Soluble Chloride			
Less than 300 ppm		---	422
Resistivity			
Greater than 2,000 ohm-cm		---	643

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Imported materials to be used for engineered fill should be sampled and tested by the geotechnical engineer prior to being transported to the site. Kleinfelder recommends representative samples of imported materials proposed for use as engineered fill be submitted to the geotechnical engineer for testing and approval at least one week prior to the start of grading and import of this material.

6.4.2 Placement and Compaction Criteria

Soils used for engineered fill should be uniformly moisture conditioned to at least 2 percent above the optimum moisture content, placed in horizontal lifts less than 8 inches in loose thickness, and compacted to at least 90 percent relative compaction. Within the upper 12 inches of pavement subgrade areas, the soil should be uniformly moisture conditioned to at least 2 percent above the optimum moisture content and be compacted to at least 95 percent relative compaction.

Additional fill lifts should not be placed if the previous lift did not meet the required relative compaction or if soil conditions are not stable. Disking or blending may be required to uniformly moisture condition soils used for engineered fill. Ponding or jetting compaction methods should not be allowed.

All site preparation and fill placement should be observed by Kleinfelder. It is important that during the stripping and scarification processes, a representative of the geotechnical engineer be present to observe whether any undesirable material is encountered in the construction area and whether exposed soils are similar to those encountered during the geotechnical site exploration.

6.5 WET WEATHER CONSIDERATIONS

Should construction be performed during or subsequently after wet weather, near-surface site soils may be significantly above the optimum moisture content. These conditions could hamper equipment maneuverability and efforts to compact site soils to the recommended compaction criteria. Disking to aerate, chemical treatment, replacement with drier material, stabilization with a geotextile fabric or geogrid, or other methods may be required to mitigate the effects of excessive soil moisture and facilitate earthwork and construction operations.

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6.6 TEMPORARY EXCAVATIONS

6.6.1 General

All excavations should comply with applicable local, state, and federal safety regulations including the current California Occupational Safety & Health Administration (Cal/OSHA) Excavation and Trench Safety Standards. Construction site safety generally is the responsibility of the contractor, who is also solely responsible for the means, methods, and sequencing of construction operations.

6.6.2 Excavations and Slopes

Slope height, slope inclination, or excavation depths (including utility trench excavations) should not exceed those specified in local, state, and/or federal safety regulations (e.g., Cal/OSHA Health and Safety Standards for Excavations, 29 CFR Part 1926, or successor regulations). Such regulations are strictly enforced, and, if they are not followed, the owner, contractor, or earthwork and utility subcontractors could be liable for substantial penalties. Based on Kleinfelder's interpretation of the Cal/OSHA regulations and on the findings from this investigation, the existing near-surface soils are expected to be predominantly Type C soils. For planning purposes, excavations less than about 20 feet deep should have maximum allowable temporary slopes of 1½H:1V. The actual Cal/OSHA soil type classification and sloping requirements should be determined by the contractor's responsible person based on the materials exposed during construction. Cal/OSHA requires that excavated slope heights in excess of 20 feet be designed by a professional engineer.

Underground utilities should be located above a 1H:1V plane projected downward from the bottoms of new foundations to avoid undermining the foundations during the excavation of the utility trench.

Groundwater is expected to be encountered within the upper 10 feet below the ground surface. The contractor should be aware of the expected variable groundwater elevations. Recommendations for subgrade preparation and workability improvement in saturated soils are provided in Section 6.5.

6.6.3 Trench Backfill

General trench backfill should be placed and compacted in accordance with recommendations provided in this report for engineered fill (Section 6.4). Separate bedding and backfill recommendations for pipes are provided below.

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6.6.4 Pipe Bedding and Pipe Zone Backfill Placement

In pipe bedding zones, special pipe bedding and backfill materials should be used to a minimum depth of 6 inches below the pipe and to a height of at least 12 inches above the top of pipe. The recommended pipe zone bedding and backfill gradation is provided in the following table.

Table 6-3. Select Pipe Bedding Backfill Gradation

Sieve Size	Percent Passing by Weight
¾ inch	100
No. 4	25 – 90
No. 200	0 – 12

In general, most of the soils that are likely to be encountered in trench excavations for this project contain fines (material passing the No. 200 sieve) that exceed the limits noted above. However, suitable granular materials for use in a select backfill blend may be found in limited quantities in on-site excavations.

Bedding materials (select backfill) should be compacted to a firm condition prior to placement of pipes. Initial backfill materials around the pipe zone should be placed in a manner to eliminate voids beneath the pipe. Select backfill materials should be placed in lifts approximately 8 inches in thickness and be compacted to at least 95 percent relative compaction based on ASTM D1557.

6.6.5 Temporary Shoring

If there is insufficient space for sloped excavations, shoring should be used to support the excavation sides. Cantilevered or braced shoring may be considered. Cantilevered shoring can be utilized where some deflection is acceptable. However, where shoring will support adjacent improvements or facilities and excessive deflection can lead to settlement, braced shoring should be utilized. Temporary shoring should be designed by a qualified California-registered civil engineer.

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6.7 SURFACE DRAINAGE

It is important that drainage away from the improvements be provided and maintained to reduce ponding and/or saturation of the soils in the vicinity of structures. The design should incorporate the basis for good drainage, including defined drainage gradients away from structures to points of conveyance, such as drainage swales and/or area drains and discharge pipes. A plan for long term maintenance to address settlement issues and to correct ponding and erosion areas should be developed.

During wet weather, earthen berms or other methods should be used to prevent runoff water from entering excavations. Runoff should be collected and disposed of outside the construction limits. Maintenance personnel should maintain the established site drainage by not blocking or obstructing gradients away from foundations or structures.

6.8 SHALLOW FOUNDATIONS

Foundations should satisfy two independent criteria with respect to foundation soils. First, the foundation should have an adequate safety factor against bearing failure with respect to shear strength of the foundation soils. Second, the vertical movements of the foundation due to settlement of the foundation soils (immediate elastic settlement, consolidation settlement and seismically induced settlements) should be within tolerable limits.

6.8.1 Shallow Foundation Net Allowable Bearing Pressure and Depth

Shallow mat slabs up to about 20 feet wide and spread or strip footings bearing on properly prepared subgrade soils, as described in Section 6.3 of this report, may be designed for a net allowable bearing pressure of 3,000 psf due to dead loads plus live loads. A one-third increase may be applied to this value when considering the effects of transient loads such as wind or seismic. The recommended net allowable bearing pressure includes a safety factor of at least 3 with respect to shear failure of the foundation soils.

Spread or strip footings should be founded at least 24 inches below lowest adjacent finished grade. Mat slabs should have turned down or thickened edges at least 24 inches deep to reduce water infiltration beneath the slabs. The design of mat slabs should include a base course of well-graded aggregate (such as Caltrans Class 2 Aggregate Base compacted to at least 95 percent relative compaction) at least 4 inches thick beneath the slabs.

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Where footings are located near and parallel to underground utilities, the footings should extend below a plane projected at a slope of 1H:1V upward from the utility to avoid surcharging the underground utility. This should be evaluated for both existing and new utilities at the site. Where footings are located adjacent to below-grade structures or near major underground utilities, the footings should extend below a 1H:1V plane projected upward from the structure footing or bottom of the underground utility to avoid surcharging the below grade structure and underground utility. Utility plans should be reviewed by Kleinfelder prior to trenching for conformance with these recommendations.

6.8.2 Shallow Foundation Lateral Load Resistance

Lateral loads may be resisted by a combination of friction between the foundation bottoms bearing on firm native soils or engineered fill, and by passive resistance acting against the vertical faces of the foundations. A coefficient of sliding friction of 0.35 between the foundation and the supporting subgrade may be used for design. For passive resistance for foundations placed neat against excavated soil or where engineered soil backfill is used against foundations, an equivalent fluid weight of 400 pounds per cubic foot (pcf) acting against the side of the foundation may be used. This value corresponds to a lateral deflection of less than about ½ inch. Passive resistance may be considered at the ground surface. The friction coefficient and passive resistance may be used concurrently without reduction. Under seismic and wind loading conditions, the passive pressure and frictional resistance may be increased by one-third.

6.8.3 Settlement due to Foundation Loads and Product Pile

As described above, the project area is situated on reclaimed marsh land. As described above, the fill is generally granular and ranges from loose to very dense.

Structural loads (dead load plus live load [DL+LL]) from the new equipment and tent building, combined with loading from aggregate piles over large lateral areas adjacent the new foundations and proposed pavement areas, will lead to large settlements. This is due to the presence of the weak and compressible Young Bay Mud clay layer (underlying the fill) which will be subject to consolidation settlement.

Geotechnical analyses for assessment of consolidation settlement were performed using data from the current investigation and previous nearby projects along with anticipated loading from the provided plans and structural loads. The computed consolidation settlement estimate resulting from placement of the new product pile and gantry conveyor, as illustrated on Figure 2, is expected to be up to about

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2 feet (24 inches). This settlement is expected to occur over several decades as the load is in place. To accommodate on-going settlement throughout the life of the project site, provisions for periodic releveling of structures or equipment should be incorporated into the project design.

6.8.4 Subgrade Modulus

A modulus of subgrade reaction for long term settlement, K_{V1}, of 130 pounds per square inch per inch of deflection (for a 1 square foot bearing plate) may be used for mat slab design. The modulus should be scaled for the actual slab/mat dimension using appropriate formulas or software.

6.8.5 Hydrostatic Uplift

Groundwater conditions are described in Section 5.3.2. For purposes of hydrostatic uplift design, the groundwater level should be taken at the ground surface. For uplift resistance computation purposes, use of a total unit weight of concrete of 150 pcf (submerged or buoyant unit weight of and a total unit weight of soil (undocumented fill soils) of 125 pcf are recommended.

6.8.6 Shallow Foundation Construction Considerations

Prior to placing steel or concrete, foundation excavations should be cleaned of any debris, disturbed soil or water. Footing concrete should be poured neat against non-expansive engineered fill. All foundation excavations should be observed by a representative of Kleinfelder just prior to placing fill and/or steel or concrete. The purpose of these observations is to check that the bearing soils exposed in foundation excavations are similar to those assumed in analysis and to verify the recommendations contained herein are implemented during construction.

Underground utilities that are 4 feet deep or shallower and that run parallel to shallow foundations generally should be located no closer than 2 feet horizontally away from the perimeter edges of the footing or slab. Deeper utilities should be located above a 1H:1V (horizontal to vertical) slope projected downward from the bottom edges of the slab. Utility plans should be reviewed by Kleinfelder prior to trenching to evaluate conformance with this requirement.

6.9 DRILLED PIER FOUNDATIONS

We understand reinforced concrete drilled pier foundations shallower than about 15 feet may be considered for support of the proposed new tent building.

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6.9.1 Axial Resistance

A drilled pier foundation system should be designed to develop axial pile capacity through skin friction. End bearing is not considered in the axial resistance due to heterogeneity of foundation materials, the possibility of encountering relatively weak Young Bay Mud soils at or near drilled pier tip elevations, and the difficulty of providing a clean drilled hole into which concrete and reinforcement can be placed. Based on the soil conditions encountered in the upper 15 feet of Boring B-1 (primarily granular fill soils), the allowable compressive (downward) capacity may be based on an allowable unit skin friction of 260 psf and the allowable tensile (uplift) capacity may be taken as 80 percent of the allowable compressive capacity. A one-third increase in the allowable capacity may be used for consideration of transient loads such as wind or seismic. The foundation weight may be added when evaluating uplift resistance.

The allowable axial capacities provided above include a safety factor of at least 2.5 with respect to shear failure of the foundation soils. Contact Kleinfelder if additional capacity is needed as difficult drilling conditions through debris fill is anticipated between depths of 15 and 22 feet.

For drilled piers supporting loads under the recommended allowable axial resistance, additional post-construction settlement beyond the settlement discussed in Section 6.8.3 is expected to be less than about 1 inch.

The axial capacity recommendations provided above apply to single, isolated piers. Consideration of group effects on axial geotechnical resistance of drilled pier foundations is usually not necessary with center-to-center spacings of at least three diameters. For closer spacings, the resistance of individual piers will be reduced. For these cases, Kleinfelder should be consulted to evaluate axial resistance on a case-by-case basis.

6.9.2 Lateral Resistance

The lateral resistance of a drilled pier is a function of the surrounding soil strength and stiffness, size and stiffness of the pier, pier top connection, and induced moments and forces at the top of the pier. Resistance to lateral loads on piers will be provided by passive soil pressure against the pile and by the bending strength of the pier itself.

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For pier caps and grade beams located within the sandy/gravelly fill soils, the passive pressure may be calculated using an equivalent fluid pressure of 400 pcf. This is a triangular distribution that may be applied over a projected area based on twice the pier diameter.

Frictional resistance may also be assumed to act along one side of the pier cap or grade beam, but not both sides at the same time. For pier caps founded in the sandy/gravelly fill, the frictional resistance along the sides of pier caps may be estimated by using a coefficient of friction of 0.35. The effective at-rest pressures normal to the sides of the structural elements should be used in estimating frictional resistance along the sides. We recommend using an at-rest pressure based on an equivalent fluid weight of 60 pcf. The resistance from pile caps and grade beams and the pressure distribution may be calculated from the ground surface.

If drilled pier foundations are founded entirely within the fill (maximum pier length of about 15 feet), friction along the bottoms of pier-supported structures (grade beams, pile caps) may be included in lateral resistance calculations based on a coefficient of friction of 0.35.

The discussion of lateral resistance is applicable for piles spaced at least seven effective diameters apart. For pile groups with spacings closer than about seven effective pile diameters Kleinfelder should refine our conclusions once the pile layout and load demands are refined.

6.9.3 Drilled Pier Construction Considerations

Based on the soil conditions encountered at the site during the current field investigation and previous nearby sites, there is a potential for caving during drilling and, therefore, casing is recommended in undocumented fill soils. As discussed in groundwater conditions in Section 5.3.2, groundwater may be encountered during pier drilling within the upper 10 feet. Groundwater could occur at or near the ground surface during or following periods of extended rainfall.

Consistent with the 2022 CBC, drilled pier excavations should be observed and approved by the geotechnical engineer prior to installation of reinforcement. The depths of all pier excavations should be checked immediately prior to concrete placement to verify sloughing and/or caving has not reduced the required hole depth. This may be done with a weighted tape measure or similar measuring device.

If water more than 6 inches deep is present during concrete placement, either the water should be pumped out or the concrete should be placed into the hole using tremie methods. Tremie methods may

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also be needed if after pumping the water quickly returns to the hole. If tremie methods are used, the end of the tremie pipe must remain below the surface of the in-place concrete at all times.

Concrete used for pier construction should be discharged vertically into the drilled hole to reduce aggregate segregation. Under no circumstances during pile construction should concrete be allowed to free-fall against either the steel reinforcement of the sides of the excavation. Steel reinforcement and concrete should be placed on the same day of completion of each pier excavation. Additionally, drilled excavations should be scheduled to allow concrete in each pier to set overnight before drilling adjacent holes that are closer than four diameters on-center.

Concrete used for pier construction should have a design slump of from 4 to 6 inches if placed in a dry shaft without temporary casing, and from 6 to 8 inches if temporary casing is used. The concrete mix should be designed with appropriate admixtures and/or water/cement ratios to achieve these recommended slumps. Adding water to a conventional mix to achieve the recommended slump should not be allowed. For concrete mixes with slumps over 6 inches, vibration of the concrete during placement is generally not recommended as aggregate settlement may result in the lack of aggregate within the upper portion of the pier.

If temporary straight-sided steel casing is used for conventional drilled pier construction, it should be removed from the hole as concrete is being placed. The bottom of the casing should be maintained below the top of the concrete during casing withdrawal and concrete placement operations. Casing should not be withdrawn until sufficient quantities of concrete have been placed into the excavation to balance the groundwater head outside the casing. Continuous vibration of the casing or other methods may be required to reduce the potential for voids occurring within the concrete mass during casing withdrawal. Casing should not be left in the ground except by permission of the project geotechnical and structural engineers.

6.10 CORROSIVITY

One near-surface soil sample was tested for potential corrosion to ferrous metals (i.e., steel pipe, ductile iron pipe and reinforcing steel) and chloride and sulfate attack to concrete. These tests are only an indicator of soil corrosivity for the sample and location tested. Other soils found on-site may be more, less, or of a similar corrosive nature. The soil samples were sent to CERCO Analytical, Inc. for testing of pH, resistivity, and soluble chlorides, sulfates, and sulfides in general accordance with ASTM Test Methods. The results of the laboratory tests are presented in Appendix B and summarized in the following table.

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Table 6-4. Corrosion Potential Test Results

Boring	Depth (feet)	Material	Resistivity, ohm-cm	Oxidation Reduction Potential, mV	pH	Water-Soluble Ion Concentration, mg/kg		
			Saturated			Sulfide	Chloride	Sulfate
B-1	5	Sand	340	+230	8.39	N.D.	470	91

N.D. – None Detected

Kleinfelder's scope of services does not include corrosion engineering and, therefore, a detailed analysis of the corrosion test results is not included in this report. A qualified corrosion engineer should be retained to 1) evaluate the corrosion potential of the site soils to proposed improvements, 2) recommend further testing as required, and 3) provide specific methods for corrosion mitigation that are appropriate for the project.

Corrosion allowances and added section thicknesses for steel foundation elements should be considered. Reinforced concrete for pile caps, grade beams and floor slabs should consider using corrosion and sulfate resistant cement, with increased concrete cover over the steel rebar. The amount of corrosion allowance will be dependent on the type of pile foundation system selected and the design life of the structure.

6.11 FLEXIBLE PAVEMENTS

Pavements for this project are expected to consist of heavy-duty pavement for truck traffic. Bulk samples of the near-surface soil were obtained from the site during the field investigation. The results of the laboratory testing indicate an R-value of 74. Based on potential variability of the existing, undocumented sand with gravel fill, an R-value of 50 has been used for design. The recommended pavement sections are presented in the table below, which are based on the Caltrans design method, which includes a factor of safety applied to the asphalt thickness. Based on Kleinfelder's experience with similar projects, using a Traffic Index (TI) of at least 7.0 is suggested for the estimated truck traffic.

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Table 6-5. Recommended AC Flexible Pavement Sections (R-value = 50)

Traffic Index	Alternative 1		Alternative 2
	AC (inches)	AB (inches)	AC (inches)
7.0	4.0	4.5	7.5
7.5	4.5	5.0	8.5
8.0	4.5	5.5	9.0

Notes: AC = Type A or B Asphalt Concrete
AB = Class 2 Aggregate Base (Minimum R-Value = 78)

The anticipated traffic indices and the recommended pavement sections presented above should be reviewed by the project civil engineer in consultation with the owner during the development of the final grading and paving plans. These pavement design recommendations are based on the pavement subgrade soil consisting of existing on-site surface material consisting of silty sands. If site grading exposes soil other than that utilized in the analysis, Kleinfelder should perform additional tests to confirm or revise the recommended pavement sections to reflect the actual field conditions.

Compacted pavement subgrade should be non-yielding. Removal and subsequent replacement of some material (i.e., areas of excessively wet materials, unstable subgrade, or pumping soils) may be required to obtain the minimum recommended compaction to the recommended depth.

Pavement sections adjacent the 35,000-ton raw pile and the 9,500-ton product pile may undergo continued settlement, resulting in ponding areas.

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7 LIMITATIONS

The recommendations contained in this report are based on Kleinfelder's field observations and subsurface exploration, limited laboratory tests, previous report, and present knowledge of the proposed construction. It is possible that soil conditions could vary between or beyond the points explored. If soil conditions are encountered during construction which differ from those described herein, Kleinfelder should be notified immediately in order that a review may be made and any supplemental recommendations provided. If the scope of the proposed construction, including the proposed loads or structural locations, changes from that described in this report, the recommendations should also be reviewed.

Kleinfelder has prepared this report in accordance with the generally accepted geotechnical engineering practice as it exists in the site area at the time of the study. No warranty, either express or implied, is made. The recommendations provided in this report are based on the assumption that an adequate program of tests and observations will be conducted by the Geotechnical Engineer of record during the construction phase in order to evaluate compliance with the recommendations. Other standards or documents referenced in any given standard cited in this report, or otherwise relied upon by the author of this report, are only mentioned in the given standard; they are not incorporated into it or "included by reference," as that latter term is used relative to contracts or other matters of law.

This report may be used only by Martin Marietta and their consultants and partners for this project, and only for the purposes stated within a reasonable time from its issuance, but in no event later than three (3) years from the date of the report. Land or facility use, on and off-site conditions, regulations, or other factors may change over time, and additional work may be required with the passage of time. Based on the intended use of the report, Kleinfelder may require that additional work be performed and that an updated report be issued. Non-compliance with any of these requirements by the client or anyone else will release Kleinfelder from any liability resulting from the use of this report by any unauthorized party and client agrees to defend, indemnify, and hold harmless Kleinfelder from any claim or liability associated with such unauthorized use or non-compliance.

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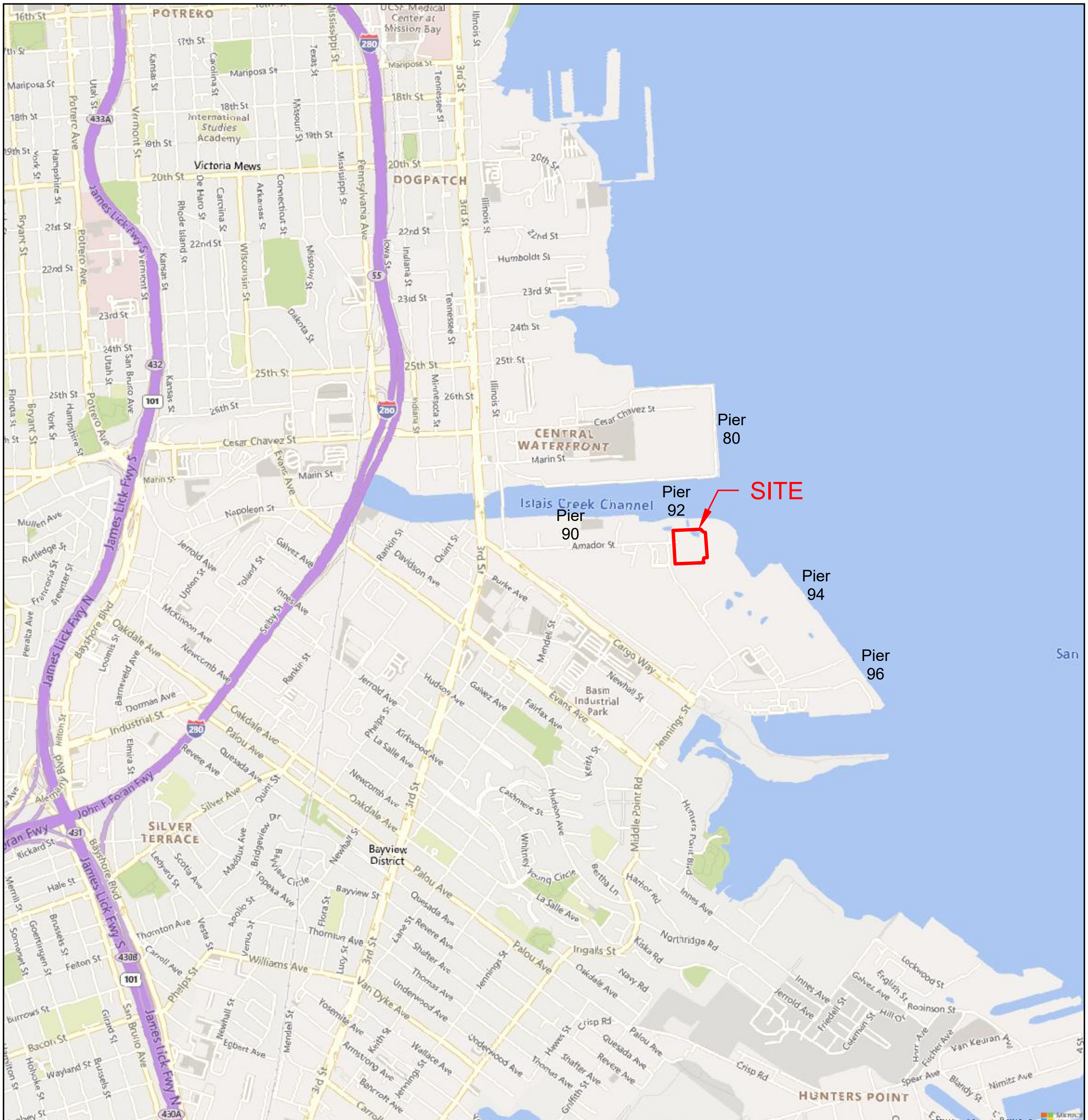
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Figures

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0 2000 4000

SCALE: 1" = 2000' SCALE IN FEET

N

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VICINITY MAP

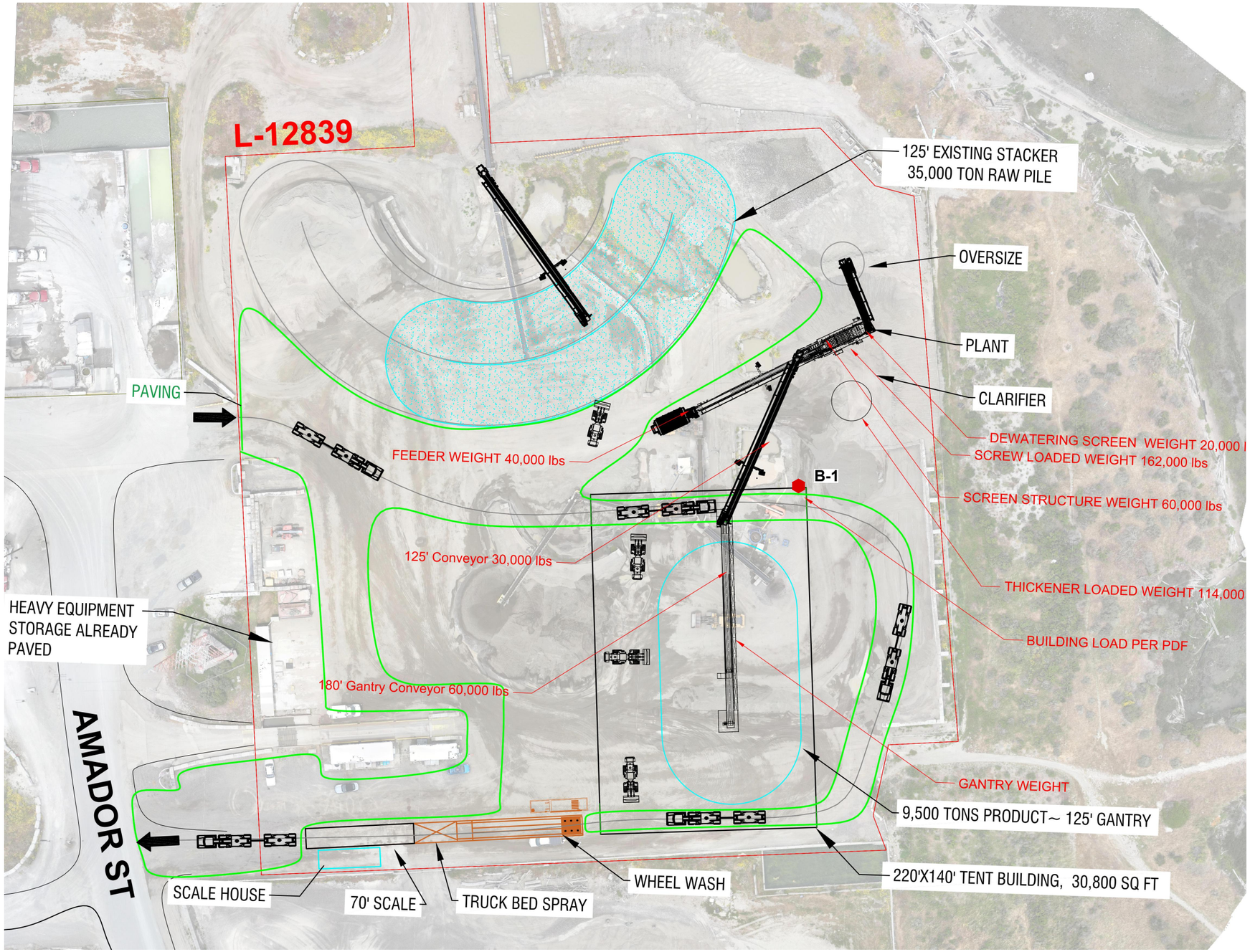
PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE

1

CAD FILE: \\kleinfelder.com\shares\PLEASANTON-DATA\WORKING\2025\25000566.001A - Pier 92\25000566.dwg

PLOTTED: 7/2/2024 11:35 AM BY: jeff sala
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LEGEND

SOIL BORING LOCATION

N

0 70 140

SCALE: 1" = 70' SCALE IN FEET

NOTE:
BORING LOCATION WAS NOT SURVEYED AND SHOULD BE CONSIDERED APPROXIMATE.

REFERENCE:
PIER 92 NEW PLANT, COVERED STORAGE WITH GANTRY SITE PLAN, DATED 12-18-2023, BY MARTIN MARIETTA.

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DATE:	07-02-2024
REVISED:	

SITE MAP

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
2

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BORING LOG

Appendix A

DRILLING METHOD/SAMPLER TYPE GRAPHICS

BULK SAMPLE

CALIFORNIA SAMPLER
(3 in. (76.2 mm.) outer diameter)

SHELBY TUBE SAMPLER

STANDARD PENETRATION SPLIT SPOON SAMPLER
(2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)

GROUND WATER GRAPHICS

WATER LEVEL (level where first observed)

WATER LEVEL (level after stabilizing period)

WATER LEVEL (additional levels after exploration)

OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Solid lines separating strata on the logs represent approximate boundaries only, dashed lines are inferred or extrapolated boundaries. Actual transitions may be gradual or differ from those represented.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System (ASTM D2488/D2487) designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., CL-ML, GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS

C_u - Coefficients of Uniformity
C_c - Coefficients of Curvature
WOH - Weight of Hammer
WOR - Weight of Rod

REFERENCES

1. American Society for Materials and Testing (ASTM), 2011, ASTM D2487: Classification of Soils for Engineering Purposes (Unified Soil Classification System).

UNIFIED SOIL CLASSIFICATION SYSTEM[1]

COARSE GRAINED SOILS (More than 50% retained on No. 200 Sieve)	**GRAVELS** (More than 50% of coarse fraction retained on No. 4 Sieve)	CLEAN GRAVEL WITH <5% FINES	**GW**	WELL-GRADED GRAVEL, WELL-GRADED GRAVEL WITH SAND
			GP	POORLY GRADED GRAVEL, POORLY GRADED GRAVEL WITH SAND
		GRAVELS WITH 5% TO 12% FINES	**GW-GM**	WELL-GRADED GRAVEL WITH SILT, WELL-GRADED GRAVEL WITH SILT AND SAND
			GW-GC	WELL-GRADED GRAVEL WITH CLAY (OR SILTY CLAY), WELL-GRADED GRAVEL WITH CLAY AND SAND (OR SILT CLAY AND SAND)
			GP-GM	POORLY GRADED GRAVEL WITH SILT, POORLY GRADED GRAVEL WITH SILT AND SAND
			GP-GC	POORLY GRADED GRAVEL WITH CLAY (OR SILTY CLAY), POORLY GRADED GRAVEL WITH CLAY AND (OR SILTY CLAY AND SAND)
		GRAVELS WITH > 12% FINES	**GM**	SILTY GRAVEL, SILTY GRAVEL WITH SAND
			GC	CLAYEY GRAVEL, CLAYEY GRAVEL WITH SAND
			GC-GM	SILTY, CLAYEY GRAVEL SILTY, CLAYEY GRAVEL WITH SAND
	SANDS (50% or more of coarse fraction passes the No. 4 Sieve)	CLEAN SANDS WITH <5% FINES	**SW**	WELL-GRADED SAND, WELL-GRADED SAND WITH GRAVEL
			SP	POORLY GRADED SAND, POORLY GRADED SAND WITH GRAVEL
		SANDS WITH 5% TO 12% FINES	**SW-SM**	WELL-GRADED SAND WITH SILT, WELL-GRADED SAND WITH SILT AND GRAVEL
			SW-SC	WELL-GRADED SAND WITH CLAY (OR SILTY CLAY), WELL-GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
			SP-SM	POORLY GRADED SAND WITH SILT, POORLY GRADED SAND WITH SILT AND GRAVEL
			SP-SC	POORLY GRADED SAND WITH CLAY, POORLY GRADED SAND WITH CLAY AND GRAVEL (OR SILTY CLAY AND GRAVEL)
		SANDS WITH > 12% FINES	**SM**	SILTY SAND, SILTY SAND WITH GRAVEL
			SC	CLAYEY SAND, CLAYEY SAND WITH GRAVEL
			SC-SM	SILTY, CLAYEY SAND, SILTY, CLAYEY SAND WITH GRAVEL
FINE GRAINED SOILS (50% or more passes the No. #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)		**ML**	SILT, SILT WITH SAND, SILT WITH GRAVEL
			CL	LEAN CLAY, LEAN CLAY WITH SAND, LEAN CLAY WITH GRAVEL
			CL-ML	SILTY CLAY, SILTY CLAY WITH SAND, SILTY CLAY WITH GRAVEL
			OL	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL
	SILTS AND CLAYS (Liquid Limit 50 or greater)		**MH**	ELASTIC SILT. ELASTIC SILT WITH SAND, ELASTIC SILT WITH GRAVEL
			CH	FAT CLAY, FAT CLAY WITH SAND, FAT CLAY WITH GRAVEL
			OH	ORGANIC CLAY, ORGANIC CLAY WITH SAND, ORGANIC CLAY WITH GRAVEL, ORGANIC SILT, ORGANIC SILT WITH SAND, ORGANIC SILT WITH GRAVEL

NOTE: USE MATERIAL DESCRIPTION ON THE LOG TO DEFINE A GRAPHIC THAT MAY NOT BE PROVIDED ON THIS LEGEND.

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PROJECT NO.: 25000566.001A
DRAWN BY:
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GRAPHICS KEY

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-1

PLOTTED: 07/24/2024 07:20 PM BY: RGee
PROJECT NUMBER: 25000566.001A OFFICE FILTER: OAKLAND
gINT FILE: Klf_gint_master_2025 gINT TEMPLATE: E:KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_GEO_LEG1_GRAPHICS_KEY_W_USCS]

GRAIN SIZE[1]

DESCRIPTION		SIEVE SIZE	GRAIN SIZE
Boulders		>12 in.	>12 in. (304.8 mm.)
Cobbles		3 - 12 in.	3 - 12 in. (76.2 - 304.8 mm.)
Gravel	coarse	3/4 -3 in.	3/4 -3 in. (19 - 76.2 mm.)
	fine	#4 - 3/4 in.	0.19 - 0.75 in. (4.8 - 19 mm.)
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)
Fines		Passing #200	<0.0029 in. (<0.07 mm.)

SECONDARY CONSTITUENT[1]

Term of Use	AMOUNT	
	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

PLASTICITY[1]

DESCRIPTION	CRITERIA
Non-Plastic	A 1/8 in. (3 mm) thread cannot be rolled at any water content.
Low	The thread can barely be rolled and the lump cannot be formed when drier than the plastic limit.
Medium	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump crumbles when drier than the plastic limit.
High	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump can be formed without crumbling when drier than the plastic limit.

MOISTURE CONTENT[1]

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CONSISTENCY - FINE-GRAINED SOIL[2, 3]

CONSISTENCY	SPT - N (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Easily penetrated several inches by fist
Soft	2 - 4	0.25 ≤ PP <0.5	500 - 1,000	Easily penetrated several inches by thumb
Medium Stiff	4 - 8	0.5 ≤ PP <1	1,000 - 2,000	Can be penetrated several inches by thumb with moderate effort
Stiff	8 - 15	1 ≤ PP <2	2,000 - 4,000	Readily indented by thumb but penetrated only with great effort
Very Stiff	15 - 30	2 ≤ PP <4	4,000 - 8,000	Readily indented by thumbnail
Hard	>30	4 ≤ PP	>8,000	Indented by thumbnail with difficulty

APPARENT DENSITY - COARSE-GRAINED SOIL[2]

APPARENT DENSITY	SPT-N (# blows / ft)
Very Loose	<4
Loose	4 - 10
Medium Dense	10 - 30
Dense	30 - 50
Very Dense	>50

STRUCTURE[1]

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. (6mm) thick, note thickness.
Laminated	Alternating layers of varying material or color with the layers less than 1/4-in. (6 mm) thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.
Homogeneous	Same color and appearance throughout

ANGULARITY[1]

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

REACTION WITH HYDROCHLORIC ACID[1]

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

CEMENTATION[1]

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or little finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

REFERENCES

1. American Society for Materials and Testing (ASTM), 2017, ASTM D2488: Standard Practice for Description and Identification of Soils (Visual Manual Procedures).
2. Terzaghi, K and Peck, R., 1948, Soil Mechanics in Engineering Practice, John Wiley & Sons, New York.
3. United States Department of the Interior Bureau of Reclamation (USBR), 1998, Earth Manual, Part I.

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PROJECT NO.: 25000566.001A

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DATE:

SOIL DESCRIPTION KEY
(For additional tables, see ASTM D2488)

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE

A-2

PLOTTED: 07/24/2024 07:21 PM BY: RGee
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 25000566.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [KLF_GEO_LEG2_SOIL_DESC_KEY]

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

FIELD EXPLORATION

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Well-Graded SAND with Silt and Gravel (SW-SM): fine to coarse sand and fine to coarse gravel, rounded to sub-angular, reddish brown, moist, loose to medium dense, debris, including pieces of bricks contains seashell fragments [FILL]	Bulk-1				SW-SM			71	11			R-Value: 74 Hand auger to 5 ft.
		gray to brown, 2.5' to 3'	Bulk-2											
5		gray, increase in fine sand, trace silt, below 4.5'	1		BC=13 23 12	12"					12			Switched to Solid Flight Auger Corrosivity Test
		Poorly Graded SAND (SP): gray, moist to wet, dense, trace silt [FILL]												
		Lean CLAY (CL): low plasticity, dark brown, moist, medium stiff, [FILL]	2B 2C		BC=3 13 48 PP=0.5	18"	GW-GC	6.8	120.7	34	7.0			Cobble stuck in bottom of sampler
10		**Well-Graded GRAVEL with Sand and Clay (GW-GC)**: fine to coarse sand, very dark brown, moist, very dense, green serpentine-like [FILL]	3		BC=4 4 4	12"	SM	21.4		75	13			Switched to Mud Rotary Casing installed to 34 ft.
		Silty SAND with Gravel (SM): fine sand and fine to coarse gravel, non-plastic to low plasticity, black, moist to wet, loose, wood debris [FILL]	4B 4C		BC=7 9 21	10"								
15		**Poorly Graded GRAVEL with Clay and Sand (GP-GC)**: fine to coarse sand and fine to coarse gravel, black to greenish black mottled with gray, wet, medium dense, [FILL]	5		BC=6 8 11	6"								
			6		BC=36 13 8	6"								
		DEBRIS FILL: wood, concrete and bricks [FILL]												
20			7		BC=10 15 10	12"								
		Clayey SAND (SC): fine sand, non-plastic to low plasticity, dark bluish gray, wet, medium dense, debris including wood, concrete and bricks [FILL]	8		BC=19 9 7	6"								
25			9		BC=13 15 17	1"								
30		**Lean CLAY with Sand (CL)**: fine to medium sand, medium plasticity, bluish gray, wet, very soft, debris including wood, bricks and glass [FILL]			BC=12 4 3	NR								
			10B 10C		BC=3 3 3	NR								
35		**Lean CLAY (CL)**: medium plasticity, bluish gray, wet, very soft, traces of fine sand, seashell fragments and wood debris [FILL]	11B 11C		BC=1 3 2	NR		48.7				40	20	

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DATE:	7/19/2024

BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

PLOTTED: 07/24/2024 09:00 PM BY: RGee
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 25000566.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Lean CLAY (CL): medium plasticity, bluish gray, wet, very soft, traces of fine sand, seashell fragments and wood debris [FILL]	12		PT=0 PT=40-50 PT=60 PP=<0.25	32"								Su = 280 psf (TV)
45		**Sandy Fat CLAY (CH)**: fine to coarse sand, sub-angular, medium to high plasticity, bluish gray, wet, soft, copper wire debris [FILL]	13B		BC=5 4 1 PP=0.25	13"								Su = 300 psf (TV)
		Fat CLAY (CH): high plasticity, bluish gray mottled with black, wet, soft, seashell fragments [NATIVE]	13C					49.4	69.3			67	42	
50		dark bluish gray, soft to medium stiff, trace of coarse gravel at top of sampler	14		PT=0 PT=60-80 PT=100 PT=120 PP=0.75	32"								Rig chatter Su = 600 psf (TV)
55			15B 15C		BC=3 1 1 PP=0.5	16"								Su = 600 psf (TV)
60		very soft, below 60'			PT=50-70 PT=95 PT=100-110 PT=120	NR								
			16		PP=<0.25	7"								Su = 60 psf (TV)
65														
70		soft to medium stiff, below 70'	17		PT=60 PT=80 PT=90-120 PP=0.75	36"								Su = 700 psf (TV)
75														

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PROJECT NO.:	25000566.001A
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DATE:	7/19/2024

BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000566.001A
OFFICE FILTER: OAKLAND
PLOTTED: 07/24/2024 09:00 PM BY: RGee

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): high plasticity, bluish gray, wet, soft to medium stiff, seashell fragments	18B 18C		BC=0 0 3 PP=0.5	18"								Su = 340 psf to 550 psf (TV)
85														
90		very soft to soft, below 90'	19		PT=60-80 PT=100 PT=110 PT=120 PP=<0.25	32"		54.3	65.4			57	31	Consolidation Test Su = 260 psf (TXUU) Su = 240 psf (TV)
95														
100		**Clayey SAND (SC)**: low to medium plasticity, dark greenish black, wet, medium dense	20B 20C		BC=7 11 15 PP=<0.25	NR								Rock stuck in the sand catcher
		bluish gray, below 103'												
105		fine sand, greenish gray mottled with black, dense, below 104'	21B 21C		BC=13 21 25 PP=>4.5	18"	SC	23.4	104.2		29	29	14	
110														
		very dense, increase in sand content, below 113'	22		BC=3 32 50/4"	16"								
115														
		brown, below 118'												

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DRAWN BY: DD
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DATE: 7/19/2024

BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000566.001A
OFFICE FILTER: OAKLAND
PLOTTED: 07/24/2024 09:00 PM BY: RGee

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

FIELD EXPLORATION

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): fine sand, low to medium plasticity, brown, wet, very dense	23B 23C		BC=12 27 33 PP=1.5	18"					38			
125		**Fat CLAY (CH)**: high plasticity, dark bluish gray, wet, very stiff, fine sand and coarse gravel at top of sampler												
130			24		PT=0 PT=60-100 PT=140-180 PT=200 PT=210-240 PP=2.0	30"								Su = 1.3 ksf (TV)
135														
140		bluish gray to gray, medium stiff to stiff, below 140'	25B 25C		BC=0 7 10 PP=1.25	18"		47.1	75.0			66	37	Su = 1.1 ksf to 1.4 ksf (TV)
145														
150		dark bluish gray, below 150'	26		PT=80 PT=90-100 PT=120 PT=140-160 PP=1.25	33"								Su = 1.1 ksf (TV)
155														

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PROJECT NO.:	25000566.001A
DRAWN BY:	DD
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BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000566.001A
OFFICE FILTER: OAKLAND
PLOTTED: 07/24/2024 09:00 PM BY: RGee

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
	Fat CLAY (CH): high plasticity, dark bluish gray, wet, stiff	27B 27C		BC=0 3 8 PP=1.25	18"		49.7	72.0					Su = 1.1 ksf to 1.3 ksf (TV)
165													
	trace of sand, below 169'												
170	**Fat CLAY with Sand (CH)**: high plasticity, brown, wet, very soft	28		PP=0.25 PT=0 PT=60 PT=220 PT=250 PP=3.5	31"								
	Sandy Fat CLAY (CH): low to medium plasticity, bluish green, wet, very stiff												
175													
180	**Fat CLAY with Sand (CH)**: high plasticity, bluish gray to dark bluish gray, wet, medium stiff to stiff	29B 29C		BC=0 0 10 PP=1.5	18"								Su = 1.2 ksf (TV)
	Sandy Fat CLAY (CH): high plasticity, bluish gray to dark bluish gray, wet, stiff												
185													
190	**Fat CLAY (CH)**: high plasticity, bluish gray, wet, hard, trace of fine sand	30		PT=0 PT=90 PT=150-200 PT=220-250 PT=280-400 PT=400 PP=>4.5	33"								
195													

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BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000566.001A
OFFICE FILTER: OAKLAND
PLOTTED: 07/24/2024 09:00 PM BY: RGee

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): high plasticity, bluish gray, wet, hard, trace of fine sand	31B 31C		BC=16 28 35 PP=>4.5	18"		30.8	92.3					
205														
		black, fine to coarse, subangular sand, 209' to 210'	32		BC=9 14 19 PP=>4.5	6"								
210														
215														
220		soft to medium stiff, below 220'	33B 33C		BC=17 20 28 PP=0.75 PP=0.25	14"								Su = 0.8 ksf (TV)
		Fat CLAY with Sand (CH): fine sand, high plasticity, bluish gray, wet, soft, organics (rootlets)												
225														
		seashell fragments, fine to medium sand, 229' to 231.2'	34B 34C		BC=11 20 24 PP=<0.25 PP=2.0	15"								
230		greenish gray, very stiff, organics (rootlets), below 231'												
		increase in sand content, below 234'												
235														

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PROJECT NO.:	25000566.001A
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BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000566.001A
OFFICE FILTER: OAKLAND
PLOTTED: 07/24/2024 09:00 PM BY: RGee

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): medium to high plasticity, bluish gray mottled with brown and dark reddish brown, wet, very dense	35		BC=13 26 31	18"					47			
245		increase in sand and gravel content, 244' to 245'												
		Sandy Fat CLAY (CH): medium to high plasticity, bluish gray mottled with brown and dark reddish brown, wet, hard												
250		fine to medium sand and coarse gravel, sub-rounded, medium plasticity, bluish gray to gray, below 250'	36		BC=6 17 28	9"								
		increase in sand content, below 251.5'												
255														
260		decrease in sand content, below 260'												
265		**Fat CLAY (CH)**: high plasticity, dark bluish gray, wet, very stiff to hard, traces of coarse sand and fine, sub-rounded gravel	37B 37C		BC=13 27 28 PP=4.5 PP=3.25	18"								
270														
275														Rig chatter Increased rig chatter

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PROJECT NO.:	25000566.001A
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DATE:	7/19/2024

BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

PLOTTED: 07/24/2024 09:00 PM BY: RGee
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 25000566.001A
OFFICE FILTER: OAKLAND

Date Begin - End:	6/24/2024 - 6/27/2024	**Drilling Co.-Lic.#:**	Pitcher Services LLC - #1044895	**BORING LOG B-1**	
Logged By:	AN	**Drill Crew:**	Marcos, Fine		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 1500	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	Solid Flight Auger, Mud Rotary	**Hammer Efficiency:**	74.6%
Weather:	Clear	**Exploration Diameter:**	8 in., 4 in. O.D.	**Hammer Cal. Date:**	1/23/2024

FIELD EXPLORATION | LABORATORY RESULTS

Latitude: 37.74610°
Longitude: -122.37660°
Surface Condition: Bare Earth

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): medium to high plasticity, greenish gray, wet, hard, traces of coarse sand and fine, sub-rounded gravel	38		BC=9 18 19 PP=>4.5	9"								Rig chatter
285		increase in sand content, below 285'												
290		**Sandy Fat CLAY (CH)**: fine to coarse sand, sub-angular, medium to high plasticity, greenish gray, wet, hard	39		BC=18 30 50/5" PP=>4.5	17"								
295														
300		fine to medium sand, sub-angular, high plasticity, dark greenish gray, decrease in sand content, below 300'	40		BC=10 21 21 PP=4.5	6"								Rig chatter
		The boring was terminated at approximately 301.5 ft. below ground surface. The boring was backfilled with grout on June 27, 2024.												
305														
310														
315														

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 10 ft. below ground surface at first encounter.
▽ Groundwater was observed at approximately 10.5 ft. below ground surface at about 45 minutes after first encounter.

GENERAL NOTES:
The exploration location is approximate and was estimated by Kleinfelder.

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PROJECT NO.:	25000566.001A
DRAWN BY:	DD
CHECKED BY:	RG
DATE:	7/19/2024

BORING LOG B-1

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
A-3

PLOTTED: 07/24/2024 09:00 PM BY: RGee
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 25000566.001A
gINT FILE: Klf_gint_master_2025
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2025.GLB [_KLF_BORING/TEST PIT SOIL LOG]

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LABORATORY TEST RESULTS

Appendix B

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-1	0.0 - 3.0	Bulk-1	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)			99	71	11				R-Value: 74
B-1	5.0 - 6.5	1	WELL GRADED SAND WITH SILT (SW-SM)					12				Corrosivity Test
B-1	8.5	2C	WELL GRADED GRAVEL WITH SAND AND CLAY (GW-GC)	6.8	120.7	42	34	7.0				
B-1	10.0 - 11.5	3	SILTY SAND WITH GRAVEL (SM)	21.4		86	75	13				
B-1	35.5	11B	SANDY LEAN CLAY WITH SHELLS (CL)	48.7					40	20	20	
B-1	46.0	13C	ORGANIC CLAY WITH SHELLS (OH)	49.4	69.3				67	25	42	
B-1	92.0	19	FAT CLAY (CH)									Consolidation Test
B-1	92.5	19	FAT CLAY (CH)	54.3	65.4				57	26	31	Su = 260 psf (TXUU)
B-1	107.0	21C	CLAYEY SAND (SC)	23.4	104.2			29	29	15	14	
B-1	121.0	23C	SILTY CLAYEY SAND (SC-SM)					38				
B-1	141.0	25C	FAT CLAY (CH)	47.1	75.0				66	29	37	
B-1	161.0	27C	FAT CLAY (CH)	49.7	72.0							
B-1	201.0	31C	FAT CLAY (CH)	30.8	92.3							
B-1	240.0	35	CLAYEY SAND WITH GRAVEL (SC)					47				

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

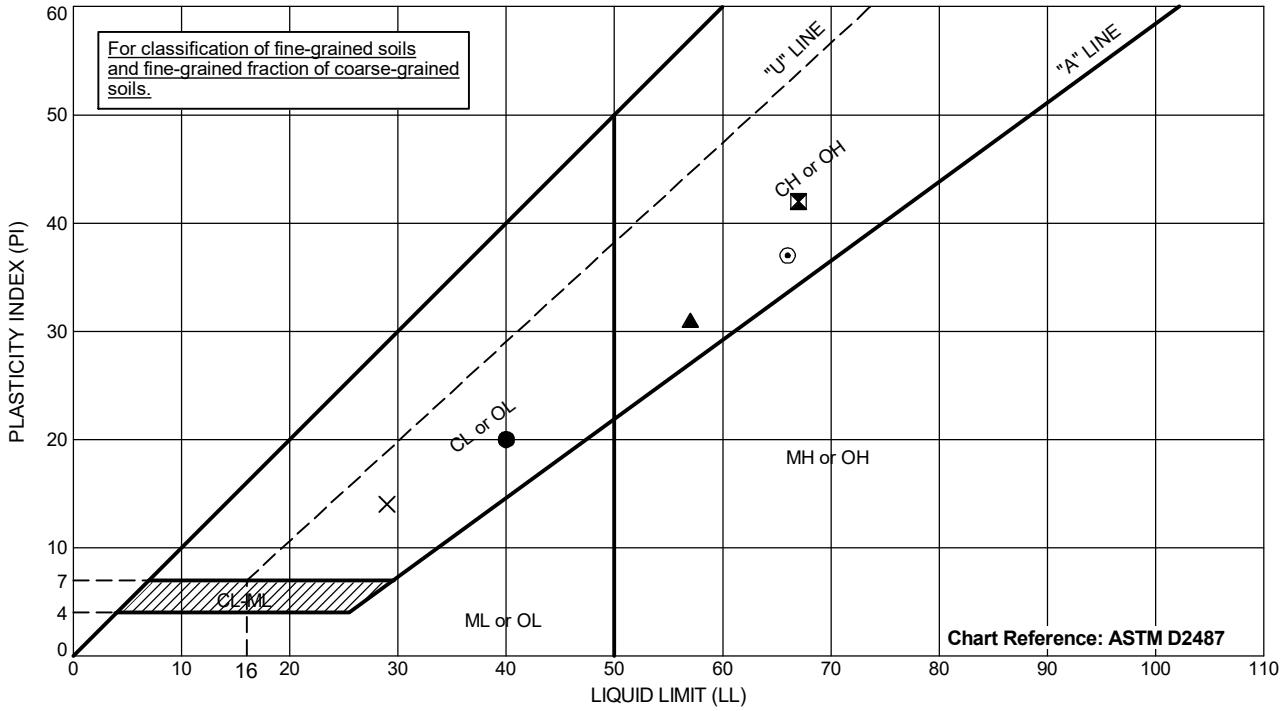
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LABORATORY TEST RESULT SUMMARY

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
B-1



Exploration ID		Depth (ft.)	Sample Description	Passing #200	LL	PL	PI
●	B-1	35.5	SANDY LEAN CLAY WITH SHELLS (CL)	NM	40	20	20
⊠	B-1	46	ORGANIC CLAY WITH SHELLS (OH)	NM	67	25	42
▲	B-1	92.5	FAT CLAY (CH)	NM	57	26	31
×	B-1	107	CLAYEY SAND (SC)	29	29	15	14
⊙	B-1	141	FAT CLAY (CH)	NM	66	29	37

Testing performed in general accordance with ASTM D4318.
NP = Nonplastic
NM = Not Measured

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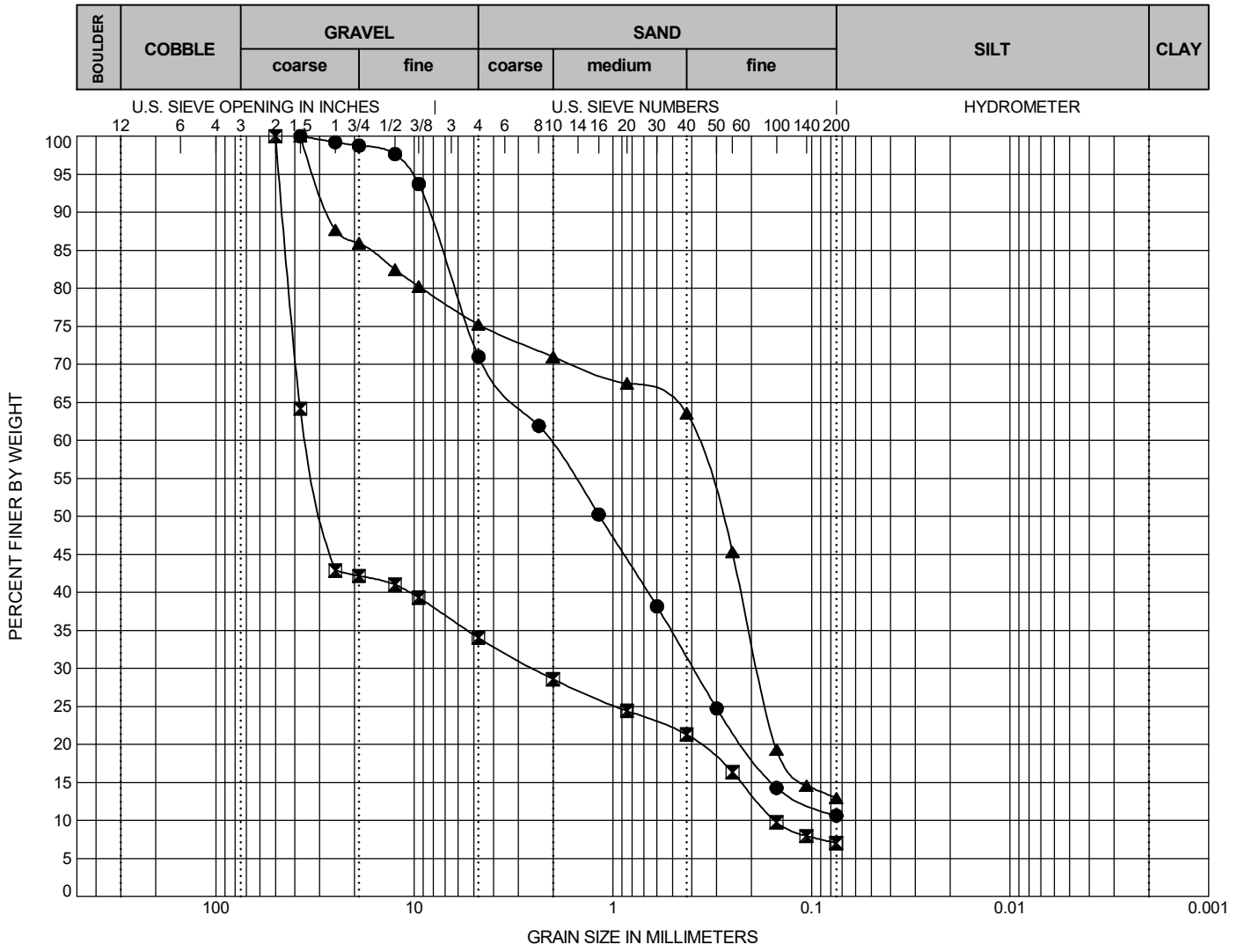
PROJECT NO.: 25000566.001A
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ATTERBERG LIMITS

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

FIGURE
B-2

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Exploration ID		Depth (ft.)	Sample Description	LL	PL	PI
●	B-1	0 - 3	WELL GRADED SAND WITH SILT AND GRAVEL (SW-SM)	NM	NM	NM
⊠	B-1	8.5	WELL GRADED GRAVEL WITH SILTY AND SAND (GW-GM)	NM	NM	NM
▲	B-1	10 - 11.5	SILTY SAND WITH GRAVEL (SM)	NM	NM	NM

Exploration ID		Depth (ft.)	D_{100}	D_{60}	D_{30}	D_{10}	Cc	Cu	Passing 3/4"	Passing #4	Passing #200	%Silt*	%Clay*
●	B-1	0 - 3	37.5	2.109	0.394	NM	1.10	31.64	99	71	11	NM	NM
⊠	B-1	8.5	50	34.643	2.511	0.153	1.19	226.38	42	34	7.0	NM	NM
▲	B-1	10 - 11.5	37.5	0.383	0.185	NM	NM	NM	86	75	13	NM	NM

*These numbers represent silt-sized and clay-sized content but may not indicate the percentage of the material with the engineering properties of silt or clay. Sieve Analysis and Hydrometer Analysis testing performed in general accordance with ASTM D6913(Sieve Analysis) and ASTM D7928 (Hydrometer Analysis).
NP = Nonplastic
NM = Not Measured

Coefficients of Uniformity - $C_u = D_{60} / D_{10}$
Coefficients of Curvature - $C_C = (D_{30})^2 / D_{60} D_{10}$
D_{60} = Grain diameter at 60% passing
D_{30} = Grain diameter at 30% passing
D_{10} = Grain diameter at 10% passing

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DATE:

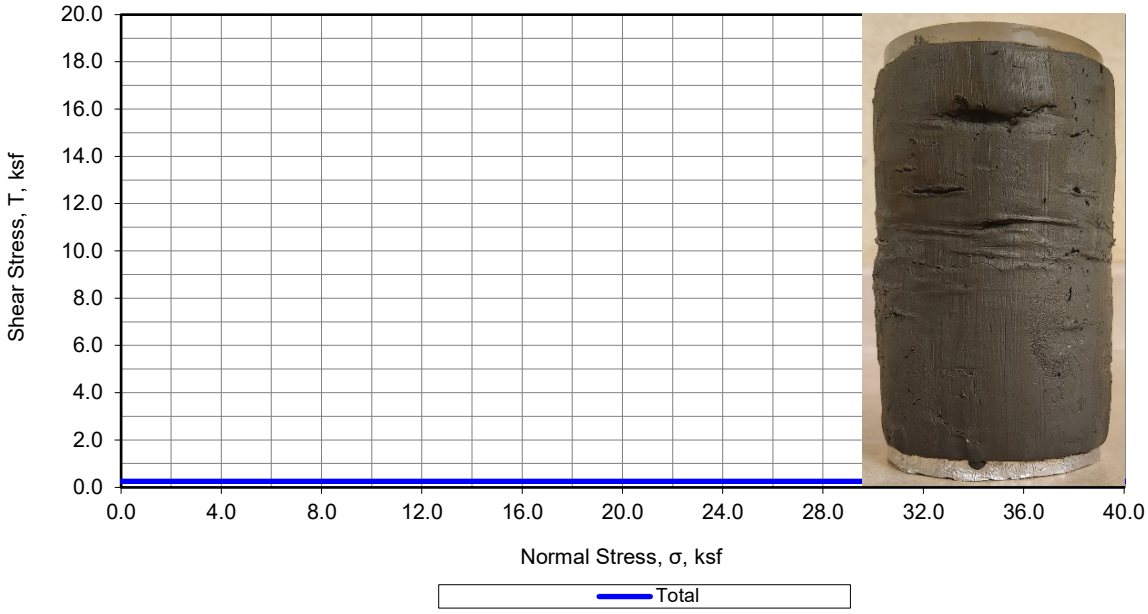
SIEVE ANALYSIS

PROPOSED NEW SAND PROCESSING PLANT
PIER 92
SAN FRANCISCO, CALIFORNIA

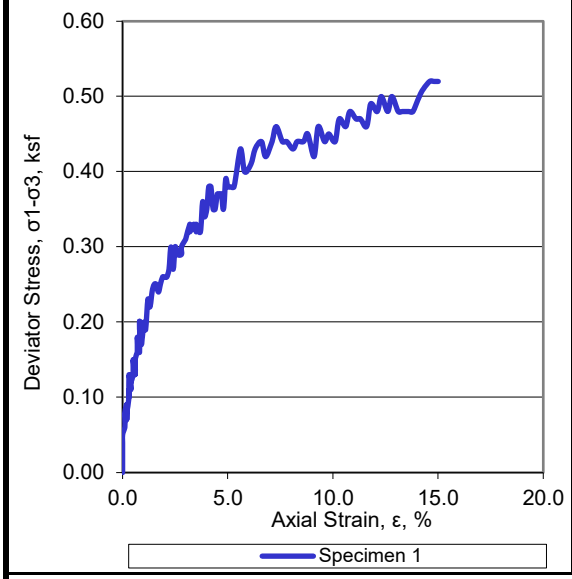
FIGURE
B-3

PLOTTED: 07/16/2024 12:04 PM BY: CPimentel
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Total		
c =	0.26	ksf



Specimen Shear Picture



Specimen No.			1
Initial	Diameter, in	D_O	2.86
	Height, in	H_O	5.63
	Water Content, %	ω_O	54.3
	Dry Density, lbs/ft^3	γd_o	65.4
	Saturation, %	S_O	94
	Void Ratio	e_O	1.530
Minor Principal Stress, ksf		σ_3	4.20
Maximum Deviator Stress, ksf		$(\sigma 1-\sigma 3)_{max}$	0.52
Time to $(\sigma_1-\sigma_3)_{max}$, min		t_f	15.02
Deviator Stress @ 15% Axial Strain, ksf		$(\sigma_1-\sigma_3)_{15\%}$	0.52
Ultimate Deviator Stress, ksf		$(\sigma_1-\sigma_3)_{ult}$	na
Rate of strain, %/min		'ε	1.00
Axial Strain at Failure, %		ε_f	15.02

Description of Specimen: Black Fat Clay (CH)

Amount of Material Finer than the No. 200, %: nm

LL:	56	PL:	26	PI:	30	G_S:	2.65 Assumed

Specimen Type: Undisturbed

Test Method: ASTM D2850

Membrane correction applied

Boring:	B-1
Sample:	19
Depth, ft:	92.5
Test Date:	7/8/24

Remarks: nm= not measured, na = not applicable

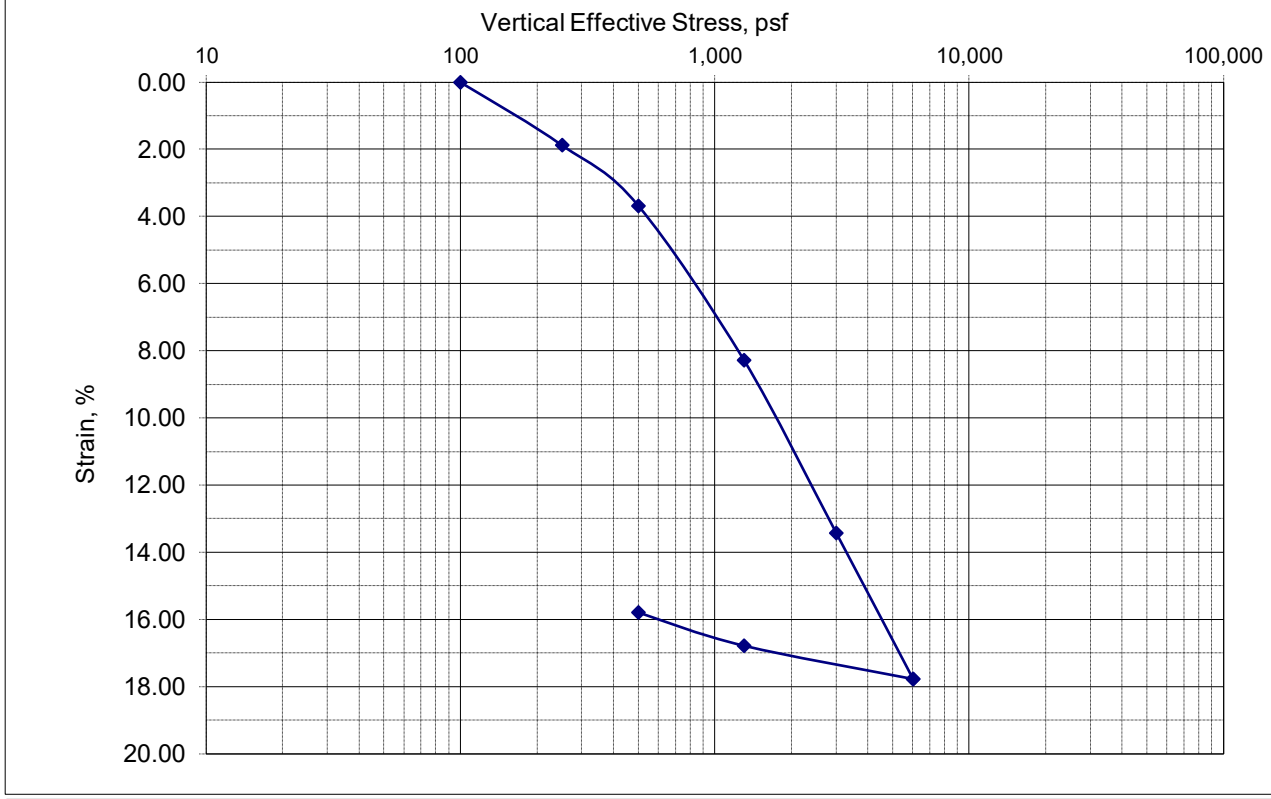
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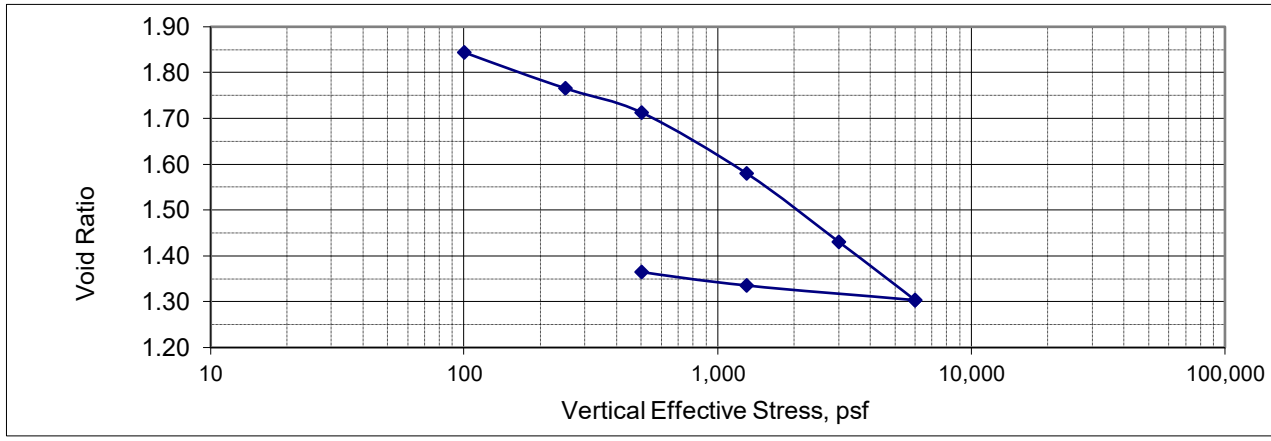
Project No.:	25000566.001A
Date:	7/16/24
Entry By:	C. Pimentel
Checked By:	C. Pimentel
File Name:	HL15951

TRIAXIAL COMPRESSION TEST (UU)

Proposed New Sand Processing Plant
Pier 92
San Francisco, California

Figure
1 of 1
B-4





Test Method:	ASTM D2435, Method B		Sample Type: Intact		Sample Description: Black Fat Clay (CH)		
Gs: 2.65	Assumed	LL: 57	PI: 31		Amount of Material Finer than the No. 200, %: nm		
	Height, in.	Diameter, in.	Water Content, %	Wet Density, lb/f^3	Dry Density, lb/f^3	Saturation, %	Void Ratio
Initial	0.784	2.500	51.8	88.3	58.2	74.4	1.844
Final	`	2.500	45.1	100.2	69.1	85.6	1.395

Boring:	B-1
Sample:	19
Depth, ft:	92.3
Test Date:	7/8/24

Remarks:

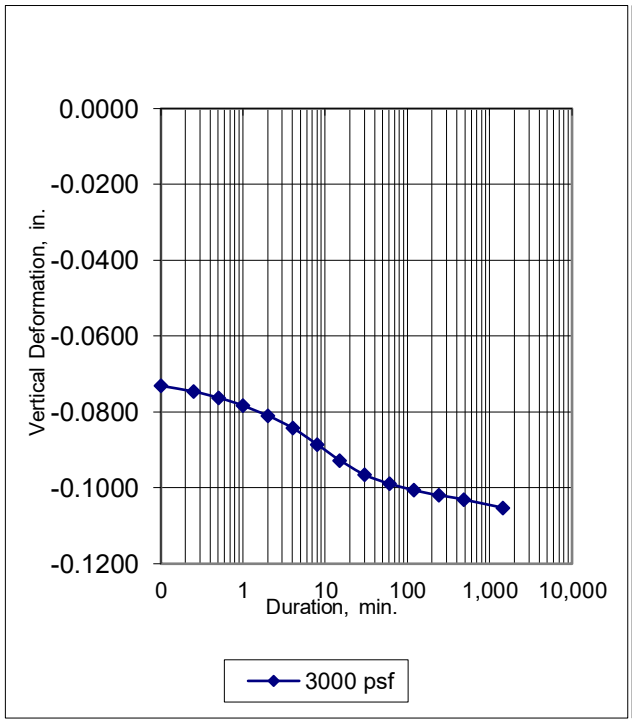
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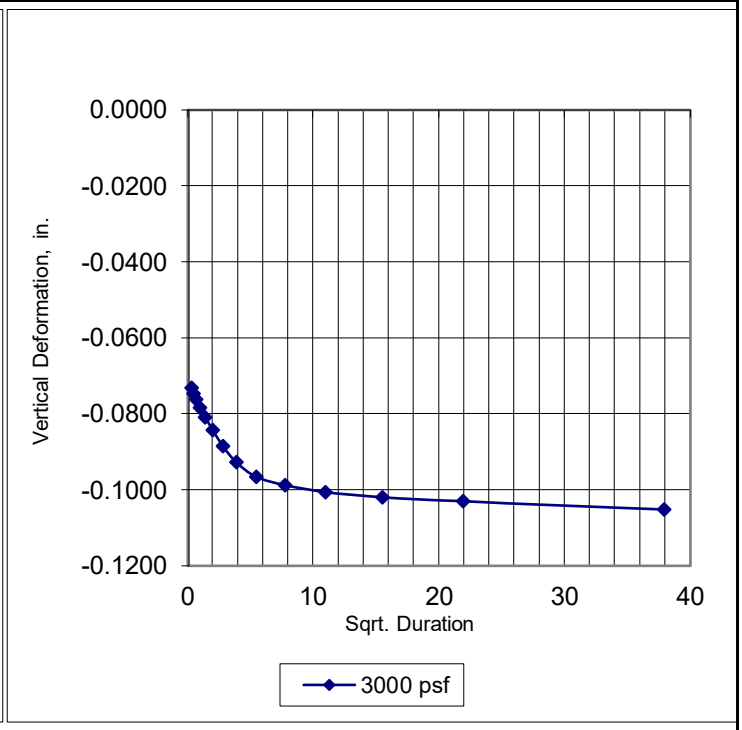
PROJECT NO. 25000566.001A
ENTRY BY: C. Pimentel
CHECKED BY: C. Pimentel
DATE: 7/22/2024

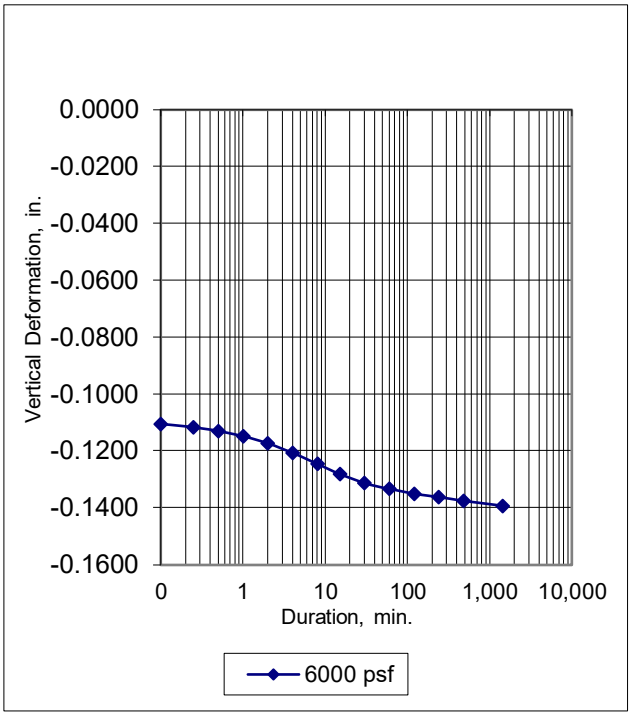
ONE DIMENSIONAL CONSOLIDATION TEST

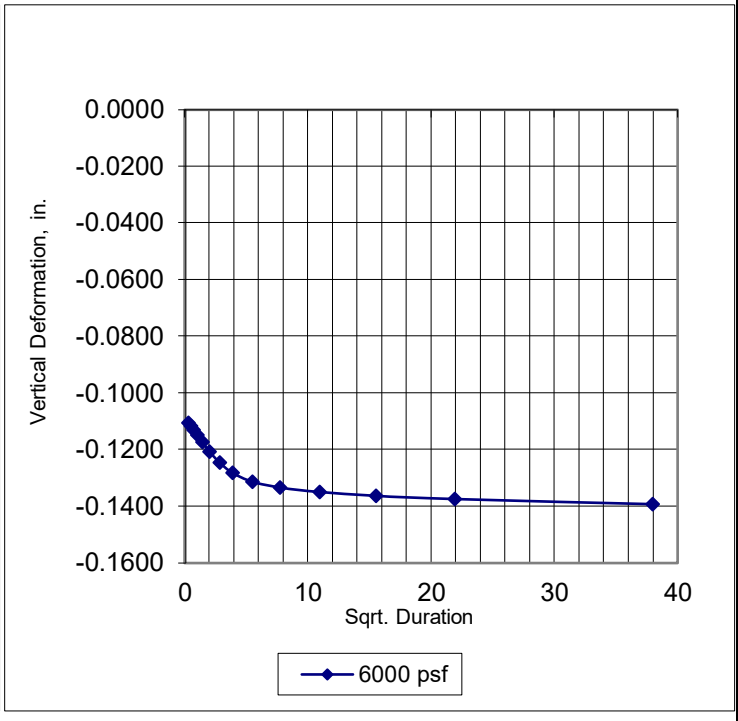
Proposed New Sand Processing Plant
Pier 92
San Francisco, California

FIGURE
B-5









Boring:	B-1
Sample:	19
Depth, ft:	92.3
Test Date:	7/8/24

Remarks:

KLEINFELDER
Bright People. Right Solutions.
2601 Barrington Ct, Hayward, CA, 94545

PROJECT NO.: 25000566.001A
ENTRY BY: C. Pimentel
CHECKED BY: C. Pimentel
DATE: 7/22/2024

ONE DIMENSIONAL CONSOLIDATION TEST

Proposed New Sand Processing Plant
Pier 92
San Francisco, California

FIGURE

B-5

Laboratory Test Report

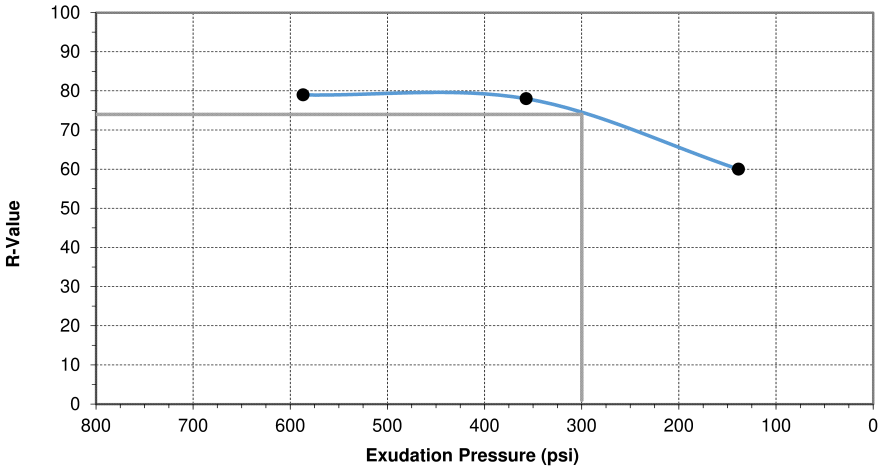
Client:	**Martin Marietta Materials**	Report No.:	**24-HAY-01498 Rev. 0**	Issued:	**7/16/2024**
Project:	**25000566.001A**			Field ID:	**HL16047**
	Sand Processing Plant Pier 92	Sampled by:	**A. Noroozi**	Date:	**6/27/2024**
	02-000L - Laboratory Testing	Submitted by:	**M. Hernandez**	Date:	**7/1/2024**

Tested on **7/8/2024** by **M. Paulson**

Test Method: **ASTM D2844**

Material Description: **Brown Well Graded Gravel with Silt and Sand (GW-GM)**

Specific Location: **B-1 @ 0-3.0'**



Briquette No.	A	B	C
Dry Unit Weight at Test (pcf)	134.3	133.1	133.9
Expansion Pressure (psf)	0	0	0
Exudation Pressure (psi)	587	139	357
Moisture at Time of Test (%)	6.0	6.9	6.4
Resistance Value	79	60	78
R - VALUE AT 300 PSI EXUDATION PRESSURE:			**74**

Reviewed on 7/16/2024 by Cindy Pimentel,
Senior Technician

Limitations: Pursuant to applicable building codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specifications were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet), if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

KLEINFELDER Bright People. Right Solutions.	PROJECT NO.: 25000566.001A DRAWN BY: CP CHECKED BY: RG DATE: 7/16/2024	R-VALUE PROPOSED NEW SAND PROCESSING PLANT PIER 92 SAN FRANCISCO, CALIFORNIA	FIGURE B-6

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

15 July, 2024

Job No. 2407011
Cust. No. 10527

Ms. Cindy Pimentel
Kleinfelder
6801 Koll Center Parkway, Ste. 150
Pleasanton, CA 94566

Subject: Project No.: 25000566.002A
Project Name: Sand Processing Plant Pier 92
Corrosivity Analysis – ASTM Test Methods

Dear Ms. Pimentel:

Pursuant to your request, CERCO Analytical has analyzed the soil sample submitted on July 08, 2024. Based on the analytical results, this brief corrosivity evaluation is enclosed for your consideration.

Based upon the resistivity measurement, the sample is classified as "severely corrosive". All buried iron, steel, cast iron, ductile iron, galvanized steel and dielectric coated steel or iron should be properly protected against corrosion depending upon the critical nature of the structure. All buried metallic pressure piping such as ductile iron firewater pipelines should be protected against corrosion.

The chloride ion concentration is 470 mg/kg. Chloride ion concentrations greater than 300 mg/kg are considered corrosive to embedded reinforcing steel; and, as such, the concrete mix design shall be adjusted accordingly by a qualified corrosion engineer.

The sulfate ion concentration is 91 mg/kg and is determined to be insufficient to damage reinforced concrete structures and cement mortar-coated steel at this location.

The sulfide ion concentration reflects none detected with a reporting limit of 50 mg/kg.

The pH of the soil is 8.39, which does not present corrosion problems for buried iron, steel, mortar-coated steel and reinforced concrete structures.

The redox potential is +230-mV and is indicative of potentially "slightly corrosive" soils resulting from anaerobic soil conditions.

This corrosivity evaluation is based on general corrosion engineering standards and is non-specific in nature. For specific long-term corrosion control design recommendations or consultation, please call *JDH Corrosion Consultants, Inc. at (925) 927-6630.*

We appreciate the opportunity of working with you on this project. If you have any questions, or if you require further information, please do not hesitate to contact us.

Very truly yours,
CERCO ANALYTICAL, INC.

for

J. Darby Howard, Jr., P.E.
President

JDH/jdl
Enclosure

CERCO analytical
1100 Willow Pass Court, Suite A
Concord, CA 94520-1006
925 462 2771 Fax. 925 462 2775
www.cercoanalytical.com

Client: Kleinfelder
Client's Project No.: 25000566.002A
Client's Project Name: Sand Processing Plant Pier 92
Date Sampled: 24-Jun-2024
Date Received: 8-Jul-2024
Matrix: Soil
Authorization: Chain of Custody

Date of Report: 15-Jul-2024

Job/Sample No.	Sample I.D.	Redox (mV)	pH	Resistivity (As Received) (ohms-cm)	Resistivity (100% Saturation) (ohms-cm)	Sulfide (mg/kg)*	Chloride (mg/kg)*	Sulfate (mg/kg)*
2407011-001	B-1 @ 5-6.5'	+230	8.39	-	340	N.D.	470	91

Method:	ASTM D1498	ASTM D4972	ASTM G57	ASTM G57	ASTM D4658M	ASTM D4327	ASTM D4327
Reporting Limit:	-	-	-	-	50	15	15
Date Analyzed:	9-Jul-2024	9-Jul-2024	-	9-Jul-2024	12-Jul-2024	9-Jul-2024	9-Jul-2024

* Results Reported on "As Received" Basis
N.D. - None Detected

Julia Clauson
Chemist

Quality Control Summary - **All laboratory quality control parameters were found to be within established limits**

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PREVIOUS BORING LOGS AND LABORATORY TEST RESULTS

Appendix C



REFERENCE:
VICINITY MAP CREATED FROM DATA COMPILED BY USGS US TOPO SOUTH SAN FRANCISCO & HUNTERS POINT QUADRANGLES CALIFORNIA, 7.5-MINUTE SERIES, Both Dated 2015.

0 1500 3000

SCALE: 1" = 1500' SCALE IN FEET

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PROJECT NO.	20182650
DRAWN BY:	JDS
CHECKED BY:	CN
DATE:	01/19/2018
REVISED:	

SITE VICINITY MAP

PROJECT SUNSET
PIER 94
SANFRANCISCO, CALIFORNIA

FIGURE
1

PLOTTED: 1/19/2018 1:40 PM BY: jeff sala
CAD FILE: W:\2018\20182650.001A-Pier 94 Sunset Project\GRAPHICs\20182650.dwg

PLOTTED: 1/19/2018 1:39 PM BY: jeff sala
CAD FILE: W:\20182\20182650.001A-Pier 94 Sunset Project\GRAPHICs\20182650.dwg LAYOUT: SP



LEGEND

SOIL BORING

0 120 240

SCALE: 1" = 120' SCALE IN FEET

REFERENCE:
BASE MAPPING CREATED FROM THE FOLLOWING:
PLAN TITLED "HANSON AGGREGATES PIER 94 TOPOGRAPHY", DATED: 10-06-2017, AND PREPARED BY SAN FRANCISCO PORT COMMISSION, DEPARTMENT OF ENGINEERING;

IMAGE CREATED FROM DATA COMPILED BY GOOGLE EARTH PRO., IMAGE DATE 09-01-2017.

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DATE:	01/19/2018
REVISED:	

SITE PLAN

PROJECT SUNSET
PIER 94
SANFRANCISCO, CALIFORNIA

FIGURE
2

SAMPLER AND DRILLING METHOD GRAPHICS



BULK / GRAB / BAG SAMPLE

MODIFIED CALIFORNIA SAMPLER
(2 or 2-1/2 in. (50.8 or 63.5 mm.) outer diameter)

CALIFORNIA SAMPLER
(3 in. (76.2 mm.) outer diameter)

STANDARD PENETRATION SPLIT SPOON SAMPLER
(2 in. (50.8 mm.) outer diameter and 1-3/8 in. (34.9 mm.) inner diameter)

SHELBY TUBE SAMPLER

HOLLOW STEM AUGER

SOLID STEM AUGER

WASH BORING

GROUND WATER GRAPHICS

WATER LEVEL (level where first observed)

WATER LEVEL (level after exploration completion)

WATER LEVEL (additional levels after exploration)

OBSERVED SEEPAGE

NOTES

- The report and graphics key are an integral part of these logs. All data and interpretations in this log are subject to the explanations and limitations stated in the report.
- Lines separating strata on the logs represent approximate boundaries only. Actual transitions may be gradual or differ from those shown.
- No warranty is provided as to the continuity of soil or rock conditions between individual sample locations.
- Logs represent general soil or rock conditions observed at the point of exploration on the date indicated.
- In general, Unified Soil Classification System designations presented on the logs were based on visual classification in the field and were modified where appropriate based on gradation and index property testing.
- Fine grained soils that plot within the hatched area on the Plasticity Chart, and coarse grained soils with between 5% and 12% passing the No. 200 sieve require dual USCS symbols, ie., GW-GM, GP-GM, GW-GC, GP-GC, GC-GM, SW-SM, SP-SM, SW-SC, SP-SC, SC-SM.
- If sampler is not able to be driven at least 6 inches then 50/X indicates number of blows required to drive the identified sampler X inches with a 140 pound hammer falling 30 inches.

ABBREVIATIONS
WOH - Weight of Hammer
WOR - Weight of Rod

UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D 2487)

COARSE GRAINED SOILS (More than half of material is larger than the #200 sieve)	**GRAVELS** (More than half of coarse fraction is larger than the #4 sieve)	CLEAN GRAVEL WITH <5% FINES	Cu ≥4 and 1≤ Cc≤3		**GW**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
			Cu <4 and/ or 1>Cc >3		**GP**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE OR NO FINES
		GRAVELS WITH 5% TO 12% FINES	Cu ≥4 and 1≤ Cc≤3		**GW-GM**	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
					GW-GC	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
			Cu <4 and/ or 1>Cc >3		**GP-GM**	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE FINES
					GP-GC	POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES WITH LITTLE CLAY FINES
		GRAVELS WITH > 12% FINES			**GM**	SILTY GRAVELS, GRAVEL-SILT-SAND MIXTURES
					GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
					GC-GM	CLAYEY GRAVELS, GRAVEL-SAND-CLAY-SILT MIXTURES
	SANDS (More than half of coarse fraction is smaller than the #4 sieve)	CLEAN SANDS WITH <5% FINES	Cu ≥6 and 1≤ Cc≤3		**SW**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
			Cu <6 and/ or 1>Cc >3		**SP**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE OR NO FINES
		SANDS WITH 5% TO 12% FINES	Cu ≥6 and 1≤ Cc≤3		**SW-SM**	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
					SW-SC	WELL-GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
			Cu <6 and/ or 1>Cc >3		**SP-SM**	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE FINES
					SP-SC	POORLY GRADED SANDS, SAND-GRAVEL MIXTURES WITH LITTLE CLAY FINES
		SANDS WITH > 12% FINES			**SM**	SILTY SANDS, SAND-GRAVEL-SILT MIXTURES
					SC	CLAYEY SANDS, SAND-GRAVEL-CLAY MIXTURES
					SC-SM	CLAYEY SANDS, SAND-SILT-CLAY MIXTURES

FINE GRAINED SOILS (More than half of material is smaller than the #200 sieve)	SILTS AND CLAYS (Liquid Limit less than 50)	**ML**	INORGANIC SILTS AND VERY FINE SANDS, SILTY OR CLAYEY FINE SANDS, SILTS WITH SLIGHT PLASTICITY
		CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		CL-ML	INORGANIC CLAYS-SILTS OF LOW PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		OL	ORGANIC SILTS & ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS (Liquid Limit greater than 50)	**MH**	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILT
		CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
		OH	ORGANIC CLAYS & ORGANIC SILTS OF MEDIUM-TO-HIGH PLASTICITY

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PROJECT NO.:	20182650
DRAWN BY:	JDS
CHECKED BY:	FO
DATE:	1/12/2018
REVISED:	-

GRAPHICS KEY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

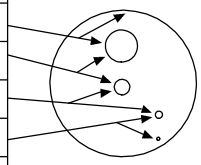
FIGURE

A-1

PLOTTED: 01/15/2018 11:38 AM BY: JSala
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PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
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GRAIN SIZE

DESCRIPTION		SIEVE SIZE	GRAIN SIZE	APPROXIMATE SIZE
Boulders		>12 in. (304.8 mm.)	>12 in. (304.8 mm.)	Larger than basketball-sized
Cobbles		3 - 12 in. (76.2 - 304.8 mm.)	3 - 12 in. (76.2 - 304.8 mm.)	Fist-sized to basketball-sized
Gravel	coarse	3/4 -3 in. (19 - 76.2 mm.)	3/4 -3 in. (19 - 76.2 mm.)	Thumb-sized to fist-sized
	fine	#4 - 3/4 in. (#4 - 19 mm.)	0.19 - 0.75 in. (4.8 - 19 mm.)	Pea-sized to thumb-sized
Sand	coarse	#10 - #4	0.079 - 0.19 in. (2 - 4.9 mm.)	Rock salt-sized to pea-sized
	medium	#40 - #10	0.017 - 0.079 in. (0.43 - 2 mm.)	Sugar-sized to rock salt-sized
	fine	#200 - #40	0.0029 - 0.017 in. (0.07 - 0.43 mm.)	Flour-sized to sugar-sized
Fines		Passing #200	<0.0029 in. (<0.07 mm.)	Flour-sized and smaller



SECONDARY CONSTITUENT

	AMOUNT	
Term of Use	Secondary Constituent is Fine Grained	Secondary Constituent is Coarse Grained
Trace	<5%	<15%
With	≥5 to <15%	≥15 to <30%
Modifier	≥15%	≥30%

MOISTURE CONTENT

DESCRIPTION	FIELD TEST
Dry	Absence of moisture, dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water, usually soil is below water table

CEMENTATION

DESCRIPTION	FIELD TEST
Weakly	Crumbles or breaks with handling or slight finger pressure
Moderately	Crumbles or breaks with considerable finger pressure
Strongly	Will not crumble or break with finger pressure

CONSISTENCY - FINE-GRAINED SOIL

CONSISTENCY	SPT - N_{60} (# blows / ft)	Pocket Pen (tsf)	UNCONFINED COMPRESSIVE STRENGTH (Q_u)(psf)	VISUAL / MANUAL CRITERIA
Very Soft	<2	PP < 0.25	<500	Thumb will penetrate more than 1 inch (25 mm). Extrudes between fingers when squeezed.
Soft	2 - 4	0.25≤ PP <0.5	500 - 1000	Thumb will penetrate soil about 1 inch (25 mm). Remolded by light finger pressure.
Medium Stiff	4 - 8	0.5≤ PP <1	1000 - 2000	Thumb will penetrate soil about 1/4 inch (6 mm). Remolded by strong finger pressure.
Stiff	8 - 15	1≤ PP <2	2000 - 4000	Can be imprinted with considerable pressure from thumb.
Very Stiff	15 - 30	2≤ PP <4	4000 - 8000	Thumb will not indent soil but readily indented with thumbnail.
Hard	>30	4≤ PP	>8000	Thumbnail will not indent soil.

FROM TERZAGHI AND PECK, 1948; LAMBE AND WHITMAN, 1969; FHWA, 2002; AND ASTM D2488

REACTION WITH HYDROCHLORIC ACID

DESCRIPTION	FIELD TEST
None	No visible reaction
Weak	Some reaction, with bubbles forming slowly
Strong	Violent reaction, with bubbles forming immediately

APPARENT / RELATIVE DENSITY - COARSE-GRAINED SOIL

APPARENT DENSITY	SPT-N_{60} (# blows/ft)	MODIFIED CA SAMPLER (# blows/ft)	CALIFORNIA SAMPLER (# blows/ft)	RELATIVE DENSITY (%)
Very Loose	<4	<4	<5	0 - 15
Loose	4 - 10	5 - 12	5 - 15	15 - 35
Medium Dense	10 - 30	12 - 35	15 - 40	35 - 65
Dense	30 - 50	35 - 60	40 - 70	65 - 85
Very Dense	>50	>60	>70	85 - 100

FROM TERZAGHI AND PECK, 1948

PLASTICITY

DESCRIPTION	LL	FIELD TEST
Non-plastic	NP	A 1/8-in. (3 mm.) thread cannot be rolled at any water content.
Low (L)	< 30	The thread can barely be rolled and the lump or thread cannot be formed when drier than the plastic limit.
Medium (M)	30 - 50	The thread is easy to roll and not much time is required to reach the plastic limit. The thread cannot be rerolled after reaching the plastic limit. The lump or thread crumbles when drier than the plastic limit.
High (H)	> 50	It takes considerable time rolling and kneading to reach the plastic limit. The thread can be rerolled several times after reaching the plastic limit. The lump or thread can be formed without crumbling when drier than the plastic limit.

STRUCTURE

DESCRIPTION	CRITERIA
Stratified	Alternating layers of varying material or color with layers at least 1/4-in. thick, note thickness.
Laminated	Alternating layers of varying material or color with the layer less than 1/4-in. thick, note thickness.
Fissured	Breaks along definite planes of fracture with little resistance to fracturing.
Slickensided	Fracture planes appear polished or glossy, sometimes striated.
Blocky	Cohesive soil that can be broken down into small angular lumps which resist further breakdown.
Lensed	Inclusion of small pockets of different soils, such as small lenses of sand scattered through a mass of clay; note thickness.

ANGULARITY

DESCRIPTION	CRITERIA
Angular	Particles have sharp edges and relatively plane sides with unpolished surfaces.
Subangular	Particles are similar to angular description but have rounded edges.
Subrounded	Particles have nearly plane sides but have well-rounded corners and edges.
Rounded	Particles have smoothly curved sides and no edges.

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PROJECT NO.:	20182650
DRAWN BY:	JDS
CHECKED BY:	FO
DATE:	1/12/2018
REVISED:	-

SOIL DESCRIPTION KEY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE

A-2

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PROJECT NUMBER: 20182650.001A
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OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [LEGEND 3 (ROCK DESC KEY)]

INFILLING TYPE

NAME	ABBR	NAME	ABBR
Albite	Al	Muscovite	Mus
Apatite	Ap	None	No
Biotite	Bi	Pyrite	Py
Clay	Cl	Quartz	Qz
Calcite	Ca	Sand	Sd
Chlorite	Ch	Sericite	Ser
Epidote	Ep	Silt	Si
Iron Oxide	Fe	Talc	Ta
Manganese	Mn	Unknown	Uk

DENSITY/SPACING OF DISCONTINUITIES

DESCRIPTION	SPACING CRITERIA
Unfractured	>6 ft. (>1.83 meters)
Slightly Fractured	2 - 6 ft. (0.061 - 1.83 meters)
Moderately Fractured	8 in - 2 ft. (203.20 - 609.60 mm)
Highly Fractured	2 - 8 in (50.80 - 203.30 mm)
Intensely Fractured	<2 in (<50.80 mm)

ADDITIONAL TEXTURAL ADJECTIVES

DESCRIPTION	RECOGNITION
Pit (Pitted)	Pinhole to 0.03 ft. (3/8 in.) (>1 to 10 mm.) openings
Vug (Vuggy)	Small openings (usually lined with crystals) ranging in diameter from 0.03 ft. (3/8 in.) to 0.33 ft. (4 in.) (10 to 100 mm.)
Cavity	An opening larger than 0.33 ft. (4 in.) (100 mm.), size descriptions are required, and adjectives such as small, large, etc., may be used
Honeycombed	If numerous enough that only thin walls separate individual pits or vugs, this term further describes the preceding nomenclature to indicate cell-like form.
Vesicle (Vesicular)	Small openings in volcanic rocks of variable shape and size formed by entrapped gas bubbles during solidification.

ADDITIONAL TEXTURAL ADJECTIVES

DESCRIPTION	CRITERIA
Unweathered	No evidence of chemical / mechanical alternation; rings with hammer blow.
Slightly Weathered	Slight discoloration on surface; slight alteration along discontinuities; <10% rock volume altered.
Moderately Weathered	Discoloring evident; surface pitted and alteration penetration well below surface; Weathering "halos" evident; 10-50% rock altered.
Highly Weathered	Entire mass discolored; Alteration pervading most rock, some slight weathering pockets; some minerals may be leached out.
Decomposed	Rock reduced to soil with relic rock texture/structure; Generally molded and crumbled by hand.

RELATIVE HARDNESS / STRENGTH DESCRIPTIONS

GRADE		UCS (Mpa)	FIELD TEST
R0	Extremely Weak	0.25 - 1.0	Indented by thumbnail
R1	Very Weak	1.0 - 5.0	Crumbles under firm blows of geological hammer, can be peeled by a pocket knife.
R2	Weak	5.0 - 25	Can be peeled by a pocket knife with difficulty, shallow indentations made by firm blow with point of geological hammer.
R3	Medium Strong	25 - 50	Cannot be scraped or peeled with a pocket knife, specimen can be fractured with a single firm blow of a geological hammer.
R4	Strong	50 - 100	Specimen requires more than one blow of geological hammer to fracture it.
R5	Very Strong	100 - 250	Specimen requires many blows of geological hammer to fracture it.
R6	Extremely Strong	> 250	Specimen can only be chipped with a geological hammer.

ROCK QUALITY DESIGNATION (RQD)

DESCRIPTION	RQD (%)
Very Poor	0 - 25
Poor	25 - 50
Fair	50 - 75
Good	75 - 90
Excellent	90 - 100

APERTURE

DESCRIPTION	CRITERIA [in (mm)]
Tight	<0.04 (<1)
Open	0.04 - 0.20 (1 - 5)
Wide	>0.20 (>5)

BEDDING CHARACTERISTICS

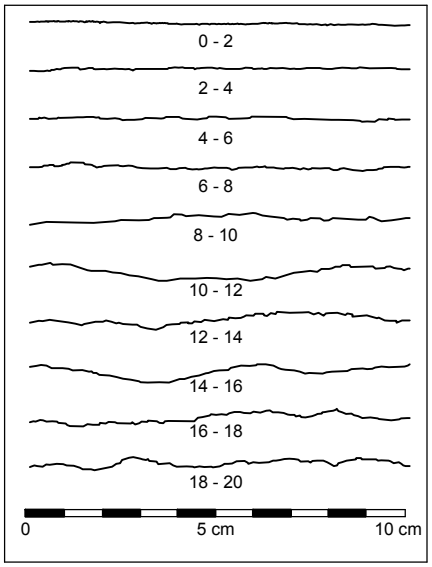
DESCRIPTION	Thickness [in (mm)]
Very Thick Bedded	>36 (>915)
Thick Bedded	12 - 36 (305 - 915)
Moderately Bedded	4 - 12 (102 - 305)
Thin Bedded	1 - 4 (25 - 102)
Very Thin Bedded	0.4 - 1 (10 - 25)
Laminated	0.1 - 0.4 (2.5 - 10)
Thinly Laminated	<0.1 (<2.5)

Bedding Planes — Planes dividing the individual layers, beds, or stratigraphy of rocks.

Joint — Fracture in rock, generally more or less vertical or traverse to bedding.

Seam — Applies to bedding plane with unspecified degree of weather.

JOINT ROUGHNESS COEFFICIENT (JRC)



From Barton and Choubey, 1977

RQD Rock-quality designation (RQD) Rough measure of the degree of jointing or fracture in a rock mass, measured as a percentage of the drill core in lengths of 10 cm. or more.

CORE SAMPLER TYPE GRAPHICS



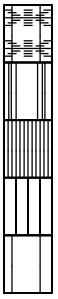
CORE SAMPLER

AQ CORE BARREL (1.067 in. (27.1 mm.) core diameter)

AX CORE BARREL (1.185 in. (30.1 mm.) core diameter)

BQ CORE BARREL (1.433 in. (36.4 mm.) core diameter)

CONTINUOUS CORE SAMPLE (2.000 in. (50.8 mm.) core diameter)



EX CORE BARREL (0.846 in. (21.5 mm.) core diameter)

HQ CORE SAMPLE (2.500 in. (63.5 mm.) core diameter)

NQ CORE SAMPLE (1.874 in. (47.6 mm.) core diameter)

NO RECOVERY CORE SAMPLE

NX CORE SAMPLE (2.154 in. (54.7 mm.) core diameter)

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ROCK DESCRIPTION KEY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE

A-3

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-1**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 550	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		SAND (SP): FILL, medium-grained sand, olive gray, moist, medium dense												Hollow Stem Auger Cased to 43'
			1		BC=11 12 12	4"								
5		concrete chunk loose	2		BC=4 5 4									
		Clayey SAND (SC): FILL, medium-grained sand, olive gray, moist, medium dense, with wood chunks, brick fragments	3A		BC=5 9 17	11"		16.4	101.3					
10			4		BC=3 2 3	3"								
					BC=1 1 3	NR"								
15		fine to medium-grained sand, wet, loose	5		BC=2 4 6	3"								
20		black wood chunks/brick			BC=12 4 4	1"								
25		**Poorly graded SAND (SP)**: FILL, fine to medium-grained sand, olive gray, wet, medium dense	6		BC=12 11 3	3"								
30		wood chunks	7A		BC=15 13 14	12"								
		Sandy CLAY (CL): medium plasticity, black, wet, very stiff												
		wood, brick												
35			8		BC=6 6 11	3"								

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BORING LOG B-1

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE

A-4

gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:43 AM BY: JSala

Date Begin - End: 11/30/2017 - 12/06/2017 **Drilling Company:** Pitcher Drilling **BORING LOG B-1**

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** Failing 550 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): YOUNG BAY MUD, medium plasticity, olive gray, moist, medium stiff	9A		BC=5 3 4	12"		53.1	71.4					0.8 ksf (TV) 0.5 ksf (PP) casing ends at 43' Mud Rotary
45														
50		high plasticity, greenish black, wet, soft	10		PT=125 PT=175 PT=200	11"								0.5 ksf (TV) 0.8 ksf (PP)
55														
60														
65		medium to high plasticity, gray, wet, soft	11A		BC=0 0 0	18"		53.4	68.6					TXUU Saturated: c = 0.53 ksf 0.8 ksf (TV) 0.8 ksf (PP)
70														
75														

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BORING LOG B-1

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE

A-4

PLOTTED: 01/19/2018 08:43 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-1**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 550	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): YOUNG BAY MUD, medium plasticity, olive gray, moist, medium stiff	12A		BC=0 0 0									0.8 ksf (TV) 1.0 ksf (PP)
85														
90														
		Fat CLAY with Sand (CH): OLD BAY MUD, fine to medium-grained sand, medium to high plasticity, greenish gray, wet, very stiff to hard												
95			13A		BC=19 19 32			14.0	115.9					4.3 ksf (TV) 4.0 ksf (PP)
100														
		Fat CLAY (CH): fine-grained sand, high plasticity, greenish gray, wet, medium stiff												
105														
110			14		PT=125 PT=185 PT=200									0.8 ksf (TV) 1.5 ksf (PP)
115														

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BORING LOG B-1

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-4

PLOTTED: 01/19/2018 08:43 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-1**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 550	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): fine-grained sand, high plasticity, greenish gray, wet, medium stiff												
125		**Clayey SAND (SC)**: fine to medium-grained sand, greenish gray, wet, dense	15A		BC=12 17 29	10"		16.0	117.7	99	46			
130														
		Fat CLAY (CH): OLD BAY MUD, greenish gray, wet, stiff												
135														
140		medium to high plasticity, soft to stiff	16		PT=150 PT=175 PT=200 PT=250	24"						80	47	TXUU Saturated: c = 1.53 ksf 0.8 ksf (TV) 0.8 ksf (PP) 0.7 ksf (TV)
145														
150		**Fat CLAY with Sand (CH)**: fine to medium-grained sand, greenish gray, wet, soft												
155			17		BC=0 0 0	18"								

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PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE

A-4

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:43 AM BY: JSala

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-1**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 550	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
165		**Fat CLAY with Sand (CH)**: fine to medium-grained sand, greenish gray, wet, soft												
170		stiff	18A		BC=0 5 7	18"		49.0	73.3					1.5 ksf (TV) 2.0 ksf (PP)
175														
180														
185		**Clayey SAND with trace Gravel (SC)**: fine to medium-grained sand, dark greenish gray, wet, loose	19		BC=5									
		Sandy Lean CLAY (CL): fine-grained sand, medium to high plasticity, dark olive gray, wet, stiff	20		BC=4 9									
190														
195														

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PROJECT SUNSET
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FIGURE
A-4

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
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PLOTTED: 01/19/2018 08:43 AM BY: JSala

Date Begin - End: 11/30/2017 - 12/06/2017 **Drilling Company:** Pitcher Drilling

BORING LOG B-1

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** Failing 550 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY with Sand (CH): fine-grained sand, medium plasticity, bluish gray, wet, hard	21A		BC=17 22 29	10"		32.0	91.0					>4.5 ksf (TV) >4.5 ksf (PP)
205														
210														
215		very stiff	22		BC=10 12 14	6"								
220														
		Clayey GRAVEL (GC): fine to coarse-grained sand, gray, wet, dense												
225		**Sandy Lean CLAY (CL)**: fine to medium-grained sand, dark olive gray, wet, dense												
230			23A		BC=18 24 35	10"		22.2	105.7	96	62			
235														

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BORING LOG B-1

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PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE

A-4

gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]
PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-1**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	Failing 550	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
														3.8 ksf (PP)
		Fat CLAY (CH): medium to high plasticity, greenish gray, wet, stiff												
245			24		BC=1 3 8	18"								
250														
255														
260		fine-grained sand, very stiff	25		PT=175 PT=225 PT=300	30"								3.0 ksf (PP)
265														
		Sandy Lean CLAY (CL): fine to medium-grained sand, greenish gray, wet, hard												
270														
275		completely weathered bedrock with angular to subangular gravel	26		BC=15 20 25	5"								
		Weathered CLAYSTONE with Sand and Gravel: greenish gray and dark gray	27		BC=25 14 30									

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BORING LOG B-1

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FIGURE
A-4

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:43 AM BY: JSala

Date Begin - End: 11/30/2017 - 12/06/2017 **Drilling Company:** Pitcher Drilling

BORING LOG B-1

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** Failing 550 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Weathered CLAYSTONE with Sand and Gravel: greenish gray and dark gray with fine angular to subangular gravel												
			28		BC=19 21 35	8"								
285		The boring was terminated at approximately 283.5 ft. below ground surface. The boring was backfilled with grout on December 06, 2017.												
290														
295														
300														
305														
310														
315														

GROUNDWATER LEVEL INFORMATION:

▽ Groundwater was observed at approximately 12.5 ft. below ground surface during drilling.

▼ Groundwater was observed at approximately 7 ft. below ground surface at the end of drilling.

GENERAL NOTES:

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BORING LOG B-1

PROJECT SUNSET
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SAN FRANCISCO, CALIFORNIA

FIGURE

A-4

PLOTTED: 01/19/2018 08:43 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-2**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
		Sandy CLAY (CL): FILL, olive, dry												Hollow Stem Auger cased to 35 feet
		Poorly graded SAND (SP): FILL, medium plasticity, olive gray, moist, dense	1		BC=4 17 14	5"								
5		**Clayey SAND (SC)**: FILL, fine to medium-grained sand, olive gray, moist, medium dense, with concrete, wood	2		BC=4 4 10	12"								
			3		BC=29 12 12	8"								
10			4C		BC=6 10 7	12"								
		wet, brick, concrete wood	5		BC=8 5 5	4"								
15		wet, chunks of wood			BC=8 9 50/5"	1"								
20		moist	6		BC=8 7 4	NR"								
25		**Lean CLAY (CL)**: medium plasticity, olive gray, wet, very stiff			BC=6 2 2	NR"								
			7		BC=0 0 0									
30		with gravel (1 2" diameter rock) and metal pieces	8C		BC=0 0 0									
35		**Fat CLAY (CH)**: medium plasticity, olive gray, moist, very stiff	9C		BC=0 0 0	12"								end of casing 0.4 ksf (TV) sampler bouncing at 36.25

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BORING LOG B-2

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-5

PLOTTED: 01/19/2018 08:44 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-2**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): medium plasticity, olive gray, moist, very stiff	10		PT=50 PP=0.3	8"								0.6 ksf (TV)
45														
50			11C		BC=0 0 0 PP=0.8	12"		67.9	60.5					0.5 ksf (TV)
55														
60			12		BC=0 0 0 PP=.8	12"								0.6 ksf (TV)
65														
70			13		BC=0 0 0 PP=1.0	6"								0.7 ksf (TV)
75														

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PROJECT NO.:	20182650
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BORING LOG B-2

PROJECT SUNSET
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SAN FRANCISCO, CALIFORNIA

FIGURE
A-5

PLOTTED: 01/19/2018 08:44 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

PLOTTED: 01/19/2018 08:45 AM BY: JSala

Date Begin - End: 11/30/2017 - 12/06/2017 **Drilling Company:** Pitcher Drilling

BORING LOG B-2

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-55 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
85		**Fat CLAY with Shells (CH)**: medium plasticity, olive gray, moist, very stiff	14C		BC=0 0 1 PP=.8	12"								0.8 ksf (TV)
90														
95			15		PP=1.8	20"								0.8 ksf (TV)
100														
105														
110		**Fat CLAY (CH)**: YOUNG BAY MUD, olive gray, wet, very stiff	16		BC=0 1 2 PP=1.0	12"		62.0	63.6					0.8 ksf (TV)
115														

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PROJECT NO.:	20182650
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BORING LOG B-2

PROJECT SUNSET
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SAN FRANCISCO, CALIFORNIA

FIGURE

A-5

gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG] PROJECT NUMBER: 20182650.001A OFFICE FILTER: OAKLAND

Date Begin - End: 11/30/2017 - 12/06/2017 **Drilling Company:** Pitcher Drilling **BORING LOG B-2**

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-55 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
125		**Fat CLAY (CH)**: YOUNG BAY MUD, olive gray, wet, very stiff	17C		BC=0 0 2 PP=1.5	12"								1.0 ksf (TV)
130		**Fat CLAY (CH)**: OLD BAY MUD, greenish gray, moist, stiff	18C		BC=0 4 8 PP=1.8	12"		42.9	76.4					1.2 ksf (TV)
135														
140			19		PP=2.0 PT=75 PT=100	22"								1.4 ksf (TV)
145														
150		**Fat CLAY (CH)**: OLD BAY MUD, high plasticity, olive gray, moist, stiff, with black and brown stains	20C		BC=3 7 9 PP=2.3	6"								1.1 ksf (TV)
155														

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BORING LOG B-2

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-5

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Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-2**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
165		**Fat CLAY (CH)**: OLD BAY MUD, high plasticity, olive gray, moist, stiff, with black and brown stains												
		Fat CLAY (CH): high plasticity, olive gray, moist, stiff, medium grain size shells	21		BC=0 6 9 PP=2.8	12"								1.4 ksf (TV)
170														
175		with sand below 177 feet												sand in cuttings ar 177 feet
180		**Poorly graded SAND with Gravel (SP)**: fine to medium-grained sand, greenish black, wet, very dense	22		BC=34 50/4"									
185														
		Lean CLAY (CL): high plasticity, greenish gray, moist, hard												old bay mud in cuttings at 187 feet
190														
195			23		BC=15 24 31 PP=4.5	10"		21.5	103.6					TXUU Saturated: c = 1.08 ksf

KLEINFELDER *Bright People. Right Solutions.*	PROJECT NO.: 20182650 DRAWN BY: JDS CHECKED BY: FO DATE: 1/12/2018 REVISED: -	BORING LOG B-2 PROJECT SUNSET PIER 94 SAN FRANCISCO, CALIFORNIA	FIGURE A-5 PAGE: 5 of 7

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Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-2**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
205		**Lean CLAY (CL)**: high plasticity, greenish gray, moist, hard												
210			24C		BC=5 8 14 PP=3.3	12"								2.5 ksf (TV)
215														
220														
225			25C		BC=12 21 27 PP=2.8	12"								1.9 ksf (TV)
230														
235														

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BORING LOG B-2

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-5

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Date Begin - End:	11/30/2017 - 12/06/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-2**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
		Fat CLAY (CH): dark olive gray	26C		BC=5 7 11 PP=2.3	12"		60.2	65.1			99	68	2.0 ksf (TV) TXUU Saturated: c = 0.67 ksf
245														drilling slow at approximately 247 feet
250														
255		greenish gray	27		BC=4 11 18	12"								
260														
265														
270		**CLAYSTONE**: brown and greenish gray, completely weathered	28		BC=40 50/5"	3"								drilling slow more at 268.8 chattering at 271
275		The boring was terminated at approximately 274.5 ft. below ground surface. The boring was backfilled with grout on December 06, 2017.												

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 12.5 ft. below ground surface during drilling.
GENERAL NOTES:

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FIGURE
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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling	**BORING LOG B-3**
Logged By:	J. Anderson	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:** 140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary	
Weather:	Not Available	**Exploration Diameter:**		

Depth (feet)	Graphical Log	Surface Condition: Asphalt Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FILL												core top 6"
		Poorly graded SAND (SP): medium-grained sand, olive gray, moist, medium dense	1		BC=4 8 10	6"								Hollow Stem Auger, cased to 30'
5		wood fragments	2		BC=6 10 14	2"								possible transition at 1.5'- drilling sped up
		Poorly graded SAND with Gravel (SP): fine to coarse-grained sand, olive gray, moist, medium stiff, with fine to coarse gravel, trace silt	3C		BC=7 8 9	10"		10.3	121.6					
10		brick fragments	4		BC=3 5 8	4"								
▽		fine to medium-grained sand, wet, medium dense	5C		BC=6 15 7	6"	SP	17.8	100.1	64	4.8			
15					BC=1 6 1	NR"								
20		fine to medium-grained sand, olive gray, moist, loose, wood chunks, brick, plastic fines	6C		BC=0 6 7	12"								
25		wet	7		BC=3 4 3	12"								methane alarm triggered (10%) mud rotary
		FILL **CLAYSTONE**: dark bluish gray												
30			8C		BC=33 32 16	6"								end of casing
		FILL **SAND with Gravel (SP)**: medium-grained sand, olive gray, wet, medium dense												
35		loose, wood chunks in clayey sand	9		BC=3 2 4	NR"								
		YOUNG BAY MUD **Fat CLAY (CH)**: medium plasticity, dark gray, wet, medium stiff												

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PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-3**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		YOUNG BAY MUD **Fat CLAY (CH)**: medium plasticity, dark gray, wet, medium stiff	10		BC=0 2 3 PP=0.5	12"		47.1	73.3					0.6 ksf (TV)
45		medium to high plasticity, olive gray, wet, very stiff, with shell fragments	11		BC=0 0 0 PP=0.5	12"		61.7	63.4					TXUU Saturated: c = 0.58 ksf 0.6 ksf (TV)
50			12		PP=0.5									0.6 ksf (TV)
55														
60		medium plasticity, olive gray, moist, very stiff	13C		BC=0 0 0 PP=0.8	12"								0.5 ksf (TV)
65														
70			14		BC=0 0 0 PP=0.8	6"		50.5	70.2					0.6 ksf (TV)
75														

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FIGURE

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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling	**BORING LOG B-3**	
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		YOUNG BAY MUD **Fat CLAY (CH)**: medium plasticity, dark gray, wet, medium stiff	15C		BC=0 0 0 PP=0.5	12"								0.4 ksf (TV)
85														
90														
95			16		PP=0.5									0.5 ksf (TV)
100			17		BC=0 0 0 PP=0.5	12"								0.5 ksf (TV)
105														
		OLD BAY MUD **Fat CLAY (CH)**: high plasticity, very dark gray, moist, medium stiff												change in clay cuttings
110		**Clayey SAND (SC)**: medium-grained sand, greenish gray, moist, dense	18C		BC=7 20 24 PP=4.3	6"		37.4	85.7					1.5 ksf (TV)
115														
		Fat CLAY (CH): light brownish gray, moist, medium stiff												

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FIGURE
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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-3**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): light brownish gray, moist, medium stiff with few shell fragments	19C		BC=0 3 6 PP=1.5	12"								0.5 ksf (TV)
125														
130			20		PT=5.0 PP=1.5									0.9 ksf (TV)
135														
140		high plasticity, wet	21		BC=4 4 7 PP=1.5	12"								1.5 ksf (TV)
145														
150			22		BC=0 5 9 PP=2.3	12"								1.3 ksf (TV)
155														

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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-3**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
165		**Fat CLAY (CH)**: light brownish gray, moist, medium stiff	23C		BC=0 4 7 PP=2.3	12"		45.5	74.5					1.8 ksf (TV) TXUU Saturated: c = 0.84 ksf
170														
175														
180		**Fat CLAY (CH)**: high plasticity, dark olive gray, moist, stiff, with dark brown stains	24C		BC=4 8 13 PP=2.3	12"		42.8	83.1					1.8 ksf (TV)
185														
190														
195		**Sandy Fat CLAY with Gravel (CH)**: high plasticity, greenish gray, moist, hard	25		BC=20 38 36 PP=>4.5	12"								2.5 ksf (TV) gravel in cuttings

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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-3**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
205		**Sandy Fat CLAY with Gravel (CH)**: high plasticity, greenish gray, moist, hard												
210		very stiff, with trace fine subangular gravel	26		BC=8 11 15	12"					63			chattering
215														
220														
225		**Fat CLAY (CH)**: high plasticity, greenish gray, moist, very stiff, with woody organics	27		BC=7 8 22 PP=3.3	6"								1.1 ksf (TV)
230														
235		**CLAYSTONE**: black, highly weathered												drilling slowed chattering 300 psi down pressure

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FIGURE
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Date Begin - End:	11/27/2017 - 11/30/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-3**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Asphalt / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		CLAYSTONE: black, highly weathered	28		BC=26 42 50/5"									

The boring was terminated at approximately 241.5 ft. below ground surface. The boring was backfilled with grout on November 30, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 12 ft. below ground surface during drilling.
GENERAL NOTES:

245
250
255
260
265
270
275

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FIGURE
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Date Begin - End:	11/20/2017 - 11/22/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-4**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		ASPHALT: approximately 6-inches of asphalt												Hollow Stem Auger, cased to 25'
		AGGREGATE BASE: approximately 12-inches of aggregate baserock												
		FILL **Poorly graded SAND (SP)**: fine to medium-grained sand, dark gray, moist, medium dense, with wood debris	1A		BC=7 14 15	15"								
5		sand around wood			BC=14 50/5"	NR								1000 psi down to 14.5'
▽		wet, wood sampled covered in black water			BC=12 11 9	NR								
10		wood			BC=6 5 10									
					BC=5 6 2	NR								
15		FILL **Poorly graded GRAVEL with Sand (GP)**: dark gray, wet	2		BC=10 10 10	3"								0 psi fine sand & fine to coarse gravel
					BC=5 2 5									
20		decayed wood with petroleum smell			BC=6 7 9	8"								
					BC=1 3 1									
25		YOUNG BAY MUD **Fat CLAY (CH)**: high plasticity, greenish black, wet, very soft	4		BC=1 0 2 PP=0.3	18"		65.4	65.9					switching to mud rotary, no down pressure
30			5		PT=50 PP=0.3									0.39 ksf (TV)
35			6		BC=1 0 0	18"								

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BORING LOG B-4

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-7

PLOTTED: 01/19/2018 08:48 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	11/20/2017 - 11/22/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-4**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		YOUNG BAY MUD **Fat CLAY (CH)**: high plasticity, greenish black, wet, very soft	7		BC=0 0 0	18"								
45			8		PT=50 PP=0.5									1.0 ksf (TV)
50			9		BC=0 0 0 PP=0.8			66.3	59.6					0.8 ksf (TV)
55		gray	10		BC=0 0 0									
60			11		PT=50 PP=0.8	24"								0.6 ksf (TV)
65			12A		BC=0 0 0 PP=0.5	18"								0.65 ksf (TV)
70			13		BC=0 0 0	18"								
75			14		PT=50 PP=0.3									0.1 ksf (TV)

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BORING LOG B-4

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-7

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Date Begin - End:	11/20/2017 - 11/22/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-4**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY to Elastic Silt (MH): gray, wet, very soft	15A		BC=0 0 0 PP=0.5	18"								0.1 ksf (TV)
85			16A		BC=0 2 3 PP=0.3	18"		57.1	66.4					0.6 ksf (TV)
90			17		PT=50 PP=0.5	24"								0.7 ksf (TV)
95			18A		BC=0 0 0 PP=0.5	18"								0.7 ksf (TV)
100		**Fat CLAY (CH)**: high plasticity, gray, wet, very soft	19A		BC=0 3 6 PP=0.8									1.0 ksf (TV)
105		**Clayey SAND (SC)**: fine to coarse-grained sand, high plasticity, dark gray, wet, medium dense	20		BC=5 7 12 PP=2.3			26.9	97.9	99	45			driller notes more sand, drilling fluid
110		fine to medium-grained sand, bluish gray, medium dense	21		BC=9 14 13									
115		fine to medium-grained sand, gray, very dense	22A		BC=22 50/5"	10"		19.5	112.8					

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FIGURE
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PLOTTED: 01/19/2018 08:49 AM BY: JSala

Date Begin - End: 11/20/2017 - 11/22/2017 **Drilling Company:** Pitcher Drilling

BORING LOG B-4

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-55 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
		Clayey SAND (SC): fine to coarse-grained sand, high plasticity, dark gray, wet, medium dense	23		BC=15 26 44	13"								
125		**Fat CLAY (CH)**: low to medium plasticity, bluish gray, moist, very stiff	24A		BC=3 7 12 PP=3.0	17"								
130		wet, soft	25		BC=0 1 3	12"								shells
135		gray	26		BC=0 2 4 PP=2.0	17"								shells
140		medium plasticity	27		PT=100 PP=1.8									2.0 ksf (TV)
145		**Sandy Fat CLAY with Sand (CH)**: fine to medium-grained sand, dark greenish gray, wet, dense	28A		BC=7 20 32			16.1	119.9	100	51			
150		**Fat CLAY (CH)**: fine-grained sand, gray, wet, very stiff												
155			29		BC=6 9 12									sand layers, lenses observed sudden pulses, sand in drilling 157 to 204

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FIGURE
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND

Date Begin - End:	11/20/2017 - 11/22/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-4**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
		Fat CLAY (CH): fine-grained sand, gray, wet, very stiff												
165		medium to high plasticity, stiff	30A		BC=0 6 12 PP=1.8	18"								2.3 ksf (TV)
170														
175			31		BC=2 4 9	13"								
180														
185		greenish gray, wet, very stiff	32		BC=6 7 11	13"								
190														
195			33A		BC=18 20 30 PP=<4.5			25.4	100.9					3.3 ksf (TV)

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FIGURE
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PLOTTED: 01/19/2018 08:49 AM BY: JSala

Date Begin - End: 11/20/2017 - 11/22/2017 **Drilling Company:** Pitcher Drilling

BORING LOG B-4

Logged By: J. Anderson **Drill Crew:**

Hor.-Vert. Datum: Not Available **Drilling Equipment:** CME-55 **Hammer Type - Drop:** 140 lb. Auto - 30 in.

Plunge: -90 degrees **Drilling Method:** HSA/Mud Rotary

Weather: Not Available **Exploration Diameter:**

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): fine-grained sand, gray, wet, very stiff												
205		**Sandy CLAY with trace gravel (CH)**: fine to coarse-grained sand, olive yellow to olive brown, wet, hard, trace fine gravel	34		BC=14 16 20	12"								drill chatter
210														
215		light grayish brown, wet, hard	35		BC=16 20 24 PP=4.3	13"								more chattering, coarse sand 3.5 ksf (TV)
220														
225		**CLAYSTONE**: gray, wet, highly weathered	36		BC=28 50/6"	1"								
230		bluish gray to greenish gray, wet	37		BC=50/2"	1"								
235														

The boring was terminated at approximately 230 ft. below ground surface. The boring was backfilled with grout on November 22, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 6.5 ft. below ground surface during drilling.
GENERAL NOTES:

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BORING LOG B-4

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-7

Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FILL **Poorly graded SAND (SP)**: medium-grained sand, olive gray												Hollow Stem Auger cased to 20'
		medium-grained sand, moist, dense, with concrete	1		BC=10 15 24	8"								
5		black clay lens with brick	2		BC=8 11 26	12"								
		FILL **Clayey SAND (SC)**: fine-grained sand, olive gray, moist, dense, with concrete												
		with copper wire	3		BC=4 3 5									
10		copper wire, metal scraps, brick, wood fragments	4		BC=13 16 17	3"								
		Fat CLAY (CH): medium plasticity, olive green, moist, very stiff			BC=6 0 1	NR"								
15					BC=0 0 6	NR"								
20			5		BC=0 0 0									end casing, switch to mud rotary
25														
30		fine-grained sand, high plasticity, greenish gray, wet, soft to stiff	6		PP=0.8 PT=100 PT=175	30"								0.55 ksf (TV)
35														

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BORING LOG B-5

PROJECT SUNSET
PIER 94
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FIGURE
A-8

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:50 AM BY: JSala

Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
45		**Fat CLAY (CH)**: medium plasticity, olive green, moist, very stiff												
50														
55														
60		high plasticity, gray, wet, soft to stiff	7		PT=100 PP=0.8									1.1 ksf (TV)
65														
70														100 psi 300 psi
75														

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FIGURE
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Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): medium plasticity, olive green, moist, very stiff												
85														
90		high plasticity, gray, wet, soft to stiff	8		PP=0.5 PT=0 PT=100									0.4 ksf (TV)
95														
		Sandy CLAY (CH): fine to medium-grained sand, medium plasticity, gray, wet												
100														
105		**Clayey SAND (SC)**: fine-grained sand, gray to dark gray, wet, dense												
110		dark greenish gray	9		BC=12 14 18	8"								
115		fine to medium-grained sand, brown, wet												
		dark greenish gray												

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PROJECT SUNSET
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FIGURE
A-8

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Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Clayey SAND (SC): fine-grained sand, gray to dark gray, wet, dense												
		OLD BAY MUD **Fat CLAY (CH)**: fine-grained sand, medium plasticity, greenish gray, wet, stiff to very stiff												
125														
130			10		BC=7 9 15 PP=3.5	18"		30.8	86.4					TXUU Saturated: c = 0.81 ksf 1.9 ksf (TV)
135														more sand
140														less sand
145														
150		high plasticity, greenish black, wet, medium stiff, seams of brown clay throughout sample at ~1' vertical layers	11		BC=0 0 8	14"								
155														

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FIGURE
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Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		OLD BAY MUD **Fat CLAY (CH)**: fine-grained sand, medium plasticity, greenish gray, wet, stiff to very stiff												
165														
170		greenish gray, wet, medium to very stiff, with peat spots	12		PP=3.0 PT=200 PT=350							88	50	TXUU Saturated: c = 1.80 ksf 1.7 ksf (TV)
		Clayey GRAVEL with Sand (GC): fine to coarse-grained sand, greenish black, wet, dense, with sand and gravel 173' to 176'												seen in cuttings & informed by driller
175														
		Lean CLAY (CL): fine-grained sand, greenish gray, wet, stiff												
180														
		Clayey SAND (SC): coarse-grained sand, greenish gray, wet, dense												seen in cuttings
		Lean CLAY (CL): fine-grained sand, greenish gray, wet, stiff												
185														
190		fine-grained sand, medium to high plasticity, greenish gray to greenish black, wet, stiff	13		BC=0 0 12	16"		37.5	78.4					1.7 ksf (TV) 2.3 ksf (PP)
		Sandy CLAY with Gravel (SC): medium to coarse-grained sand, greenish gray, wet, dense												
195														
		Fat CLAY (CH): fine-grained sand, greenish gray, wet, stiff												

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FIGURE
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Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): fine-grained sand, greenish gray, wet, stiff												
205														
210		fine-grained sand, medium to high plasticity, bluish gray, wet, very stiff	14		BC=2 2 15	12"								
215														harder drilling
		Clayey SAND (SC): fine-grained sand, greenish gray, wet, dense												more sand and harder drilling
220			15		BC=6 9 23	6"								
225		**Fat CLAY (CH)**: fine-grained sand, medium to high plasticity, greenish gray, wet, hard												
230			16		BC=7 15 21 PP=3.8	9"		34.3	85.4					2.8 ksf (TV)
235														

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PROJECT SUNSET
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FIGURE
A-8

PLOTTED: 01/19/2018 08:50 AM BY: JSala
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gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	12/01/2017 - 12/05/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-5**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	FIELD EXPLORATION: Surface Condition: Sand / Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	LABORATORY RESULTS: USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		Fat CLAY (CH): fine-grained sand, medium to high plasticity, greenish gray, wet, hard fine-grained sand, medium to high plasticity, dark greenish gray, wet, very stiff	17		BC=0 7 13	12"								
245														
250		stiff	18		BC=0 2 7	18"								
255														
260		fine to medium-grained sand, medium to high plasticity, greenish gray, wet, medium stiff, with sand	19		BC=0 0 8	13"								
265														
270		**SERPENTINE**: weathered and week	20		BC=15 21 50/2.5"	3"								100 psi down pressure 300 psi down pressure
275					BC=50/3.5"									

The boring was terminated at approximately 275.5 ft. below ground surface. The boring was backfilled with grout on December 05, 2017.

GROUNDWATER LEVEL INFORMATION:
▽ Groundwater was observed at approximately 11 ft. below ground surface during drilling.
GENERAL NOTES:

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BORING LOG B-5

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-8

PLOTTED: 01/19/2018 08:50 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-6**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		approximate 6-inches of baserock												hand auger to 5'
		FILL **Poorly graded SAND (SP)**: medium-grained sand, olive gray, moist, loose												casing install to 25'
5		**Poorly graded SAND (SP)**: medium-grained sand, olive gray, moist, loose, with brick/wood chunks	1		BC=7 6 3	5"								switched to Hollow Stem Auger at 5'
			2C		BC=5 2 2	3"								
		FILL **Sandy GRAVEL (GP)**												
10			3		BC=12 8 5	3"								
		chunks of wood, black sludge	4C		BC=6 13 14	12"								
15		chunks of wood			BC=9 5 4	2"								
		Fat CLAY (CH): medium plasticity, olive gray, wet, very stiff												change in drilling
20					BC=1 0 0	NR"								
			5		BC=0 0 0	12"								
														switched to mud rotary
25														end of casing
30			6		PT=50 PP=0.5							49	21	TXUU Saturated: c = 0.48 ksf
														0.5 ksf (TV)
														drilling a little choppy
35			7C		BC=0 0 0 PP=0.3	12"								0.5 ksf (TV)

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BORING LOG B-6

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-9

PLOTTED: 01/19/2018 08:51 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-6**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
45		**Fat CLAY (CH)**: medium plasticity, olive gray, wet, very stiff with shells	8C		BC=0 0 0 PP=0.3	12"								0.24 ksf (TV)
50			9C		BC=0 0 0 PP=0.3	12"		67.5	60.0					0.2 ksf (TV)
55														
60		dark olive gray, with shell fragments	10C		BC=0 0 0	12"								no liners badded sample
65			11C		BC=0 0 0 PP=0.5	12"								0.4 ksf (TV)
70			12C		BC=0 0 0 PP=0.5	12"		56.2	66.8					0.6 ksf (TV)
75														

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BORING LOG B-6

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-9

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:51 AM BY: JSala

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling	**BORING LOG B-6**
Logged By:	J. Anderson	**Drill Crew:**		
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:** 140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary	
Weather:	Not Available	**Exploration Diameter:**		

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. Push Tube(PT)= psi Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
85		**Fat CLAY (CH)**: medium plasticity, olive gray, wet, very stiff	13C		BC=0 0 0 PP=0.3	12"								0.4 ksf (TV)
90			14C		BC=0 0 0 PP=0.5	12"								0.6 ksf (TV)
95														
100			15		PT=155-185 PP=0.8									stiffens at 101' 0.4 ksf (TV)
105														
110		**Sandy Lean CLAY (CL)**: fine-grained sand, high plasticity, greenish gray, moist, hard	16C		BC=12 27 28 PP=>4.5	8"		18.7	112.9			36	23	
115		fine to coarse gravel below 117'												sand and gravel in cuttings at 117'

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BORING LOG B-6

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-9

PLOTTED: 01/19/2018 08:51 AM BY: JSala
OFFICE FILTER: OAKLAND
PROJECT NUMBER: 20182650.001A
gINT FILE: Klf_gint_master_2017
gINT TEMPLATE: E:\KLF_STANDARD_GINT_LIBRARY_2017.GLB [_KLF_BORING/TEST PIT SOIL LOG]

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-6**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
125		**Sandy Lean CLAY (CL)**: fine-grained sand, high plasticity, greenish gray, moist, hard	17C		BC=0 34 50/6"	12"		12.4	123.9					
		Fat CLAY (CH): high plasticity, greenish gray, moist, medium stiff												
130			18		BC=0 1 6	6"								
		high plasticity, greenish gray, moist, medium stiff												
135														
140		high plasticity, gray, moist, stiff	19C		BC=2 6 8 PP=1.8	12"								1.5 ksf (TV)
145														
150			20C		BC=0 6 8 PP=2.3	12"								1.5 ksf (TV)
155														

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PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-9

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:51 AM BY: JSala

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-6**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
		Fat CLAY (CH): high plasticity, greenish gray, moist, medium stiff	21C		BC=1 8 10 PP=2.0	12"								1.3 ksf (TV)
165		high plasticity, dark olive gray, moist, stiff to very stiff												
170			22C		BC=2 8 11 PP=2.8	12"		49.3	72.6					1.7 ksf (TV)
175														clay softens at 178'
180		high plasticity, olive gray/greenish gray, wet, very stiff, with black and brown stains	23C		BC=4 10 7 PP=2.8	12"								
185														
190		high plasticity, brownish gray, wet, hard	24		PT=50-375 PP=4.0	24"								
195		**Lean CLAY (CL)**: brownish gray to olive gray, moist, very stiff, with sand and gravel layers												chattering at 194' sand and gravel in cuttings

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PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-9

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND
PLOTTED: 01/19/2018 08:51 AM BY: JSala

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling		**BORING LOG B-6**
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
205		**Lean CLAY (CL)**: brownish gray to olive gray, moist, very stiff, with sand and gravel layers high plasticity, brownish gray, wet, very stiff	25C		BC=18 18 25 PP=4.3	8"		29.8	92.3					
210		high plasticity, olive gray, moist	26C		BC=12 16 21 PP=3.5	12"		20.2	108.0					TXUU Saturated: c = 2.01 ksf
215		with gravel												gravel in cuttings
220														
225		greenish gray, moist, stiff, with yellow stains	27C		BC=0 7 15 PP=3.8	12"								
230														
235		**CLAYSTONE**: olive yellow, completely to highly weathered												drilling slows at 234' drilling speeds up at 234.5

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BORING LOG B-6

PROJECT SUNSET
PIER 94
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FIGURE

A-9

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PROJECT NUMBER: 20182650.001A
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BORING LOG B-6

Date Begin - End:	12/06/2017 - 12/08/2017	**Drilling Company:**	Pitcher Drilling		
Logged By:	J. Anderson	**Drill Crew:**			
Hor.-Vert. Datum:	Not Available	**Drilling Equipment:**	CME-55	**Hammer Type - Drop:**	140 lb. Auto - 30 in.
Plunge:	-90 degrees	**Drilling Method:**	HSA/Mud Rotary		
Weather:	Not Available	**Exploration Diameter:**			

Depth (feet)	Graphical Log	Lithologic Description	Sample Number	Sample Type	Blow Counts(BC)= Uncorr. Blows/6 in. / Push Tube(PT)= psi / Pocket Pen(PP)= tsf	Recovery (NR=No Recovery)	USCS Symbol	Water Content (%)	Dry Unit Wt. (pcf)	Passing #4 (%)	Passing #200 (%)	Liquid Limit	Plasticity Index (NP=NonPlastic)	Additional Tests/ Remarks
		FIELD EXPLORATION					LABORATORY RESULTS							
245		**CLAYSTONE**: olive yellow, completely to highly weathered	28		BC=50/6"									color chsnge in cutting ~1" of sample taken from cal sampler at 244'
		The boring was terminated at approximately 245.5 ft. below ground surface. The boring was backfilled with grout on December 08, 2017.												
250														
255														
260														
265														
270														
275														

GROUNDWATER LEVEL INFORMATION:
Groundwater was not observed during drilling or after completion.
GENERAL NOTES:

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BORING LOG B-6

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
A-9

gINT FILE: Klf_gint_master_2017
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PROJECT NUMBER: 20182650.001A
OFFICE FILTER: OAKLAND

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-1	8.5			16.4	101.3							
B-1	41.0			53.1	71.4							0.8 ksf (TV)
												0.5 ksf (PP)
B-1	51.5											0.5 ksf (TV)
												0.8 ksf (PP)
B-1	66.0			53.4	68.6							TXUU Saturated: c = 0.53 ksf
												0.8 ksf (TV)
												0.8 ksf (PP)
B-1	81.0											0.8 ksf (TV)
												1.0 ksf (PP)
B-1	96.0			14.0	115.9							4.3 ksf (TV)
												4.0 ksf (PP)
B-1	111.5											0.8 ksf (TV)
												1.5 ksf (PP)
B-1	126.0			16.0	117.7		99	46				
B-1	140.0	16							80	33	47	TXUU Saturated: c = 1.53 ksf
												0.8 ksf (TV)
												0.8 ksf (PP)
B-1	142.0											0.7 ksf (TV)
B-1	171.0			49.0	73.3							1.5 ksf (TV)
												2.0 ksf (PP)
B-1	200.0	21A										>4.5 ksf (TV)
												>4.5 ksf (PP)
B-1	201.0			32.0	91.0							
B-1	231.0			22.2	105.7		96	62				
B-1	240.0											3.8 ksf (PP)
B-1	241.0								99	31	68	
B-1	260.0	25										3.0 ksf (PP)

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

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PROJECT NO.:	20182650
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LABORATORY TEST RESULT SUMMARY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-1

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-2	36.0											0.4 ksf (TV)
B-2	41.5											0.6 ksf (TV)
B-2	51.0			67.9	60.5							0.5 ksf (TV)
B-2	61.0											0.6 ksf (TV)
B-2	71.5											0.7 ksf (TV)
B-2	81.0											0.8 ksf (TV)
B-2	96.5											0.8 ksf (TV)
B-2	111.0			62.0	63.6							0.8 ksf (TV)
B-2	121.0											1.0 ksf (TV)
B-2	131.0			42.9	76.4							1.2 ksf (TV)
B-2	141.5											1.4 ksf (TV)
B-2	151.0											1.1 ksf (TV)
B-2	166.0											1.4 ksf (TV)
B-2	196.0			21.5	103.6							TXUU Saturated: c = 1.08 ksf
B-2	211.0											2.5 ksf (TV)
B-2	226.0											1.9 ksf (TV)
B-2	240.0	26C										2.0 ksf (TV)
B-2	241.0			60.2	65.1				99	31	68	TXUU Saturated: c = 0.67 ksf
B-3	8.5			10.3	121.6							
B-3	13.5			17.8	100.1	76	64	4.8				
B-3	41.0			47.1	73.3							0.6 ksf (TV)
B-3	46.0			61.7	63.4							TXUU Saturated: c = 0.58 ksf
												0.6 ksf (TV)
B-3	51.5											0.6 ksf (TV)
B-3	61.0											0.5 ksf (TV)
B-3	71.0			50.5	70.2							0.6 ksf (TV)
B-3	81.0											0.4 ksf (TV)
B-3	96.5											0.5 ksf (TV)

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NA = Not Available

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LABORATORY TEST RESULT SUMMARY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-2

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-3	101.0											0.5 ksf (TV)
B-3	111.0			37.4	85.7							1.5 ksf (TV)
B-3	121.0											0.5 ksf (TV)
B-3	131.5											0.9 ksf (TV)
B-3	141.0											1.5 ksf (TV)
B-3	151.5											1.3 ksf (TV)
B-3	165.5											1.8 ksf (TV)
B-3	166.0			45.5	74.5							TXUU Saturated: c = 0.84 ksf
B-3	181.0			42.8	83.1							1.8 ksf (TV)
B-3	196.0											2.5 ksf (TV)
B-3	211.0							63				
B-3	225.0	27										1.1 ksf (TV)
B-4	26.0			65.4	65.9							
B-4	31.0											0.39 ksf (TV)
B-4	46.0											1.0 ksf (TV)
B-4	51.0			66.3	59.6							0.8 ksf (TV)
B-4	61.0											0.6 ksf (TV)
B-4	65.5											0.65 ksf (TV)
B-4	76.5											0.1 ksf (TV)
B-4	81.0											0.1 ksf (TV)
B-4	86.0			57.1	66.4							0.6 ksf (TV)
B-4	91.0											0.7 ksf (TV)
B-4	95.5											0.7 ksf (TV)
B-4	101.0											1.0 ksf (TV)
B-4	106.0			26.9	97.9		99	45				
B-4	115.5			19.5	112.8							
B-4	141.5											2.0 ksf (TV)
B-4	146.0			16.1	119.9		100	51				

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
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NA = Not Available

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LABORATORY TEST RESULT SUMMARY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-3

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-4	165.5											2.3 ksf (TV)
B-4	196.0			25.4	100.9							3.3 ksf (TV)
B-4	216.0											3.5 ksf (TV)
B-5	31.5											0.55 ksf (TV)
B-5	61.0											1.1 ksf (TV)
B-5	90.0	8										0.4 ksf (TV)
B-5	130.0	10		30.8	86.4							TXUU Saturated: c = 0.81 ksf
												1.9 ksf (TV)
B-5	170.0	12							88	38	50	TXUU Saturated: c = 1.80 ksf
												1.7 ksf (TV)
B-5	190.0	13		37.5	78.4							1.7 ksf (TV)
												2.3 ksf (PP)
B-5	230.0	16		34.3	85.4							2.8 ksf (TV)
B-6	30.0	6							49	28	21	TXUU Saturated: c = 0.48 ksf
B-6	32.0											0.5 ksf (TV)
B-6	36.0											0.5 ksf (TV)
B-6	41.0											0.24 ksf (TV)
B-6	51.0			67.5	60.0							0.2 ksf (TV)
B-6	66.0											0.4 ksf (TV)
B-6	71.0			56.2	66.8							0.6 ksf (TV)
B-6	81.0											0.4 ksf (TV)
B-6	91.0											0.6 ksf (TV)
B-6	101.5											0.4 ksf (TV)
B-6	111.0			18.7	112.9				36	13	23	
B-6	121.0			12.4	123.9							
B-6	141.0											1.5 ksf (TV)
B-6	151.0											1.5 ksf (TV)
B-6	161.0											1.3 ksf (TV)

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

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CHECKED BY: FO
DATE: 1/12/2018
REVISED: -

LABORATORY TEST RESULT SUMMARY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-4

Exploration ID	Depth (ft.)	Sample No.	Sample Description	Water Content (%)	Dry Unit Wt. (pcf)	Sieve Analysis (%)			Atterberg Limits			Additional Tests
						Passing 3/4"	Passing #4	Passing #200	Liquid Limit	Plastic Limit	Plasticity Index	
B-6	171.0			49.3	72.6							1.7 ksf (TV)
B-6	201.0			29.8	92.3							
B-6	211.0			20.2	108.0							TXUU Saturated: c = 2.01 ksf

Refer to the Geotechnical Evaluation Report or the supplemental plates for the method used for the testing performed above.
NP = NonPlastic
NA = Not Available

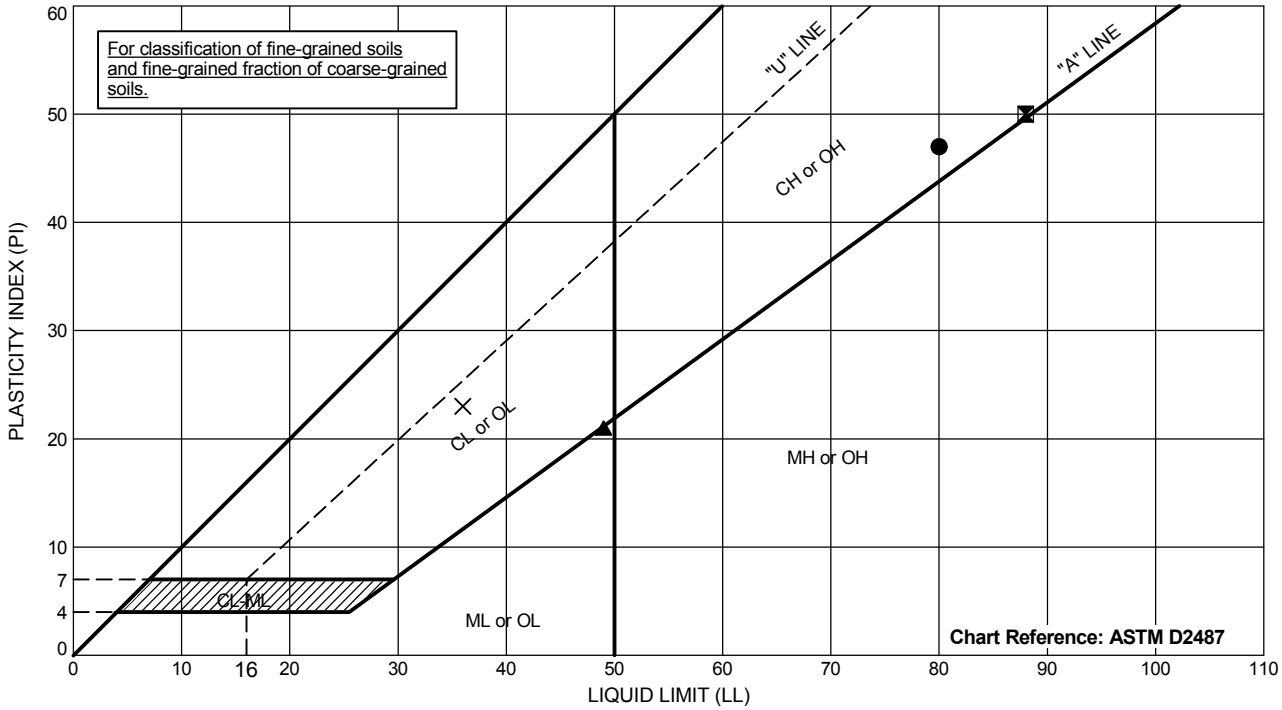
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LABORATORY TEST RESULT SUMMARY

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-5



Exploration ID		Depth (ft.)	Sample Number	Sample Description	Passing #200	LL	PL	PI
●	B-1	140	16		NM	80	33	47
⊠	B-5	170	12		NM	88	38	50
▲	B-6	30	6		NM	49	28	21
×	B-6	111	NA		NM	36	13	23

Testing performed in general accordance with ASTM D4318.
NP = Nonplastic
NA = Not Available
NM = Not Measured

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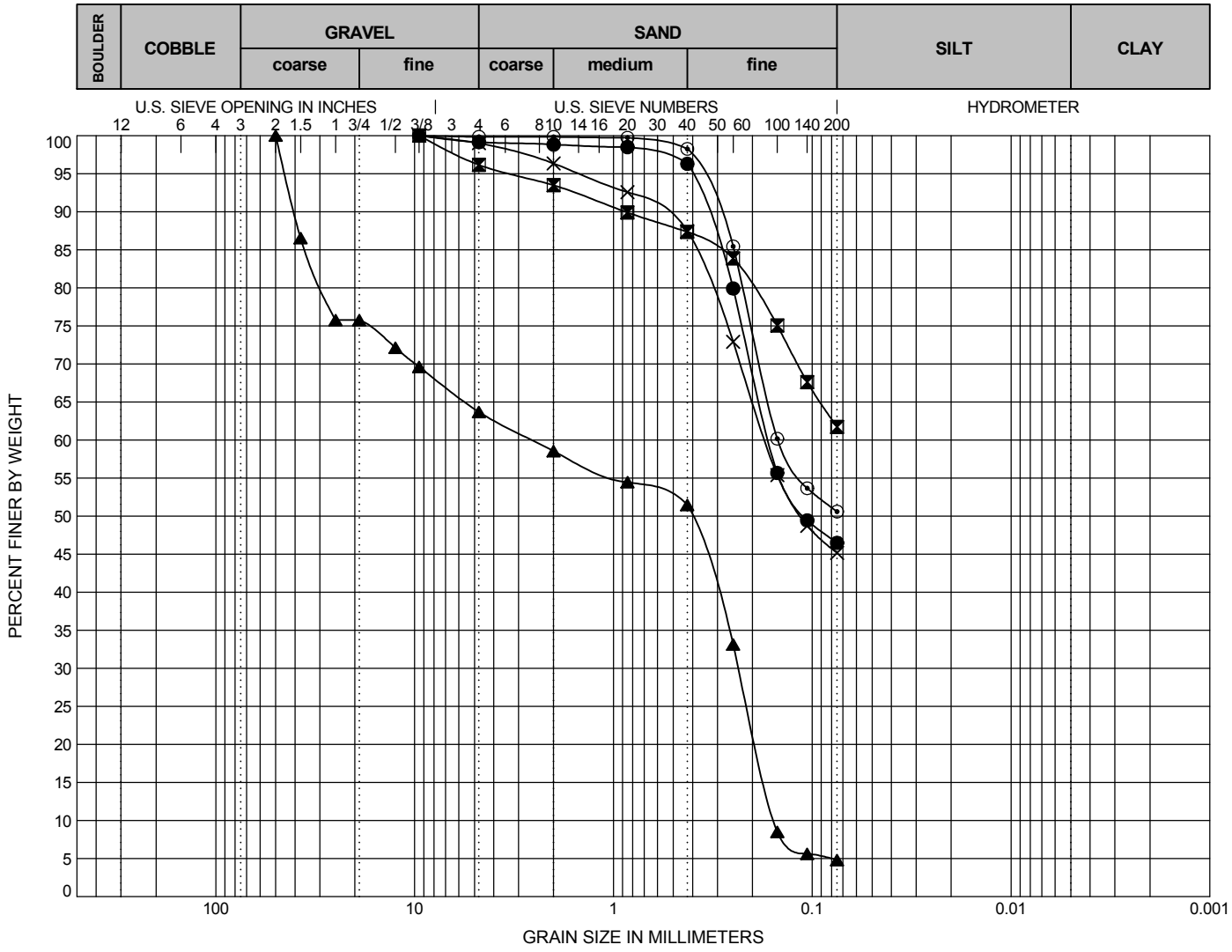
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ATTERBERG LIMITS

PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-2

PLOTTED: 01/19/2018 04:40 PM BY: JSala
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Exploration ID		Depth (ft.)	Sample Number	Sample Description	LL	PL	PI
●	B-1	126	NA	DARK OLIVE GRAY CLAYEY SAND (SC)	NM	NM	NM
⊠	B-1	231	NA	DARK OLIVE GRAY SANDY LEAN CLAY (CL)	NM	NM	NM
▲	B-3	13.5	NA	BROWN POORLY GRADED SAND WITH GRAVEL (SP) - WEATHERED GRANITE	NM	NM	NM
×	B-4	106	NA	DARK GRAY CLAYEY SAND (SC)	NM	NM	NM
⊙	B-4	146	NA		NM	NM	NM

Exploration ID		Depth (ft.)	D_{100}	D_{60}	D_{30}	D_{10}	Cc	Cu	Passing 3/4"	Passing #4	Passing #200	%Silt	%Clay
●	B-1	126	9.5	0.164	NM	NM	NM	NM		99	46	NM	NM
⊠	B-1	231	9.5	NM	NM	NM	NM	NM		96	62	NM	NM
▲	B-3	13.5	50	2.555	0.234	0.155	0.14	16.52	76	64	4.8	NM	NM
×	B-4	106	9.5	0.172	NM	NM	NM	NM		99	45	NM	NM
⊙	B-4	146	9.5	0.149	NM	NM	NM	NM		100	51	NM	NM

Sieve Analysis and Hydrometer Analysis testing performed in general accordance with ASTM D422.
NP = Nonplastic
NA = Not Available
NM = Not Measured

Coefficients of Uniformity - $C_u = D_{60} / D_{10}$
Coefficients of Curvature - $C_C = (D_{30})^2 / D_{60}\ D_{10}$
D_{60} = Grain diameter at 60% passing
D_{30} = Grain diameter at 30% passing
D_{10} = Grain diameter at 10% passing

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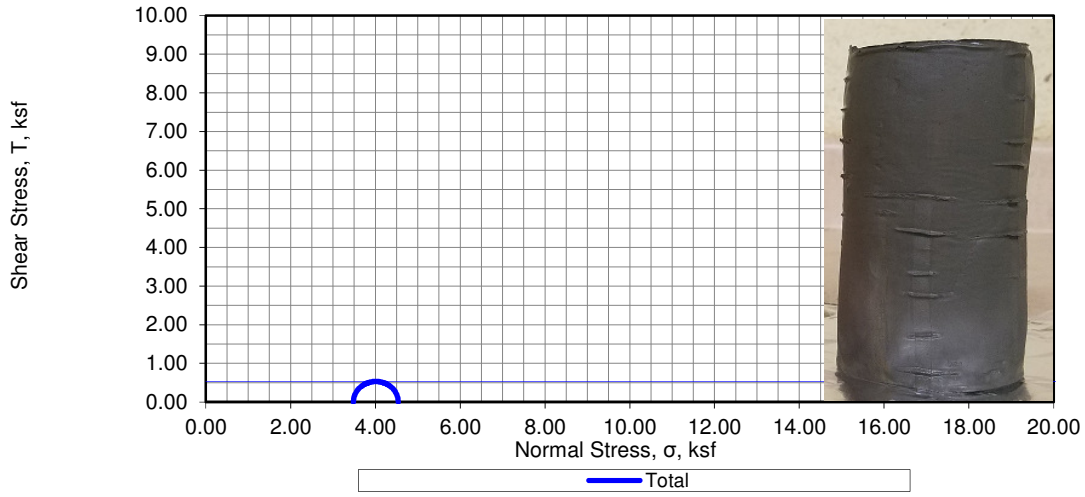
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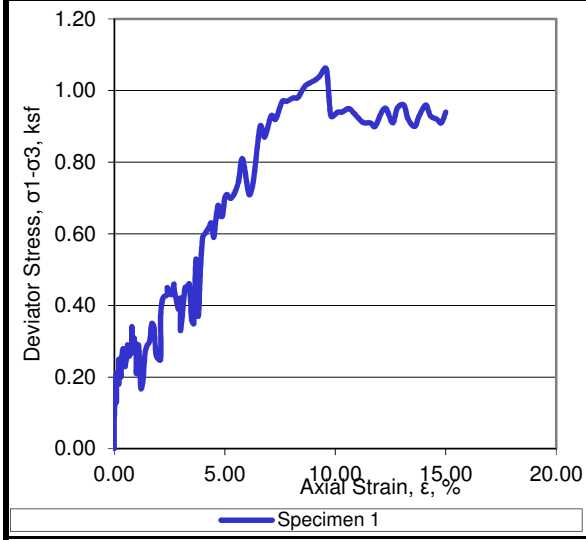
PROJECT SUNSET
PIER 94
SAN FRANCISCO, CALIFORNIA

FIGURE
B-3

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Total		
c =	0.53	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.38
	Height, in	H_O	5.83
	Water Content,	ω_O	53.4
	Dry Density, lbs	$^{\gamma}d_o$	68.6
	Saturation, %	S_O	100
	Void Ratio	e_O	1.41
Before Shear	Water Content, %	ω_f	54.7
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	67.5
	Saturation, %	S_C	100
	Void Ratio	e_C	1.45
	Final Back Pressure, ksf	U_O	4.3
Minor Principal Stress, ksf		σ_3	3.48
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	1.06
Time to $(s_1-s_3)_{max}$, min		t_f	9.6
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	0.94
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Very Dark Olive Brown Fat Clay (CH)

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.65 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-1
Sample:	11A
Depth, ft:	66
Test Date:	12/22/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.99

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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2601 Barrington Ct, Hayward, CA, 94545

Project Number:	20182650
Date:	12/29/17
Entry By:	C. Pimentel
Checked By:	C. Pimentel
File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

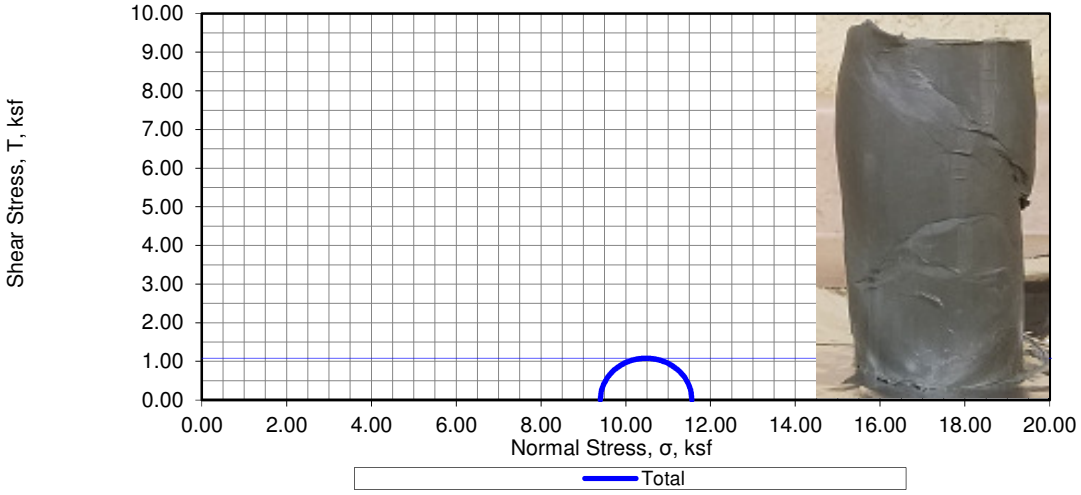
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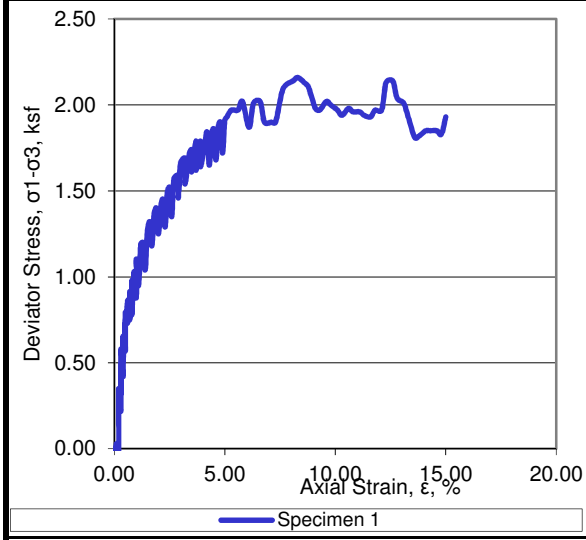
Pier 94

San Francisco, Calfornia

Plate 1 of 1

Total		
c =	1.08	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.40
	Height, in	H_O	5.74
	Water Content,	ω_O	21.5
	Dry Density, lbs	$^{\gamma}d_o$	103.6
	Saturation, %	S_O	90
	Void Ratio	e_O	0.66
Before Shear	Water Content, %	ω_f	25.7
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	100.6
	Saturation, %	S_C	100
	Void Ratio	e_C	0.71
	Final Back Pressure, ksf	U_O	4.8
Minor Principal Stress, ksf		σ_3	9.40
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	2.16
Time to $(s_1-s_3)_{max}$, min		t_f	8.3
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	1.93
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Olive Lean Clay

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.75 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-2
Sample:	23C
Depth, ft:	196
Test Date:	12/28/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.94

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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Project Number:	20182650
Date:	12/29/17
Entry By:	C. Pimentel
Checked By:	C. Pimentel
File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

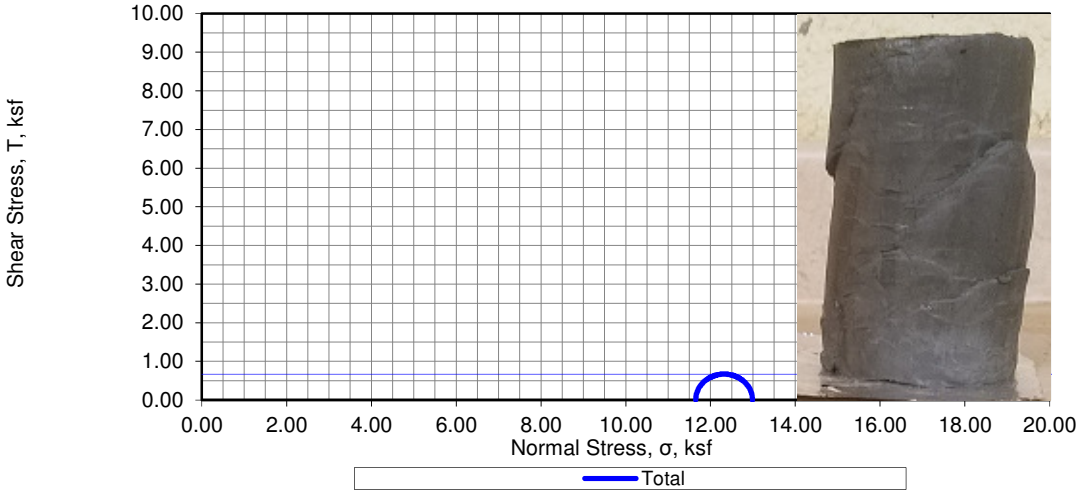
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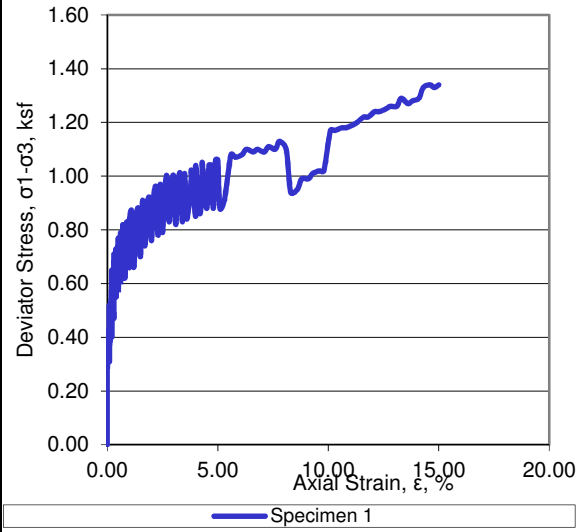
Pier 94

San Francisco, Calfornia

Plate 1 of 1

Total		
c =	0.67	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.45
	Water Content,	ω_O	60.2
	Dry Density, lbs	$^{\gamma}d_o$	65.1
	Saturation, %	S_O	100
	Void Ratio	e_O	1.64
Before Shear	Water Content, %	ω_f	65.6
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	61.2
	Saturation, %	S_C	100
	Void Ratio	e_C	1.81
	Final Back Pressure, ksf	U_O	2.7
Minor Principal Stress, ksf		σ_3	11.65
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	1.34
Time to $(s_1-s_3)_{max}$, min		t_f	14.6
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	1.34
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Very Dark Gray Fat Clay (CH)

Amount of Material Finer than the No. 200, %: nm

LL:	PL:	PI:	G_S:	Specimen Type:	Test Method:
99	31	68	2.75 Assumed	Undisturbed	ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-2
Sample:	26C
Depth, ft:	241
Test Date:	12/26/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.93

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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Project Number:	20182650
Date:	12/29/17
Entry By:	C. Pimentel
Checked By:	C. Pimentel
File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

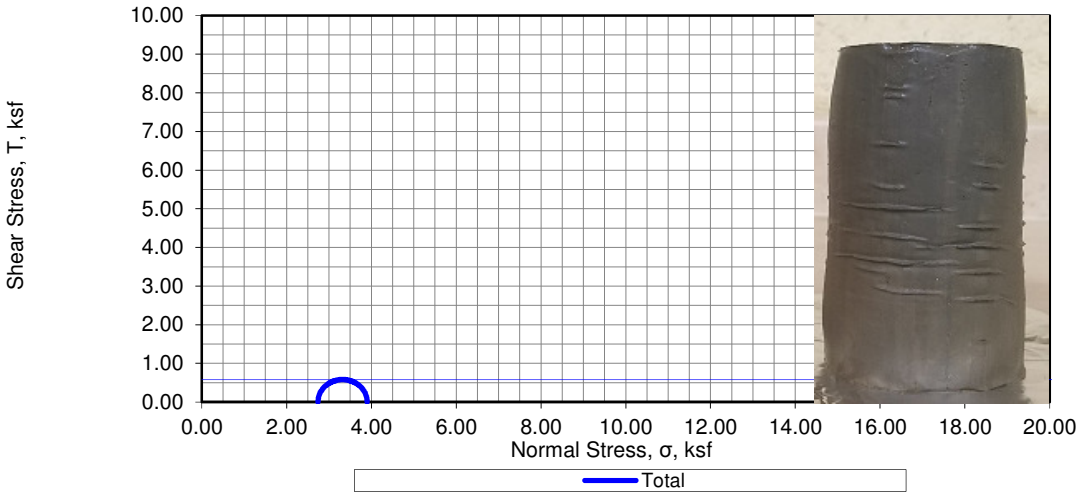
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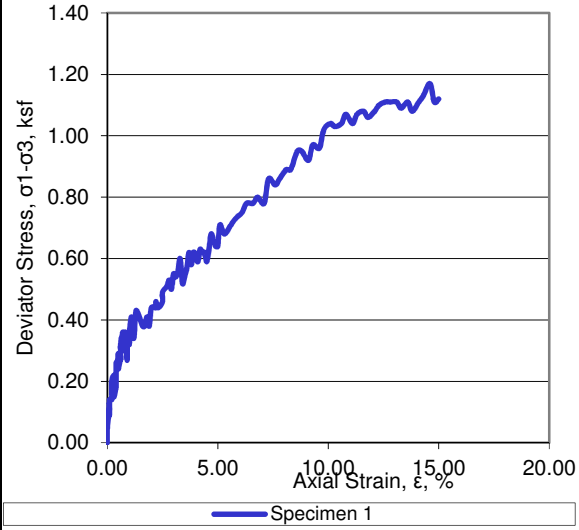
Pier 94

San Francisco, Calfornia

Plate 1 of 1

Total		
c =	0.58	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.38
	Height, in	H_O	5.21
	Water Content,	ω_O	61.7
	Dry Density, lbs	$^{\gamma}d_o$	63.4
	Saturation, %	S_O	99
	Void Ratio	e_O	1.71
Before Shear	Water Content, %	ω_f	62.3
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	63.2
	Saturation, %	S_C	100
	Void Ratio	e_C	1.71
	Final Back Pressure, ksf	U_O	2.9
Minor Principal Stress, ksf		σ_3	2.74
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	1.17
Time to $(s_1-s_3)_{max}$, min		t_f	14.6
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	1.12
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Black Fat Clay with Shells

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.75 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-3
Sample:	11C
Depth, ft:	46
Test Date:	12/22/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.97

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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Project Number:	20182650
Date:	12/29/17
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File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

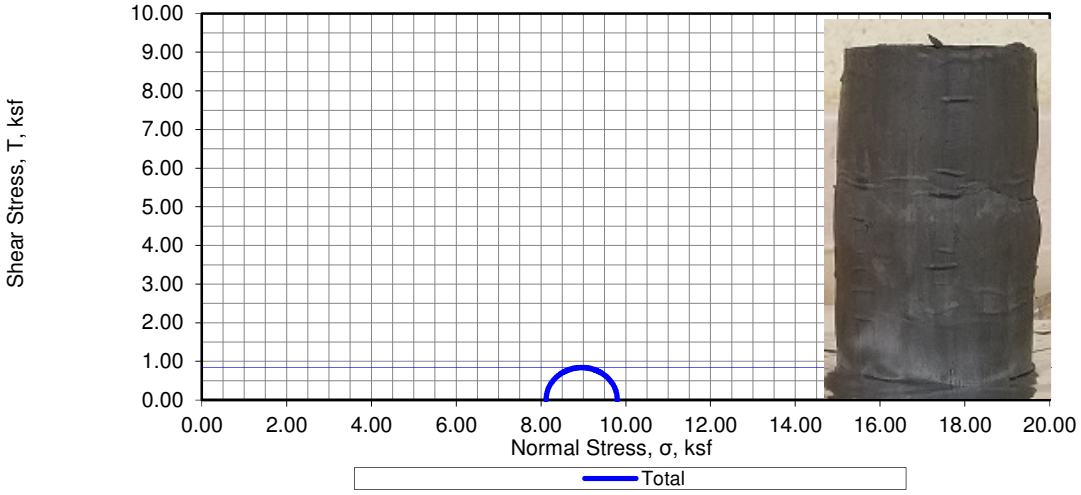
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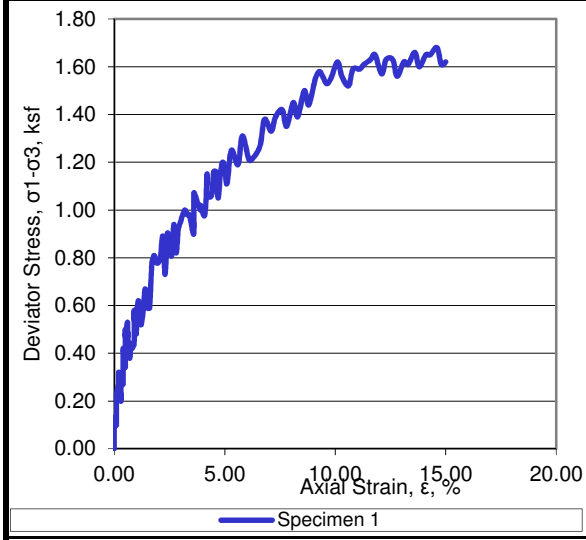
Pier 94

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Plate 1 of 1

Total		
c =	0.84	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.40
	Height, in	H_O	5.04
	Water Content,	ω_O	45.5
	Dry Density, lbs	$^{\gamma}d_o$	74.5
	Saturation, %	S_O	96
	Void Ratio	e_O	1.30
Before Shear	Water Content, %	ω_f	48.8
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	73.2
	Saturation, %	S_C	100
	Void Ratio	e_C	1.34
	Final Back Pressure, ksf	U_O	4.3
Minor Principal Stress, ksf		σ_3	8.12
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	1.68
Time to $(s_1-s_3)_{max}$, min		t_f	14.6
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	1.62
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Very Dark Gray Fat Clay (CH)

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.75 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-3
Sample:	23C
Depth, ft:	166
Test Date:	12/26/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.99

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Project Number:	20182650
Date:	12/29/17
Entry By:	C. Pimentel
Checked By:	C. Pimentel
File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

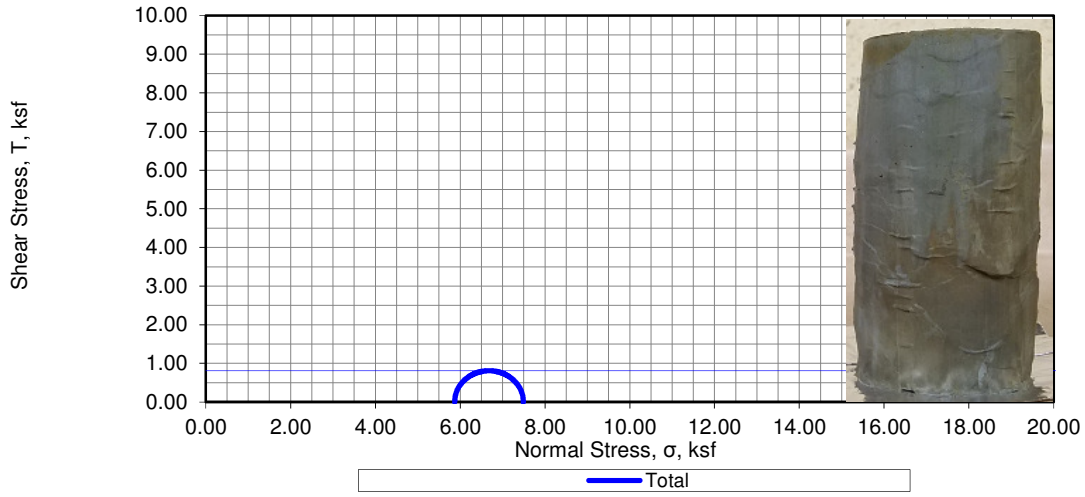
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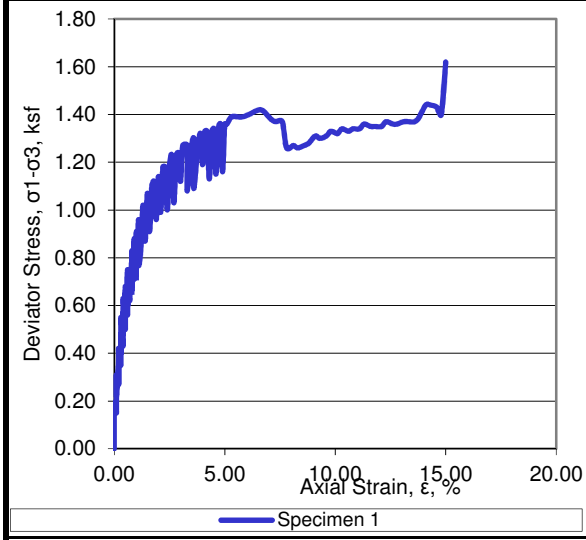
Pier 94

San Francisco, Calfornia

Plate 1 of 1

Total		
c =	0.81	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.42
	Height, in	H_O	6.00
	Water Content,	ω_O	30.8
	Dry Density, lbs	$^{\gamma}d_o$	86.4
	Saturation, %	S_O	86
	Void Ratio	e_O	0.99
Before Shear	Water Content, %	ω_f	34.0
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	88.7
	Saturation, %	S_C	100
	Void Ratio	e_C	0.94
	Final Back Pressure, ksf	U_O	5.8
Minor Principal Stress, ksf		σ_3	5.88
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	1.62
Time to $(s_1-s_3)_{max}$, min		t_f	15.0
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	1.62
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Olive Gray Lean Clay

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.75 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-5
Sample:	10A
Depth, ft:	130
Test Date:	12/28/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.99

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

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Project Number:	20182650
Date:	12/29/17
Entry By:	C. Pimentel
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File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

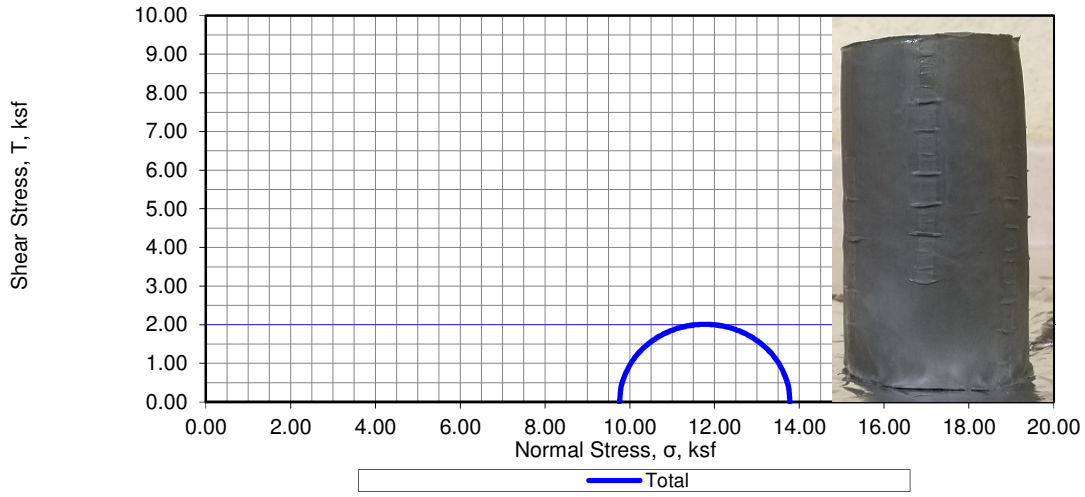
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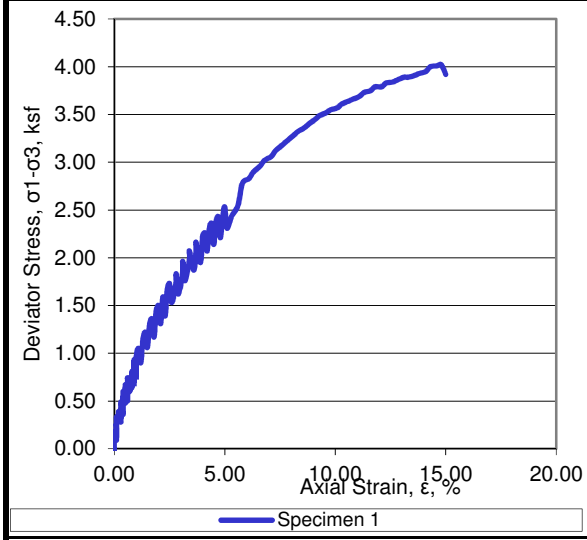
Pier 94

San Francisco, Calfornia

Plate 1 of 1

Total		
c =	2.01	ksf





Specimen No.			1
Initial	Diameter, in	D_O	2.39
	Height, in	H_O	5.65
	Water Content,	ω_O	20.2
	Dry Density, lbs	$^{\gamma}d_o$	108.0
	Saturation, %	S_O	94
	Void Ratio	e_O	0.59
Before Shear	Water Content, %	ω_f	21.2
	Dry Density, lbs/ft^3	$^{\gamma}d_c$	108.4
	Saturation, %	S_C	100
	Void Ratio	e_C	0.58
	Final Back Pressure, ksf	U_O	4.6
Minor Principal Stress, ksf		σ_3	9.76
Maximum Deviator Stress, ksf		$(\sigma1-\sigma3)_{max}$	4.02
Time to $(s_1-s_3)_{max}$, min		t_f	14.8
Deviator Stress @ 15% Axial Strain, k		$(\sigma_1-\sigma_3)_{15\%}$	3.92
Rate of strain, %/min		'ε	1.0

Method of Saturation: Wet Mounted

Description of Specimen 1: Olive Gray Lean Clay (CL)

Amount of Material Finer than the No. 200, %: nm

LL: nm	PL: nm	PI: nm	G_S: 2.75 Assumed	Specimen Type: Undisturbed	Test Method: ASTM D2850 Modified

Membrane Correction applied.

Boring:	B-6
Sample:	26C
Depth, ft:	211
Test Date:	12/28/17

Membrane and Filter Strip Correction applied. Parameter B for all Specimens >/= 0.95

The determination of strength envelopes and the development of relationships to aid in interpreting and evaluating test results are beyond the scope of this test method. Interpreted values provided herein must be evaluated and approved by the user of this report.

KLEINFELDER
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2601 Barrington Ct, Hayward, CA, 94545

Project Number:	20182650
Date:	12/29/17
Entry By:	C. Pimentel
Checked By:	C. Pimentel
File Name:	HL10878

TRIAXIAL COMPRESSION TEST (UU)

Sunset

Pier 94

San Francisco, Calfornia

Plate 1 of 1

Laboratory Test Report

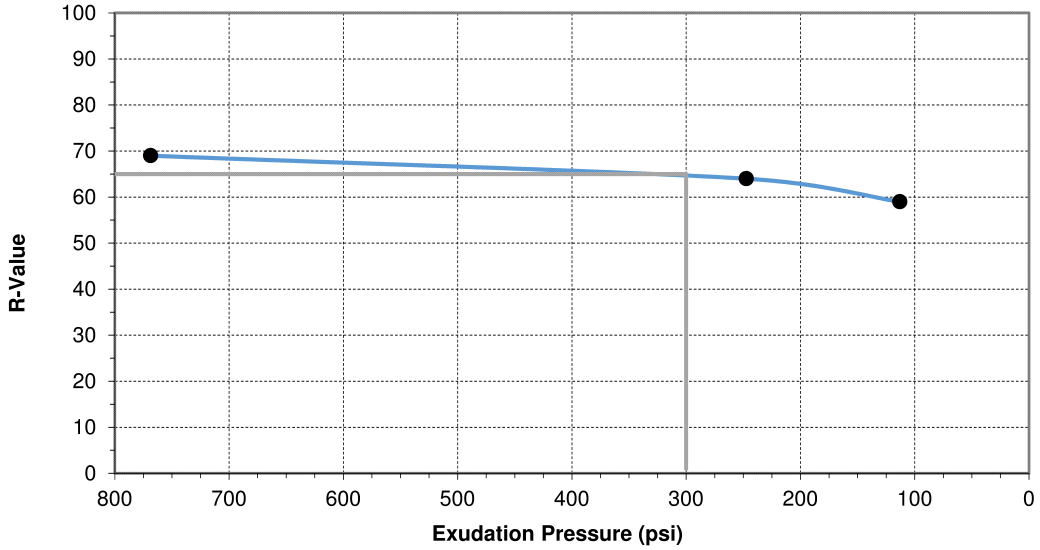
Client:	**EDG Inc.**	Report No.:	**17-HAY-02111 Rev. 0**	Issued:	**12/29/2017**
Project:	**20182650.001A**			Field ID:	**HL10886**
	Project Sunset	Sampled by:	**F. Olsen**	Date:	**12/7/2017**
	05-000L - Geotech Lab	Submitted by:	**F. Olsen**	Date:	**12/22/2017**

Tested on **12/27/2017** by **J. Savage**

Test Method: **ASTM D2844**

Material Description: **Dark Brown Sand with Gravel**

Specific Location: **B-4 @ 0-8'**



Briquette No.	A	B	C
Dry Unit Weight at Test (pcf)	124.5	122.1	125.8
Expansion Pressure (psf)	0	0	0
Exudation Pressure (psi)	769	113	247
Moisture at Time of Test (%)	8.7	10.4	9.5
Resistance Value	69	59	64
R - VALUE AT 300 PSI EXUDATION PRESSURE:			**65**

Reviewed on 12/29/2017 by Cindy Pimentel,
Senior Technician

Limitations: Pursuant to applicable building codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specifications were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet). , if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

Laboratory Test Report

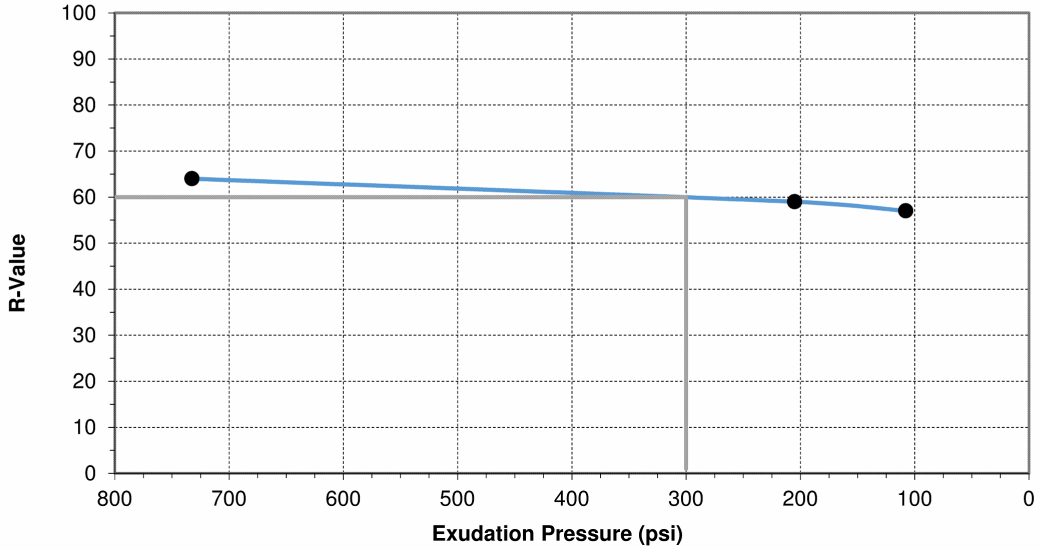
Client:	**EDG Inc.**	Report No.:	**17-HAY-02111 Rev. 0**	Issued:	**12/29/2017**
Project:	**20182650.001A**			Field ID:	**HL10886**
	Project Sunset	Sampled by:	**F. Olsen**	Date:	**12/7/2017**
	05-000L - Geotech Lab	Submitted by:	**F. Olsen**	Date:	**12/22/2017**

Tested on **12/27/2017** by **J. Savage**

Test Method: **ASTM D2844**

Material Description: **Olive Brown Sand with Gravel**

Specific Location: **B-6 Bullk**

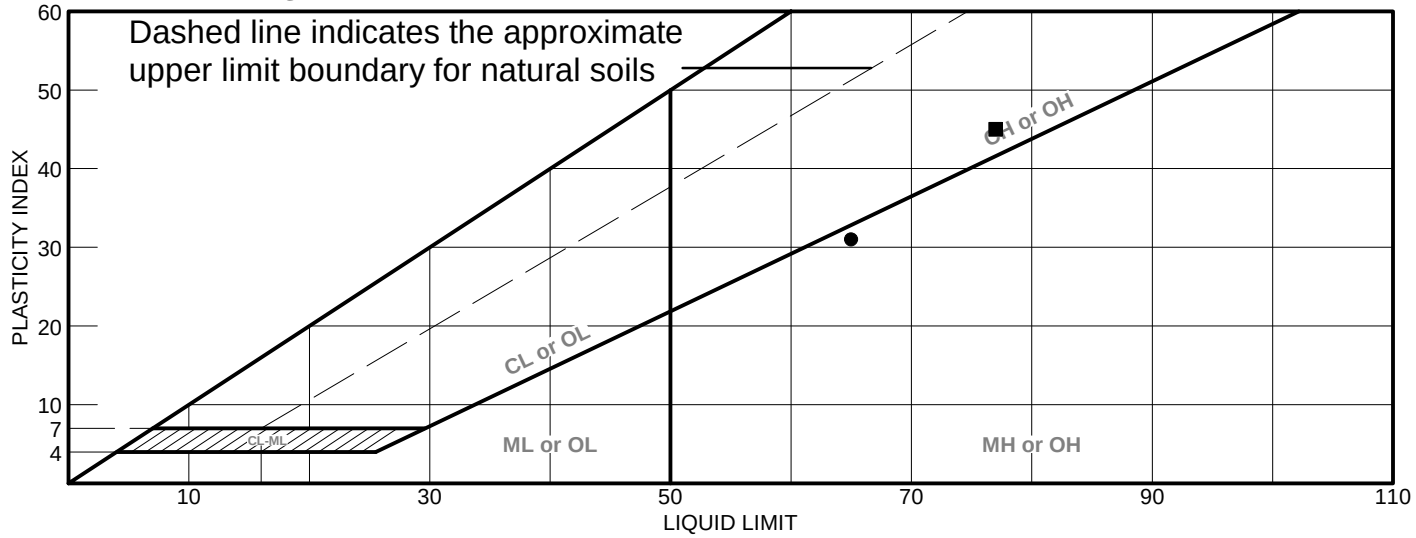


Briquette No.	A	B	C
Dry Unit Weight at Test (pcf)	114.5	111.0	113.4
Expansion Pressure (psf)	0	0	0
Exudation Pressure (psi)	732	108	205
Moisture at Time of Test (%)	10.1	14.4	12.2
Resistance Value	64	57	59
R - VALUE AT 300 PSI EXUDATION PRESSURE:			**60**

Reviewed on 12/29/2017 by Cindy Pimentel,
Senior Technician

Limitations: Pursuant to applicable building codes, the results presented in this report are for the exclusive use of the client and the registered design professional in responsible charge. The results apply only to the samples tested. If changes to the specifications were made and not communicated to Kleinfelder, Kleinfelder assumes no responsibility for pass/fail statements (meets/did not meet). , if provided. This report may not be reproduced, except in full, without written approval of Kleinfelder.

LIQUID AND PLASTIC LIMITS TEST REPORT





	MATERIAL DESCRIPTION	LL	PL	PI	%<#40	%<#200	USCS
●	Greenish Gray Elastic SILT (Bay Mud)	65	34	31			
■	Greenish Gray Fat CLAY (Bay Mud)	77	32	45			

Project No. 336-319 **Client:** Kleinfelder

Project: Sunset Project - 20182658.001A

● **Source:** B4 **Elev./Depth:** 90'

■ **Source:** B4 **Elev./Depth:** 140(Tip-4")

Remarks:

● Sample was prepared using the wet prep method.

■ Sample was prepared using the wet prep method.

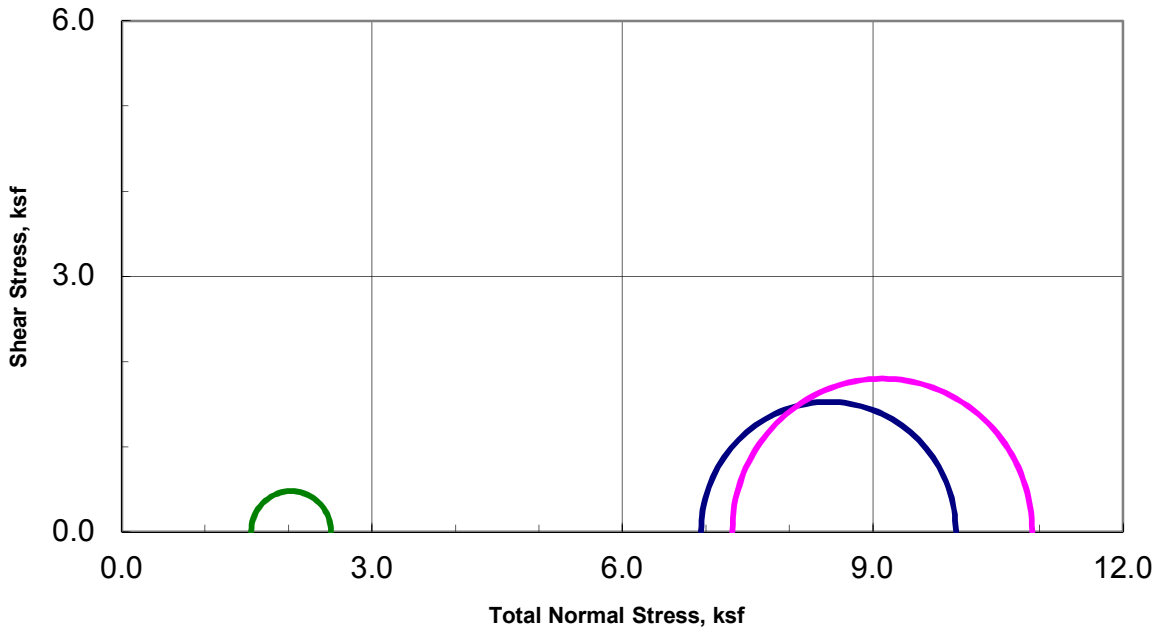
LIQUID AND PLASTIC LIMITS TEST REPORT

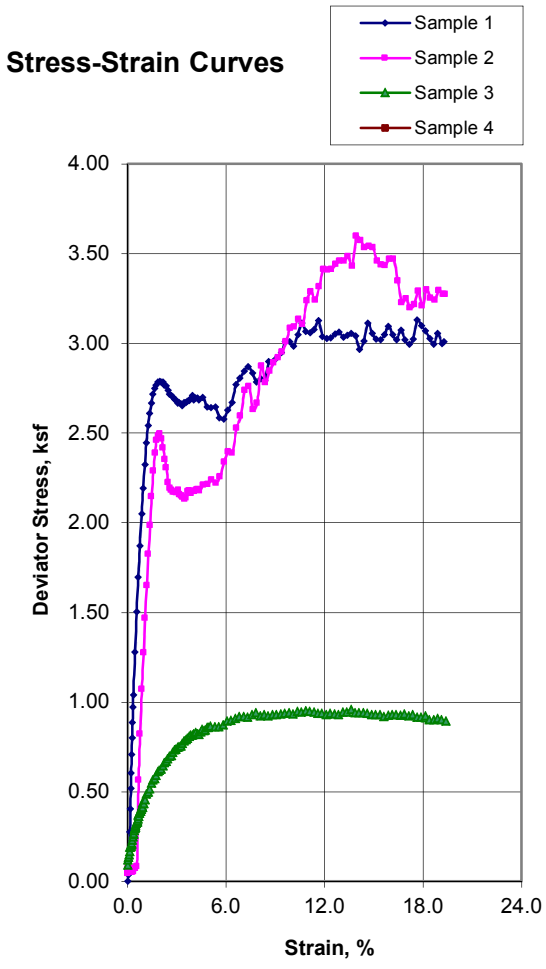
COOPER TESTING LABORATORY

Figure

Cooper Testing Labs, Inc.
937 Commercial Street
Palo Alto, CA 94303

Unconsolidated-Undrained Triaxial Test
ASTM D2850





Sample Data				
	1	2	3	4
Moisture %	53.5	50.7	49.6	
Dry Den,pcf	69.0	68.2	71.0	
Void Ratio	1.444	1.471	1.373	
Saturation %	100.0	93.1	97.6	
Height in	6.10	6.26	6.04	
Diameter in	2.87	2.88	2.84	
Cell psi	48.2	50.8	10.8	
Strain %	15.00	13.93	13.60	
Deviator, ksf	3.054	3.597	0.957	
Rate %/min	1.00	1.00	1.00	
in/min	0.061	0.063	0.060	
Job No.:	336-321			
Client:	Kleinfelder			
Project:	Sunset Project - 20182650.001A			
Boring:	B-1	B-5	B-6	
Sample:				
Depth ft:	140	170	30	

Visual Soil Description	
Sample #	
1	Greenish Gray Fat CLAY (Bay Mud)
2	Greenish Gray SILT w/ organics (Bay Mud)
3	Greenish Gray SILT (Bay Mud)
4	

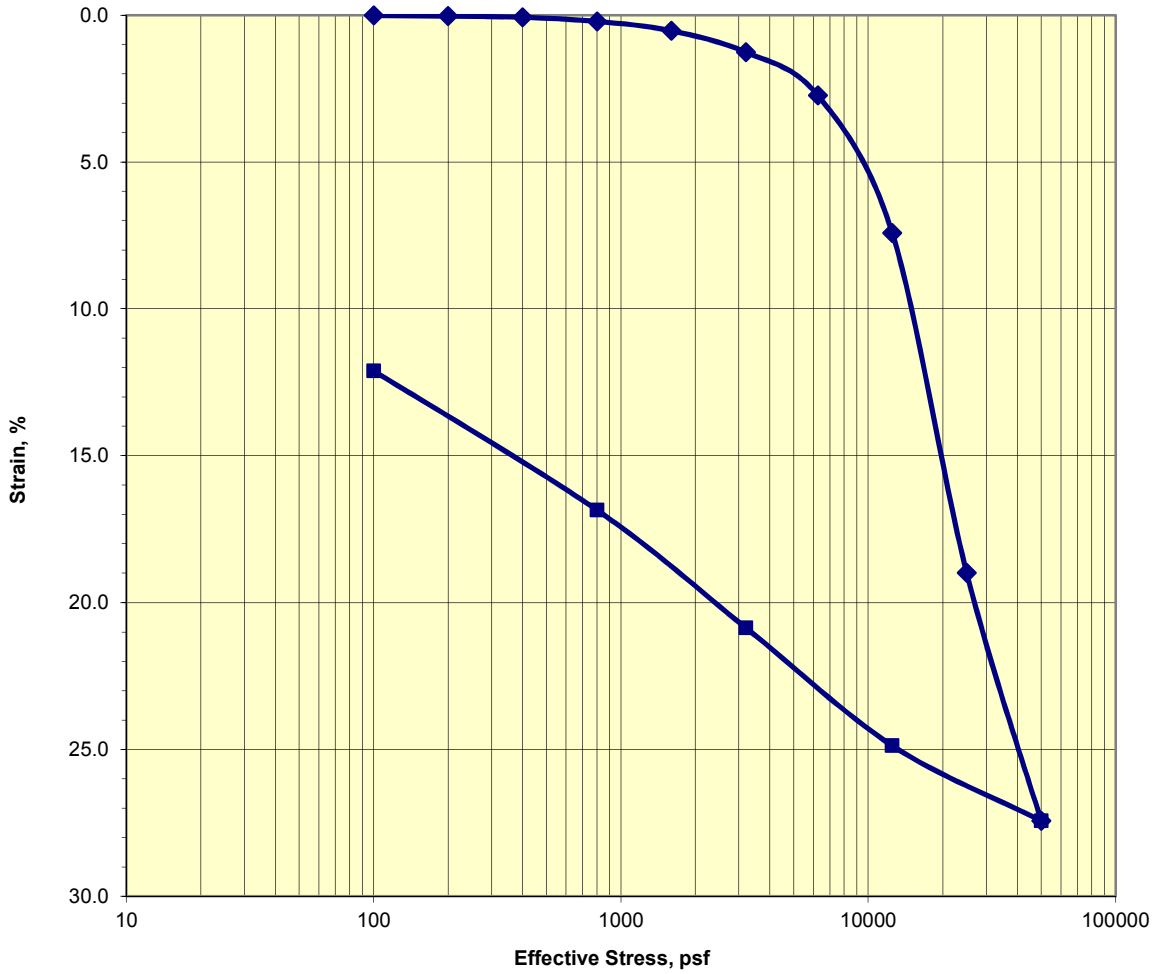
Remarks:

Note: Strengths are picked at the peak deviator stress or 15% strain which ever occurs first per ASTM D2850.

Consolidation Test
ASTM D2435

Job No.:	336-321	**Boring:**	B-1	**Run By:**	MD
Client:	Kleinfelder	**Sample:**		**Reduced:**	PJ
Project:	20182650.001A	**Depth, ft.:**	140(Tip-4")	**Checked:**	PJ/DC
Soil Type:	Greenish Gray Fat CLAY (Bay Mud)			**Date:**	1/17/2018

Strain-Log-P Curve

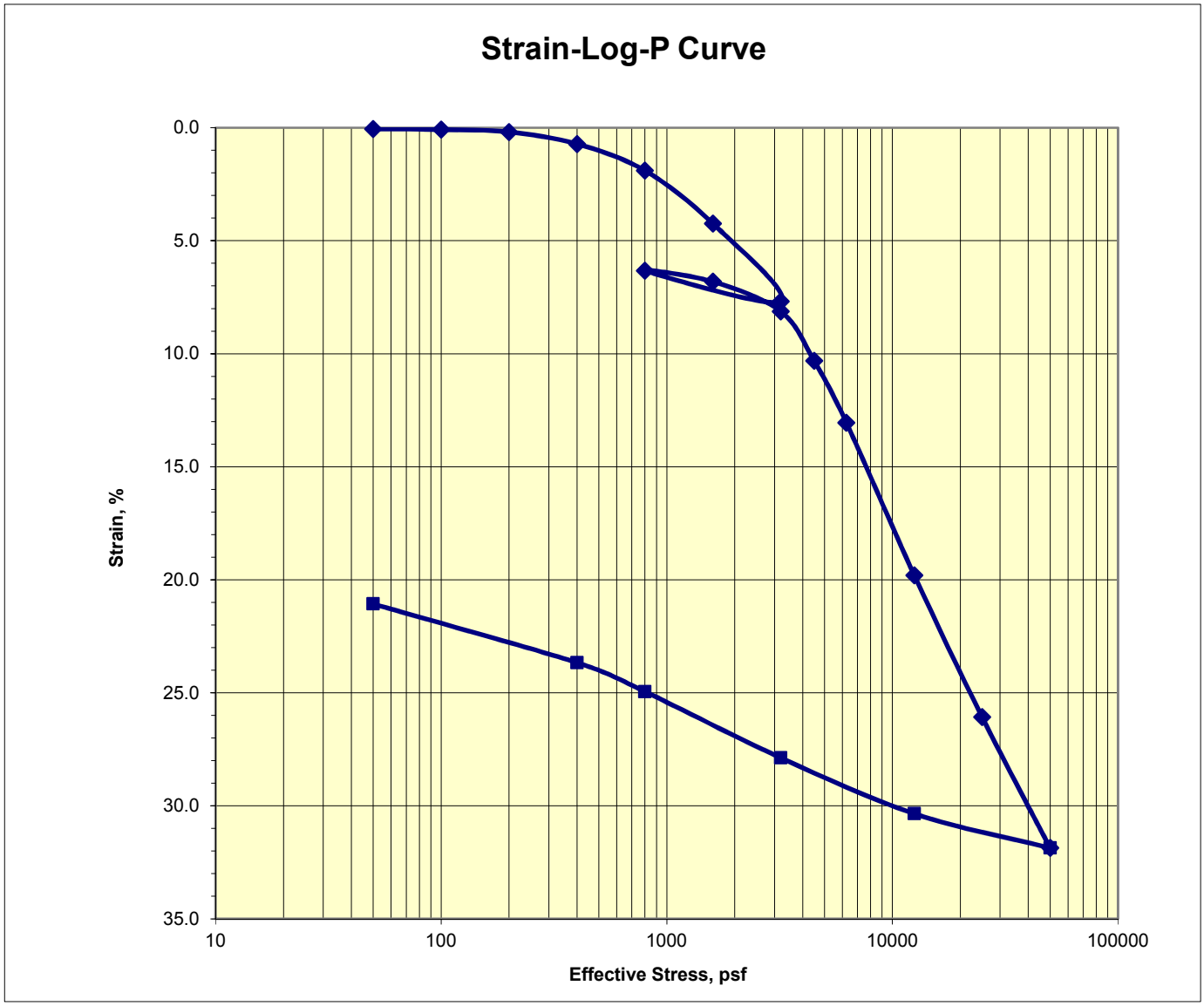


Assumed Gs 2.8	**Initial**	**Final**
Moisture %:	54.2	44.7
Dry Density, pcf:	68.2	77.7
Void Ratio:	1.561	1.250
% Saturation:	97.3	100.0

Remarks:

Consolidation Test
ASTM D2435

Job No.:	336-319	**Boring:**	B-4	**Run By:**	MD
Client:	Kleinfelder	**Sample:**		**Reduced:**	PJ
Project:	20182658.001A	**Depth, ft.:**	90(Tip-3")	**Checked:**	PJ/DC
Soil Type:	Greenish Gray Elastic SILT (Bay Mud)			**Date:**	12/20/2017



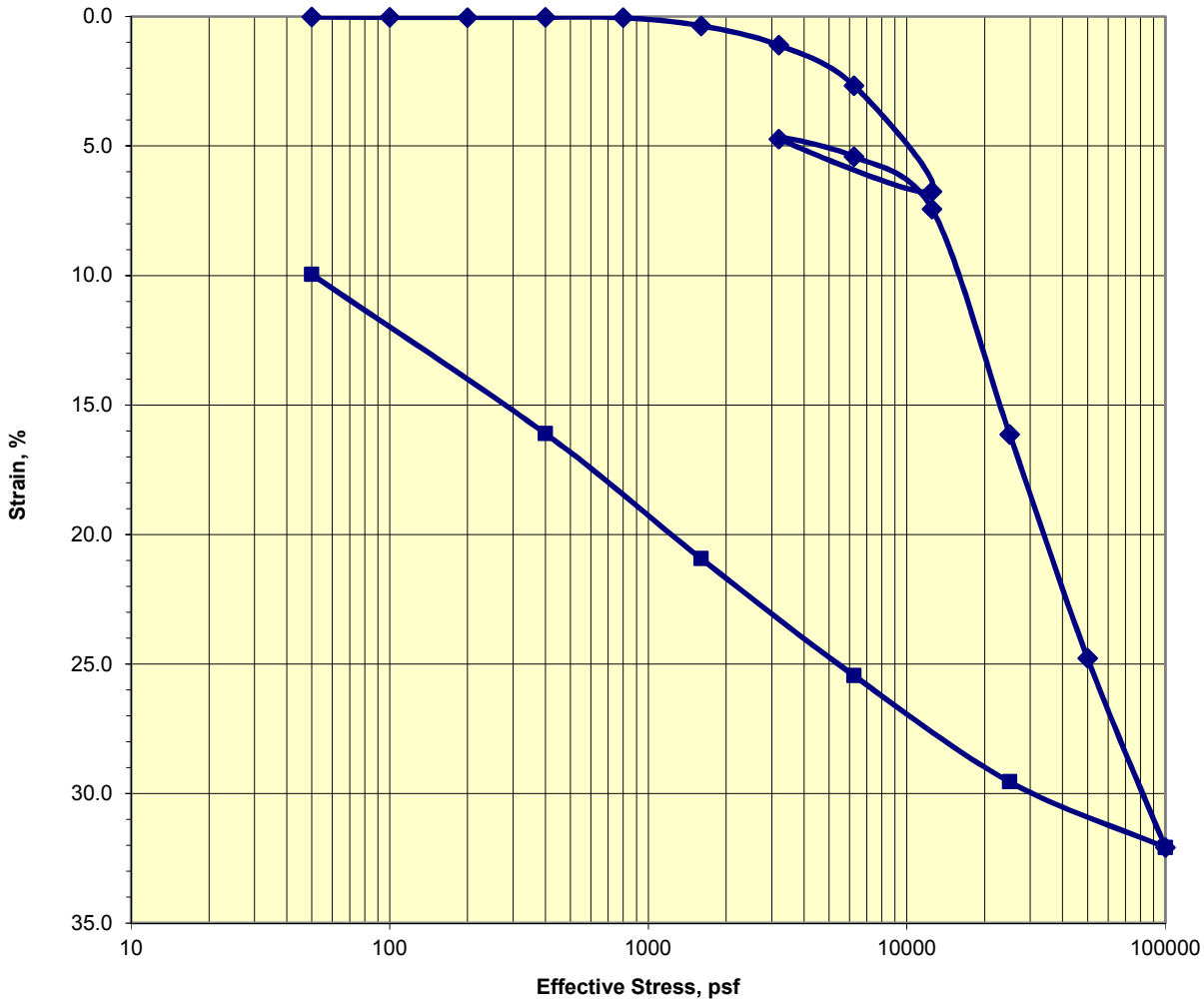
Assumed Gs 2.7	Initial	Final
Moisture %:	55.5	38.3
Dry Density, pcf:	65.6	82.8
Void Ratio:	1.571	1.035
% Saturation:	95.4	100.0

Remarks:

Consolidation Test
ASTM D2435

Job No.:	336-319	**Boring:**	B-4	**Run By:**	MD
Client:	Kleinfelder	**Sample:**		**Reduced:**	PJ
Project:	20182658.001A	**Depth, ft.:**	140(Tip-3")	**Checked:**	PJ/DC
Soil Type:	Greenish Gray Fat CLAY (Bay Mud)			**Date:**	12/21/2017

Strain-Log-P Curve



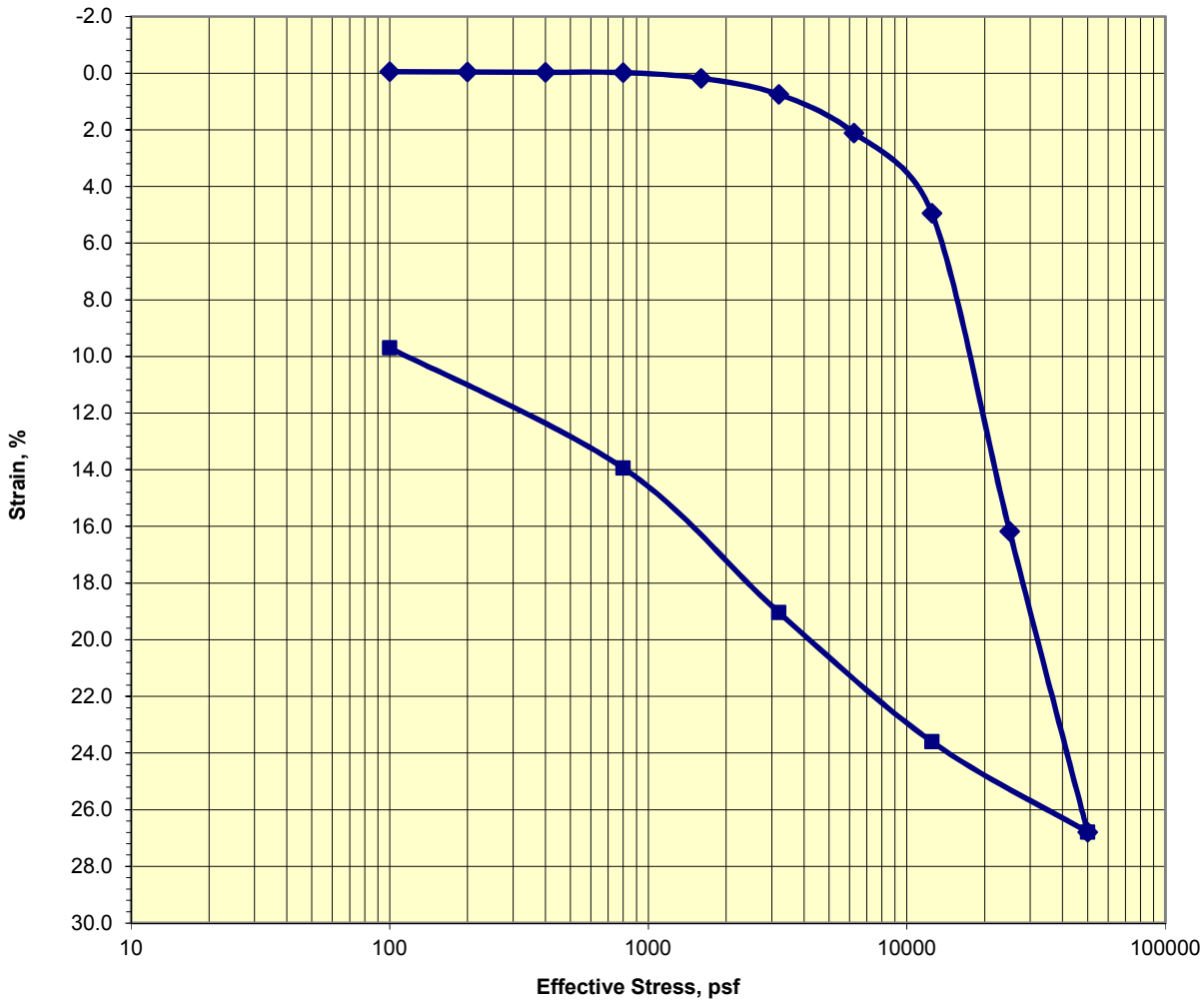
Assumed Gs 2.75	Initial	Final
Moisture %:	51.0	43.7
Dry Density, pcf:	71.0	78.0
Void Ratio:	1.419	1.202
% Saturation:	98.8	100.0

Remarks:

Consolidation Test
ASTM D2435

Job No.:	336-321	**Boring:**	B-5	**Run By:**	MD
Client:	Kleinfelder	**Sample:**		**Reduced:**	PJ
Project:	20182650.001A	**Depth, ft.:**	170(Tip-7")	**Checked:**	PJ/DC
Soil Type:	Greenish Gray SILT w/ organics (Bay Mud)			**Date:**	1/17/2018

Strain-Log-P Curve



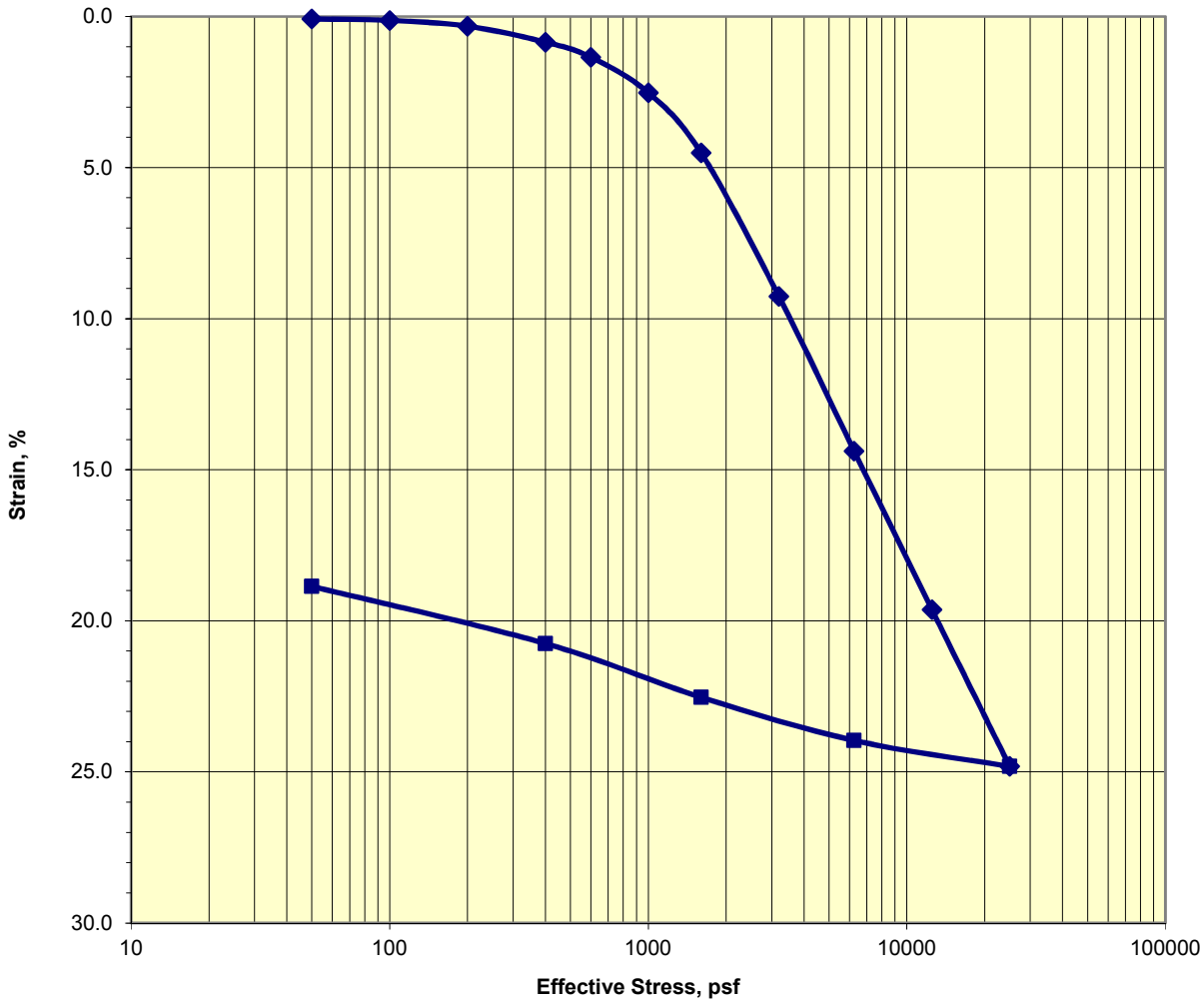
Assumed Gs 2.75	Initial	Final
Moisture %:	56.0	49.7
Dry Density, pcf:	65.8	72.5
Void Ratio:	1.607	1.366
% Saturation:	95.8	100.0

Remarks:

Consolidation Test
ASTM D2435

Job No.:	336-321	**Boring:**	B-6	**Run By:**	MD
Client:	Kleinfelder	**Sample:**		**Reduced:**	PJ
Project:	20182650.001A	**Depth, ft.:**	30(Tip-3")	**Checked:**	PJ/DC
Soil Type:	Greenish Gray SILT (Bay Mud)			**Date:**	1/18/2018

Strain-Log-P Curve



Assumed Gs 2.75	Initial	Final
Moisture %:	48.5	33.9
Dry Density, pcf:	72.6	88.8
Void Ratio:	1.366	0.932
% Saturation:	97.7	100.0

Remarks:

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Appendix D

GBA INFORMATION SHEET

Important Information about This

Geotechnical-Engineering Report

Subsurface problems are a principal cause of construction delays, cost overruns, claims, and disputes.

While you cannot eliminate all such risks, you can manage them. The following information is provided to help.

The Geoprofessional Business Association (GBA) has prepared this advisory to help you – assumedly a client representative – interpret and apply this geotechnical-engineering report as effectively as possible. In that way, you can benefit from a lowered exposure to problems associated with subsurface conditions at project sites and development of them that, for decades, have been a principal cause of construction delays, cost overruns, claims, and disputes. If you have questions or want more information about any of the issues discussed herein, contact your GBA-member geotechnical engineer. Active engagement in GBA exposes geotechnical engineers to a wide array of risk-confrontation techniques that can be of genuine benefit for everyone involved with a construction project.

Understand the Geotechnical-Engineering Services Provided for this Report

Geotechnical-engineering services typically include the planning, collection, interpretation, and analysis of exploratory data from widely spaced borings and/or test pits. Field data are combined with results from laboratory tests of soil and rock samples obtained from field exploration (if applicable), observations made during site reconnaissance, and historical information to form one or more models of the expected subsurface conditions beneath the site. Local geology and alterations of the site surface and subsurface by previous and proposed construction are also important considerations. Geotechnical engineers apply their engineering training, experience, and judgment to adapt the requirements of the prospective project to the subsurface model(s). Estimates are made of the subsurface conditions that will likely be exposed during construction as well as the expected performance of foundations and other structures being planned and/or affected by construction activities.

The culmination of these geotechnical-engineering services is typically a geotechnical-engineering report providing the data obtained, a discussion of the subsurface model(s), the engineering and geologic engineering assessments and analyses made, and the recommendations developed to satisfy the given requirements of the project. These reports may be titled investigations, explorations, studies, assessments, or evaluations. Regardless of the title used, the geotechnical-engineering report is an engineering interpretation of the subsurface conditions within the context of the project and does not represent a close examination, systematic inquiry, or thorough investigation of all site and subsurface conditions.

Geotechnical-Engineering Services are Performed for Specific Purposes, Persons, and Projects, and At Specific Times

Geotechnical engineers structure their services to meet the specific needs, goals, and risk management preferences of their clients. A geotechnical-engineering study conducted for a given civil engineer will not likely meet the needs of a civil-works constructor or even a different civil engineer. Because each geotechnical-engineering study is unique, each geotechnical-engineering report is unique, prepared *solely* for the client.

Likewise, geotechnical-engineering services are performed for a specific project and purpose. For example, it is unlikely that a geotechnical-engineering study for a refrigerated warehouse will be the same as one prepared for a parking garage; and a few borings drilled during a preliminary study to evaluate site feasibility will not be adequate to develop geotechnical design recommendations for the project.

Do not rely on this report if your geotechnical engineer prepared it:

- for a different client;
- for a different project or purpose;
- for a different site (that may or may not include all or a portion of the original site); or
- before important events occurred at the site or adjacent to it; e.g., man-made events like construction or environmental remediation, or natural events like floods, droughts, earthquakes, or groundwater fluctuations.

Note, too, the reliability of a geotechnical-engineering report can be affected by the passage of time, because of factors like changed subsurface conditions; new or modified codes, standards, or regulations; or new techniques or tools. *If you are the least bit uncertain* about the continued reliability of this report, contact your geotechnical engineer before applying the recommendations in it. A minor amount of additional testing or analysis after the passage of time – if any is required at all – could prevent major problems.

Read this Report in Full

Costly problems have occurred because those relying on a geotechnical-engineering report did not read the report in its entirety. Do not rely on an executive summary. Do not read selective elements only. *Read and refer to the report in full.*

You Need to Inform Your Geotechnical Engineer About Change

Your geotechnical engineer considered unique, project-specific factors when developing the scope of study behind this report and developing the confirmation-dependent recommendations the report conveys. Typical changes that could erode the reliability of this report include those that affect:

- the site's size or shape;
- the elevation, configuration, location, orientation, function or weight of the proposed structure and the desired performance criteria;
- the composition of the design team; or
- project ownership.

As a general rule, *always* inform your geotechnical engineer of project or site changes – even minor ones – and request an assessment of their impact. *The geotechnical engineer who prepared this report cannot accept*

responsibility or liability for problems that arise because the geotechnical engineer was not informed about developments the engineer otherwise would have considered.

Most of the "Findings" Related in This Report Are Professional Opinions

Before construction begins, geotechnical engineers explore a site's subsurface using various sampling and testing procedures. *Geotechnical engineers can observe actual subsurface conditions only at those specific locations where sampling and testing is performed.* The data derived from that sampling and testing were reviewed by your geotechnical engineer, who then applied professional judgement to form opinions about subsurface conditions throughout the site. Actual sitewide-subsurface conditions may differ – maybe significantly – from those indicated in this report. Confront that risk by retaining your geotechnical engineer to serve on the design team through project completion to obtain informed guidance quickly, whenever needed.

This Report's Recommendations Are Confirmation-Dependent

The recommendations included in this report – including any options or alternatives – are confirmation-dependent. In other words, they are not final, because the geotechnical engineer who developed them relied heavily on judgement and opinion to do so. Your geotechnical engineer can finalize the recommendations *only after observing actual subsurface conditions* exposed during construction. If through observation your geotechnical engineer confirms that the conditions assumed to exist actually do exist, the recommendations can be relied upon, assuming no other changes have occurred. *The geotechnical engineer who prepared this report cannot assume responsibility or liability for confirmation-dependent recommendations if you fail to retain that engineer to perform construction observation.*

This Report Could Be Misinterpreted

Other design professionals' misinterpretation of geotechnical-engineering reports has resulted in costly problems. Confront that risk by having your geotechnical engineer serve as a continuing member of the design team, to:

- confer with other design-team members;
- help develop specifications;
- review pertinent elements of other design professionals' plans and specifications; and
- be available whenever geotechnical-engineering guidance is needed.

You should also confront the risk of constructors misinterpreting this report. Do so by retaining your geotechnical engineer to participate in prebid and preconstruction conferences and to perform construction-phase observations.

Give Constructors a Complete Report and Guidance

Some owners and design professionals mistakenly believe they can shift unanticipated-subsurface-conditions liability to constructors by limiting the information they provide for bid preparation. To help prevent the costly, contentious problems this practice has caused, include the complete geotechnical-engineering report, along with any attachments or appendices, with your contract documents, *but be certain to note conspicuously that you've included the material for information purposes only.* To avoid misunderstanding, you may also want to note that "informational purposes" means constructors have no right to rely on the interpretations, opinions, conclusions, or recommendations in the report. Be certain that constructors know they may learn about specific project requirements, including options selected from the report, *only* from the design drawings and specifications. Remind constructors that they may perform their own studies if they want to, and *be sure to allow enough time* to permit them to do so. Only then might you be in a position to give constructors the information available to you, while requiring them to at least share some of the financial responsibilities stemming from unanticipated conditions. Conducting prebid and preconstruction conferences can also be valuable in this respect.

Read Responsibility Provisions Closely

Some client representatives, design professionals, and constructors do not realize that geotechnical engineering is far less exact than other engineering disciplines. This happens in part because soil and rock on project sites are typically heterogeneous and not manufactured materials with well-defined engineering properties like steel and concrete. That lack of understanding has nurtured unrealistic expectations that have resulted in disappointments, delays, cost overruns, claims, and disputes. To confront that risk, geotechnical engineers commonly include explanatory provisions in their reports. Sometimes labeled "limitations," many of these provisions indicate where geotechnical engineers' responsibilities begin and end, to help others recognize their own responsibilities and risks. *Read these provisions closely.* Ask questions. Your geotechnical engineer should respond fully and frankly.

Geoenvironmental Concerns Are Not Covered

The personnel, equipment, and techniques used to perform an environmental study – e.g., a "phase-one" or "phase-two" environmental site assessment – differ significantly from those used to perform a geotechnical-engineering study. For that reason, a geotechnical-engineering report does not usually provide environmental findings, conclusions, or recommendations; e.g., about the likelihood of encountering underground storage tanks or regulated contaminants. *Unanticipated subsurface environmental problems have led to project failures.* If you have not obtained your own environmental information about the project site, ask your geotechnical consultant for a recommendation on how to find environmental risk-management guidance.

Obtain Professional Assistance to Deal with Moisture Infiltration and Mold

While your geotechnical engineer may have addressed groundwater, water infiltration, or similar issues in this report, the engineer's services were not designed, conducted, or intended to prevent migration of moisture – including water vapor – from the soil through building slabs and walls and into the building interior, where it can cause mold growth and material-performance deficiencies. Accordingly, ***proper implementation of the geotechnical engineer's recommendations will not of itself be sufficient to prevent moisture infiltration. Confront the risk of moisture infiltration*** by including building-envelope or mold specialists on the design team. ***Geotechnical engineers are not building-envelope or mold specialists.***

GEOPROFESSIONAL BUSINESS ASSOCIATION

Telephone: 301/565-2733
e-mail: info@geoprofessional.org www.geoprofessional.org

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APPENDIX G
AIR QUALITY SUPPORTING INFORMATION

CEQA AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

Pier 92 Modernization and Plant Replacement Project San Francisco, CA

Project Sponsor: Martin Marietta Northern California Aggregates, LLC

Prepared For:

San Francisco Planning Department
49 South Van Ness Avenue, Suite 1400
San Francisco, CA 94103

Prepared By:

TRINITY CONSULTANTS
1939 Harrison Street, Suite 618
Oakland, CA 94612
(510) 285-6351

January 2026

Trinity Consultants

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1. INTRODUCTION

As required by the San Francisco Planning Department's Environmental Planning (EP) division, Trinity Consultants, Inc. (Trinity) will conduct a California Environmental Quality Act (CEQA) air quality analysis of the criteria air pollutant emissions and health risks associated with the construction and operational phases of Martin Marietta Northern California Aggregates, LLC's (Martin Marietta's) Pier 92 Modernization and Plant Replacement Project (the Project or Proposed Project). This Air Quality (AQ) and Health Risk Assessment (HRA) Methodology Memorandum documents the scope and methods used to perform these analyses. The methodology describes how calculations of the Project criteria air pollutant emissions and toxic air contaminant (TAC) emissions will be performed, and how modeling of resultant health risks from Project construction and operation will occur. The results of the analysis will be used to support EP's CEQA Environmental Impact Report (EIR) and documentation for the Project.

1.1 Existing Facility Operations

Martin Marietta currently operates a sand processing facility at Pier 92 in San Francisco, California (Pier 92 or the Facility) within the jurisdiction of the Bay Area Air District (Air District).

The Facility is leased from the Port of San Francisco and occupies an area of approximately 190,229 square feet (4.37 acres). The majority of the Facility is unpaved, except for a small area leading to the truck scale. The essential operations of the Facility are as follows:

- **Step 1: Marine sand is offloaded and stockpiled.**
  - The Facility receives marine sand via barge from Islais Creek Channel along the northern boundary of the Facility. The sand is transferred from barges to an uncovered raw material stockpile via an unloading conveyor. The sand is saturated with water upon arrival and throughout the unloading process. The unloading conveyor transports the sand southward, where a radial stacker distributes the sand onto the raw material stockpile. The raw material stockpile is maintained in wet condition using a sprinkler system.
- **Step 2: Sand from the raw material stockpile is transferred to the wash plant.**
  - Sand from the raw material stockpile is loaded via front-end loader and transferred to the feed hopper at the wash plant. The loader path is unpaved. The wash plant is located near the southeast corner of the Raw Material Stockpile.
- **Step 3: Sand is screened and washed at the wash plant.**
  - The sand drops from the feed hopper onto a conveyor belt. The conveyor belt transfers the sand into the processing screen. A water spray system is used to control two drop point emissions (hopper to conveyor and conveyor to screen). As the sand moves through screens, water is added to the sand which becomes fully saturated. The screens remove pea gravel, shells, and any oversized sand. The screened oversized material is transferred via a conveyor belt and distributed using a stacker to the uncovered oversized stockpile. The remaining sand is processed further in the wash plant via a twin auger screw and a dewatering screen. The sand exits the dewatering screen at approximately 10% moisture content.
- **Step 4: Product sand is transferred to the product stockpile.**
  - The product sand is transferred to the uncovered product stockpile via conveyor and radial stacker. At this point, the sand is still fully saturated with water. The product pile is periodically wetted via water spray.
- **Step 5: Product sand is transferred to customer trucks.**
  - Customer trucks enter the Facility from Amador Street, through the northern entrance. Martin Marietta does not own nor operate any haul trucks. The customer trucks move throughout the

Facility on an unpaved pathway to be loaded. Sand is transferred from the product sand stockpile to the customer trucks via front-end loader. Afterward, the customer trucks continue on the unpaved path before driving onto a short, paved path before their tires are cleaned via a wheel wash system and track-out control mat. Afterward, the trucks are weighed at the truck scale before leaving the Facility via the southern exit to Amador Street.

The sand is used to build public and private projects and infrastructure throughout San Francisco and the greater San Francisco Bay Area. Under typical conditions, Martin Marietta estimates that about 65% to 75% of the sand produced at the Facility is transported to the two adjacent ready-mix concrete facilities (Central Concrete Supply and CEMEX San Francisco Pier 92).[1] Additionally, EP has determined, for the purpose of environmental review, that the Baseline annual throughput is 349,078 tons/year of sand, which represents an average of the facility's most recent five-year annual throughput from the 2020-2024 operating period.

1.2 Proposed Project Description

The Project will involve continued operation of the Facility under the same plant classification and uses while implementing additional control measures to reduce air emissions. To comply with Air District permitting requirements, the Project will also obtain a Permit to Operate (PTO) from the Air District authorizing a throughput maximum of up to 800,000 tons/year of sand. Additional changes to the Facility resulting from the Project are discussed below.

1.2.1 Changes to Lease Parcel

The Project will include a physical expansion of the site by approximately 34,371 square feet (0.79 acres), increasing the total site size to 224,600 square feet (5.16 acres).

1.2.2 Facility Improvements

The Project will include a construction phase (up to 7 months) for the additional control measures and reconfiguration of equipment, and an operational phase.

The proposed improvements include roadway paving of customer truck and loader pathways, construction of a warehouse enclosure for the product sand pile, and the addition of improved controls, including an upgraded wheel wash, truck bed water spray, and a modern stormwater management system. Facility improvements which affect air emissions are described below.

- **Step 1: Marine sand is offloaded and stockpiled.**
  - No substantial changes affecting emissions are proposed as the sand would continue to be saturated with water during offloading and the raw material pile will continue to be wetted by water spray.
- **Step 2: Sand from the raw material stockpile is transferred to the wash plant.**
  - Sand will continue to be transferred from the raw material stockpile to the feed hopper at the wash plant via front-end loader. The front-end loader travel pathway will be paved, resulting in less emissions.
- **Step 3: Sand is screened and washed at the wash plant.**
  - Upgrades to equipment and its control measures are planned for this step: all conveyors at the wash plant and the initial screen will be replaced or retrofitted with covers. The processing screen will be replaced with a fully enclosed screen. The oversized stockpile will move slightly northward from the

[1] Estimates of sand product transported to the two adjacent concrete-ready-mix plants per Martin Marietta, based on historical sales.

existing location. Since the sand is saturated with water while being processed at the wash plant, no substantial changes to the emissions will result.

- **Step 4: Product sand is transferred to the product stockpile.**
  - The sand will be transported to the product stockpile via a covered conveyor. The sand will still be fully saturated with water at this point. The product stockpile will now be located in a new partially enclosed warehouse blocking winds from the west and east. The warehouse will be approximately 140' in width, 220' in length and 63' in height. The warehouse will reduce wind erosion emissions from the product stockpile.
- **Step 5: Product sand is transferred to customer trucks.**
  - Customer trucks will continue to enter the site from the same location on Amador Street. The customer truck path will now be entirely paved. Truck loading will occur within the new warehouse. New wheel wash and truck bed water spray systems will be installed and used once the trucks exit the new warehouse for further abatement. Customer trucks will exit to Amador Street, slightly south of the existing exit gate after the truck scale.

To implement the improvements, the following construction activity will occur:

- Disassembly of existing equipment followed by removal of concrete footings for such equipment.
- Excavation will occur as needed to install the improvements and new equipment (including electrical trenches, concrete foundations, and the stormwater system), disturbing approximately 3,305 cubic yards of soil.
- Any excavated soil will be hauled off-site.
- Grading of 1.50 acres of area will occur.
- Paving will occur, affecting approximately 60,000 square feet of area. Areas that will be paved include loader and customer truck pathways. Additionally, 3,330 square feet of area will be paved for employee/visitor parking.

1.3 Objectives and Methodology

Trinity will evaluate the potential air quality and health risk impacts associated with the construction and operation of the Project. The analysis will be conducted in accordance with the standards, guidelines, procedures, and methodologies established in EP's Air Quality Guidelines and Greenhouse Gas Analysis Guidelines (SF Planning Department, 2025), the Air District's CEQA Guidelines (Air District, 2022), and the California Natural Resources Agency's CEQA Guidelines (California Natural Resources Agency, 2019). Additionally, the evaluation will utilize guidance and methodologies from the California Air Resources Board (CARB), the California Office of Environmental Health Hazard Assessment (OEHHA), and the United States Environmental Protection Agency (EPA).

Criteria pollutant and TAC emissions will be evaluated for the construction phase and operational phase (i.e., Project emissions). Additionally, Trinity will evaluate emissions during the Baseline Period (i.e., Baseline emissions) using the operational average during this period.[2] The calculated Project emissions and Baseline emissions will be used to determine the net project increase. Results will be tabulated as demonstrated in **Table 1-1 through Table 1-4**, which are shown as blank here, but will be populated in the separate results memorandum.

[2] The Baseline Period, and resultant average throughputs and trips, will be the based on the most recent 5-year timeframe per EP.

Table 1-1. Operation: Criteria Pollutant Potential to Emit (PTE) Summary

Scenario	Sources	PM_{10}	$PM_{2.5}$	NO_x	ROG
Baseline	Material Transfer			NA	NA
	Stockpiles			NA	NA
	Fugitive Road Dust			NA	NA
	Barge Trips				
	Off-Road Equipment				
	On-Road Vehicles				
	Total Baseline Emissions				
Project	Material Transfer			NA	NA
	Stockpiles			NA	NA
	Fugitive Road Dust			NA	NA
	Barge Trips				
	Off-Road Equipment				
	On-Road Vehicles				
	Total Project Emissions				
Change in Emissions	Material Transfer			NA	NA
	Stockpiles			NA	NA
	Fugitive Road Dust			NA	NA
	Barge Trips				
	Off-Road Equipment				
	On-Road Vehicles				
Total Change in Emissions					

Table 1-2. Operation: TAC PTE Summary

Scenario	Sources	Respirable Crystalline Silica	Diesel Particulate Matter	Heavy Metal 1	Heavy Metal 2	…
Baseline	Material Transfer		NA	NA	NA	NA
	Stockpiles		NA	NA	NA	NA
	Fugitive Road Dust		NA			
	Barge Trips	NA		NA	NA	NA
	Off-Road Equipment	NA		NA	NA	NA
	On-Road Vehicle	NA		NA	NA	NA
	Total Baseline Emissions					
Project	Material Transfer		NA	NA	NA	NA
	Stockpiles		NA	NA	NA	NA
	Fugitive Road Dust		NA			
	Barge Trips	NA		NA	NA	NA
	Off-Road Equipment	NA		NA	NA	NA
	On-Road Vehicle	NA		NA	NA	NA
	Total Project Emissions					
Change in Emissions	Material Transfer		NA	NA	NA	NA
	Stockpiles		NA	NA	NA	NA
	Fugitive Road Dust		NA			
	Barge Trips	NA		NA	NA	NA
	Off-Road Equipment	NA		NA	NA	NA
	On-Road Vehicle	NA		NA	NA	NA
Total Change in Emissions						

Table 1-3. Construction: Criteria Pollutant PTE Summary

Sources	PM_{10}	$PM_{2.5}$	NO_x	ROG
Off-Road Equipment				
On-Road Vehicles				
Paving	NA	NA	NA	
Excavation			NA	NA
Grading			NA	NA
Fugitive Road Dust			NA	NA
Total Construction Emissions				

Table 1-4. Construction: TAC PTE Summary

Sources	Diesel Particulate Matter
Off-Road Equipment	
On-Road Vehicles	
Paving	NA
Excavation	NA
Grading	NA
Total Construction Emissions	

Trinity anticipates that sources of emissions from the Project will include:

- Construction equipment such as cranes, lifts, forklifts, pavers, water trucks, and heavy-duty trucks (construction phase);
- Material transfer points (operational phase);
- Stockpiles (operational phase);
- Fugitive road dust (operational phase);[3]
- Barges and tugboats (operational phase); and
- Mobile sources such as passenger vehicles, loaders, and customer trucks (construction and operational phase).

A detailed description of the methodology to be used in calculating emissions from such sources is described in **Section 2**.

The HRA will be used to evaluate potential incremental health risk impacts (i.e., cancer risk, chronic hazard index, operational acute hazard index,[4] and annual average $PM_{2.5}$ concentration impact). The Project's health risk impacts are determined from potential exposure to TACs and $PM_{2.5}$ associated with the Project's short-term construction and long-term operational phases. Anticipated TACs include crystalline silica and diesel particulate matter (DPM), heavy metals, and certain volatile organic compounds entrained in the road dust. The HRA results will be determined in accordance with EP's Air Quality Guidelines, with additional supporting information based on Air District CEQA Guidelines Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards (Appendix E).

A detailed description of the methodology to be used in air dispersion modeling and the HRA from the Project is described in **Section 3** and **Section 4**.

The results of the analysis will be documented in a summary *"Air Quality and HRA Results Memorandum"* that will be presented to EP and ICF and subsequently used to prepare the EIR air quality analysis section.

[3] Fugitive dust from on-site construction will not be quantified per EP's Air Quality and Greenhouse Gas Analysis Guidelines. Fugitive dust from off-site roadway travel will also not be quantified as explained below.

[4] The Project's construction phase is not anticipated to include TACs with acute health impacts.

2. PROJECT EMISSIONS METHODOLOGY

Project emissions will be quantified for the construction and the operational phases of the Project. **Sections 2.1 and 2.2** describe the methodology to be used for evaluating the criteria air pollutants and TACs.

Trinity will calculate emissions consistent with methodologies, emission factors, and other default data in the most recent version of CalEEMod (i.e., Version 2022.1) but currently does not plan to utilize the CalEEMod software itself. The specific emission factors and their primary sources are presented in the following sections.

The emission factors and calculation methods that will be used to quantify emissions will be based on the following sections. Any deviations will be noted in the *Air Quality and HRA Results Memorandum*. Where available, local (Air District and California) and recently developed emission factors will be selected. In the absence of local emission factors, the most appropriate non-California or federal emission factor will be applied.

2.1 Construction Emissions Methodology

The construction phase of the Project will include reconfiguring the conveyors, excavation, grading, road pavement, and construction of the product pile enclosure. Emissions will result from excavation, grading, road pavement and the operation of off-road construction equipment, on-road worker vehicles, on-road equipment delivery vehicles, and on-road haul trucks for soil removal involved in the construction process. Additionally, road dust emissions will result from vehicle travel to and from the Facility. Construction equipment quantity and operating schedule will be based on project-specific data provided by Martin Marietta/EP and will be included in the *AQ and HRA Results Memorandum*. It is conservatively assumed that the facility will continue to operate at existing baseline levels during the construction period.

2.1.1 Calculation Methodology

Table 2-1, Table 2-2, and **Table 2-3** describe the emission calculation methodology associated with paving, excavation, and grading activity during the construction phase. **Table 2-4, Table 2-5**, and **Table 2-6** describe the emission calculation methodology for the construction phase emissions from off-road equipment and on-road vehicles.

Table 2-1. Emission Calculation Methodology – Asphalt Paving (Construction)

Parameter	Basis
Activity Summary	Asphalt paving of the Facility. Emissions result from off-gassing.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/acre) x Paved Area (acre) x Percentage Area Paved with Asphalt (%)
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated as the product of emission factors and paved area per the Project Description. The % area paved with asphalt is assumed to be 100%. **TAC:** It is assumed that negligible amounts of TACs are emitted from paving off-gassing.
Emission Factor	Criteria pollutant ***emission factors*** will be per CalEEMod 2022.1 Appendix C, Section 4.9. See **Table A-1 in Appendix A** for more details.
Paved Area	63,330 square feet or 1.45 acres.
% Area Paved with Asphalt	Assume 100% paving is with asphalt.

Table 2-2. Emission Calculation Methodology – Excavation Activity (Construction)

Parameter	Basis
Activity Summary	Excavation will be performed for the new warehouse and equipment foundations, electrical trenching, and for the installation of the enhanced drainage system. Emissions result from fugitive dust generated during the ground disturbances.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/hr) x Duration of Excavation (hr/yr) / 2,000 (lb/ton).
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated as the product of the emission factor and the duration of excavation. **TAC**: It is assumed that negligible amounts of TACs are emitted from excavation.
Emission Factor	Criteria pollutant ***emission factors*** will be calculated per CalEEMod 2022.1 User Guide Appendix C, Section 4.4.2 for bulldozing activities. See **Table A-2 in Appendix A** for more details.
Duration of Excavation	80 hours/year.
Control Efficiency	None applied.

Table 2-3. Emission Calculation Methodology – Grading Activity (Construction)

Parameter	Basis
Activity Summary	Grading of approximately 1.5 acres of area. Grading will be conducted for the portions of the site where the new warehouse will be built, new equipment would be installed, electrical trenching would occur, areas will be paved, and installation of the enhanced drainage system will occur.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/VMT) x VMT (miles/year) / 2,000 (lb/ton).
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated as the product of the emission factor, and calculated VMT. **TAC**: It is assumed that negligible amounts of TACs are emitted from grading.
Emission Factor	Criteria pollutant ***emission factors*** will be calculated per CalEEMod 2022.1 User Guide Appendix C, Section 4.4.1. See **Table A-3 in Appendix A** for more details.
VMT	VMT will be calculated per CalEEMod 2022.1 User Guide Appendix C, Section 4.4.1 based on grading area and the default grader blade width. See **Table A-3 in Appendix A** for more detail.
Control Efficiency	None applied.

Table 2-4. Emission Calculation Methodology – Off-Road Equipment Emissions (Construction)

Parameter	Basis
Activity Summary	Construction equipment (forklift, man lift, crane, paver, etc., as specified) utilized onsite to assist with construction.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (g/bhp-hr) x Equipment Horsepower (HP) x Load Factor x 0.00220462 (lb/g) x Annual Operating Hours (hr/year) / 2000 (lb/ton).
Basis of Calculation	**Criteria Air Pollutants:** Emissions will be calculated as the product of the emission factor, the operating hours, and the applicable equipment horsepower and load factor. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.
Emission Factor	Criteria pollutant ***emission factors*** will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-11 for Year 2027. See **Table A-4 in Appendix A** for more details.
Equipment Horsepower	***Equipment horsepower ratings*** will be based on project-specific data, if available. Otherwise, default horsepower ratings of off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-4 in Appendix A** for more details.
Load Factor	***Load factors*** will be based on project-specific data, if available. Otherwise, default load factors of off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-4 in Appendix A** for more details.
Annual Operating Hours	***Annual Operating Hours*** will be calculated as the product of the number of each equipment type and hours of operation per equipment type based on the construction schedule provided by Martin Marietta. See **Table A-4 in Appendix A** for more details.
Control Efficiency	None applied.

Table 2-5. Emission Calculation Methodology – On-Road Vehicle Exhaust Emissions (Construction)

Parameter	Basis
Activity Summary	Construction worker vehicle, equipment delivery vehicle, asphalt delivery vehicle, base underlay delivery vehicle, and soil haul truck vehicle travel to and from the Facility.
Calculation Formula	**Running Annual Emissions (tpy)** = Running Emission Factor (g/mi) x Annual VMT (mi/yr). Converted to units of tons. **Start-Up Annual Emissions (tpy)** = Start-Up Emission Factor (g/trip) x Total Trips per Year (trips/year). Converted to units of tons.
Basis of Calculation	**Criteria Air Pollutant:** Running emissions will be calculated as the product of the emission factor and the VMT. Start-up emissions will be calculated as the product of emission factor and the number of trips. Start-up emissions are included as construction worker vehicles, equipment delivery vehicles, and soil haul trucks are expected to cease operation and re-start once during the construction workday. It is assumed that all construction worker vehicles, equipment delivery vehicles, asphalt delivery vehicles, base underlay vehicles, and haul trucks are diesel-fueled; as such, no evaporative emissions are included in the analysis. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.
Emission Factor	Criteria pollutant ***emission factors*** will be obtained from EMFAC2025 v2.0.0 for Calendar Year 2027, Bay Area Air District Region. Heavy-duty trucks (representing equipment delivery vehicles, asphalt delivery vehicles, and base underlay vehicles) will be represented as Vehicle Category T7 Single Other Class 8. Construction worker trucks will be represented as Vehicle Category LDT2. Soil haul trucks will be represented as Vehicle Category T7 Single Dump Class 8. *CARB's Off-Model EMFAC Adjustment Factors to Remove the Impact of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus and Warranty Phase I Regulations (October 2025)* will be applied to the emission factors as applicable. ***Start-up emission factors*** will be obtained for emissions associated with engine start-up (STREX). ***Running emission factors*** will be obtained for emissions associated with engine exhaust (RUNEX), tire wear (PMTW), and brake wear (PMBW). See **Table A-5 in Appendix A** for more details.
VMT	***Vehicle miles traveled (VMT)*** for asphalt delivery vehicles, and base underlay vehicles will be calculated using the project-specific trip length and number of vehicle trips.

Parameter	Basis
	VMT for equipment delivery trucks, construction worker trucks, and the soil haul trucks will be calculated using the default miles per trip from CalEEMod 2022.1 User Guide Appendix G, Table G-15 using Analysis Level: Air District as the selection criteria for nonresidential, other-other trips and number of trips. The number of equipment delivery trucks will be calculated assuming that one truck is required for each construction equipment unit (crane, paver, etc.). The number of asphalt delivery trucks will be calculated based on the paved area (63,330 square feet), assuming that 0.039 tons of asphalt are required per square foot, and that each haul truck has a capacity of 20 tons. The number of base underlay delivery trucks will be calculated based on the paved area (63,330 square feet), assuming that 0.0645 tons of base underlay are required per square foot, and that each haul truck has a capacity of 20 tons. The number of soil haul truck trips will be calculated using the amount of soil excavated during construction (3,305 cubic yards) and the default soil haul truck capacity (16 cubic yards) per CalEEMod v2022.1 User Guide Section 4.6.1. The number of worker trucks is assumed to be 10 trips per day over the construction duration (140 days). See **Table A-6 in Appendix A** for more details.
Control Efficiency	None applied.

Table 2-6. Emission Calculation Methodology – Fugitive Road Dust (Construction)

Parameter	Basis
Activity Summary	Fugitive road dust emissions from construction worker vehicles, equipment delivery vehicles, asphalt delivery vehicles, base underlay delivery vehicles, and soil haul truck travel to/from the Facility on paved public roads.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/VMT) x Annual VMT (miles/yr) / 2,000 (lb/ton).
Basis of Calculation	Construction worker vehicles, equipment delivery vehicles, asphalt delivery vehicles, base underlay delivery vehicles, and soil haul truck criteria pollutant emissions will be calculated using the ***paved road emission factors*** and the ***annual VMT on paved roads***.
Emission Factor	**Criteria Pollutants**: The PM_{10} and $PM_{2.5}$ emission factors for travel on paved roads will be calculated per AP-42 Chapter 13.2.1 Equation 2. See **Table A-7 of Appendix A** for more details. **TACs**: Due to the paved nature of public roads, TAC emissions from off-site travel on public roads are assumed to be negligible.
VMT	***VMT*** will be the values determined by **Table 2-5** See **Table A-6 in Appendix A** for more details.
Control Efficiency	None applied.

2.2 Operation Emissions Methodology

This section describes the methodology to be used for calculating emissions associated with the Baseline and Project operational scenarios. An overview of each scenario is provided below and calculation details for each emission source group under both scenarios are provided in **Table 2-7 through Table 2-12**.

2.2.1 Project Baseline Overview

Since Pier 92 is an existing operation that generates criteria pollutant emissions, this air quality evaluation will consider the net change in emissions from the Project in accordance with CEQA guidelines. The Baseline conditions at the Facility involve the following operations:

- Material transfer points
  - Particulate matter (PM) emissions result from three drop points; one from the loader to the hopper, one from the hopper to the conveyor, and one from the conveyor to initial screen. Note that no emissions are expected from material transfer between the barge to raw material stockpile as the sand is saturated with water during offloading. No emissions are expected from material transfers between the initial wash plant screen and product/oversize stockpiles, as the material is saturated with water during washing.
- Storage piles
  - Storage piles are grouped into one emission source consisting of raw material, oversized material, and product sand. PM emissions result from wind erosion.
- Fugitive road dust emissions

- PM emissions resulting from the workers' vehicle travel to/from the Facility are assumed to be negligible.[5]

- Barge and Tug operations
  - Exhaust emissions result from barge engines (main, generator, and bow thruster) and tugboat engines (main and generator) exhaust during travel and hoteling.
- Off-road equipment
  - Emissions result from engine exhaust.
  - Fugitive dust PM emissions result from the travel of front-end loader on paved and unpaved roads in the Facility.
- On-road vehicles
  - Emissions result from engine exhaust, tire wear, and brake wear.
  - Fugitive dust PM emissions result from the travel of customer trucks on paved and unpaved roads in the Facility.
  - Fugitive dust PM emissions result from the travel of customer trucks on paved public roads outside the Facility to the adjacent concrete plants, and other off-site deliveries.
  - Fugitive dust PM and exhaust emissions resulting from the workers' vehicle exhaust are assumed to be negligible.[6]

Trinity will utilize information from Martin Marietta and EP (e.g., throughput, trips, etc.) to calculate Baseline emissions. Average daily and annual emissions will be calculated for the Baseline per existing operation, controls, and actual material throughput as described in **Table 2-7 through Table 2-12.**

2.2.2 Project Overview

The Project will involve the continued operation of the existing emission sources described above (**Section 2.2.1**) with additional improvements, outlined below. The Facility will continue operations in the same manner as before the Project. Trinity will use the operational limits proposed in the March 2024 Authority to Construct permit application (the ATC Application) submitted by Martin Marietta to calculate emissions for the Project. These operational limits include:

- 250 barge deliveries during any consecutive 12-month period;
- 800,000 tons of sand during any consecutive 12-month period;
- 40,000 truck trips during any consecutive 12-month period; and
- 72,728 front loader trips during any consecutive 12-month period.

The Facility boundary will increase by approximately 34,371 square feet as part of the Project. The change in boundary is not expected to contribute substantially to the emissions analysis to be conducted in accordance with this methodology memorandum. All operations are assumed to continue to occur within the updated boundary.

The Project proposes changes to the Facility to include additional improvements to reduce criteria pollutant emissions such as:

- Road Pavement

[5] Per EP's Air Quality Guidelines (Appendix C), roads with less than 21,500 annual average daily traffic (AADT) per day typically pose a cancer risk of less than 10 in a million for people nearby. In comparison, 100 worker vehicles add only about 0.05 in a million, which is much smaller than the threshold. As such, PM emissions resulting from workers' vehicle travel are excluded.

[6] Ibid.

- The Project will involve paving the main haul path used by customer trucks and the majority of the front-end loader travel route, which is expected to decrease emissions from road dust. Additionally, the employee/visitor parking area will also be paved.
- Emissions associated with paving are described in **Table 2-1**.

► Redesign of the Facility Layout
- The Project includes repositioning of the stockpiles and the conveyors to better serve the processing plant. The new layout is expected to reduce the distance traveled by the loaders and the distance traveled by customer trucks, which is expected to reduce road dust emissions.

► Use of enhanced controls
- The Project includes replacement or upgrades to the conveyors and processing screen at the wash plant to enclose them. The existing conveyors associated with offloading (220' and 125' conveyors) will remain uncovered.
- The Project involves constructing a warehouse for the product stockpile that blocks prevailing winds. This is expected to reduce wind erosion emissions from the stockpile and truck loading emissions.
- A new truck wheel wash system will replace the existing one, and a new truck bed spray system will also be installed at the Facility exit to minimize track out and emissions from the customer trucks immediately departing the Facility.

Table 2-7 through Table 2-12 explain the proposed methodology used to calculate emissions from the Facility for the Baseline Period and Project scenarios.

2.2.3 Calculation Methodology

The calculation methods to be used for estimating emissions in the operational phase are explained in detail in the following tables.

Table 2-7. Emission Calculation Methodology – Material Transfer Points

Parameter	Baseline Scenario	Project Scenario
Activity Summary	There are three transfer points located at the Facility's wash plant which generate emissions. • Loader to Feed Hopper • Hopper to Conveyor • Conveyor to Screen No emissions are expected from the transfer points past the screen as the sand will be saturated with water.	Project will have the same number of transfer points as the Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Maximum Annual Sand Throughput (ton/yr) x Emission Factor (lb/ton) x (1 - Control Efficiency [%]) / 2,000 (lb/ton).	
Basis of Calculation	**Criteria air pollutant** and **TAC** emissions will be calculated using the emission factors and the Baseline throughput with control efficiency numbers from literature.	Same as Baseline, except the emission factors will be multiplied by the Project throughput.
Emission Factor	**Criteria Air Pollutants**: The uncontrolled sand transfer ***emission factor*** for PM_{10} will be obtained from AP-42 Chapter 11.12, *Concrete Batching*, Table 11.12-2. The $PM_{2.5}$ emission factor will be assumed to be 15% of PM_{10} emissions per Air District Permit Handbook Chapter 11.5, *Concrete Batch Plants*. **TAC**: The respirable crystalline silica ***emission factor*** will be obtained from the Journal of the Air & Waste Management Association (JAWMA) article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The emission factor will be calculated using the ratio of PM_4 crystalline silica to PM_{10}. The PM_4 crystalline silica will be calculated using the correlation of bulk material crystalline silica (wt %) to PM_4 crystalline silica per site-specific sampling results. See **Table A-8 in Appendix A** for more details.	Same as Baseline emission factors.
Maximum Annual Sand Throughput	The ***annual throughput*** evaluated will be 349,078 tons/year as provided by EP and Martin Marietta.	The ***annual throughput*** evaluated will be 800,000 tons/year in accordance with the ATC application.

Parameter	Baseline Scenario	Project Scenario
Control Efficiency	The second and third transfer points are abated by water spray system with an assumed control efficiency of 70% for PM_{10} per Air District Permit Handbook, Chapter 11.5. The same 70% control will be conservatively used for $PM_{2.5}$ per EP guidance. For reference, CalEEMod uses a 74% watering control efficiency for PM_{10} and $PM_{2.5}$ if surfaces are watered 3 times a day. As such, 70% control efficiency is conservative.	Same as Baseline.

Table 2-8. Emission Calculation Methodology – Stockpiles

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Material stockpiles at the Facility are used to store raw material, oversize material, and product.	Same as Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/acre-day) x Maximum Stockpile Size (acres) x 365 (days/yr) / 2000 (lb/ton) x (1 – Control Efficiency [%]).	
Basis of Calculation	Criteria pollutant and TAC emissions will be calculated using the emission factors and the Baseline acreages. Emissions will be calculated for each stockpile and totaled in the summary.	Same as Baseline, except the emission factors will be multiplied by the Project stockpile acreages.
Emission Factor	**Criteria Air Pollutants**: The PM_{10} wind erosion ***emission factor*** will be calculated using Equation 4-9 from EPA's *Control of Open Fugitive Dust Sources: Final Report* (September 1988) for wind emissions from continuously active piles. The $PM_{2.5}$ emission factor will be assumed to be 15% of PM_{10} emissions per Air District's Permitting Handbook. **TAC**: The respirable crystalline silica ***emission factor*** will be obtained from the JAWMA article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The emission factor will be calculated using the ratio of PM_4 crystalline silica to PM_{10}. The PM_4 crystalline silica will be calculated using the correlation of bulk material crystalline silica (wt %) to PM_4 crystalline silica per site-specific sampling results. See **Table A-9 of Appendix A** for more details.	Same as Baseline emission factor, except a lower emission factor is expected for the Product Pile as a result of the warehouse enclosure. See **Table A-9 of Appendix A** for more detail.
Maximum Stockpile Size	The ***maximum stockpile size*** will be based on the sizes during the Baseline provided by Martin Marietta. • 0.46 acres Raw Material Stockpile • 0.014 acres Oversized Stockpile • 0.238 acres Product Sand Stockpile	The ***maximum stockpile size*** of Project stockpiles will be based on values in the ATC Application: • 0.72 acres Raw Material Stockpile • 0.014 acres Oversized Stockpile • 0.31 acres Product Sand Stockpile

Parameter	Baseline Scenario	Project Scenario
Control Efficiency	All stockpiles are abated by water spray system with an assumed control efficiency of 70% for PM_{10} per Air District Permit Handbook, Chapter 11.5. The same 70% control will be conservatively used for $PM_{2.5}$ per EP guidance. For reference, CalEEMod uses a 74% watering control efficiency for PM_{10} and $PM_{2.5}$ if surfaces are watered 3 times a day. As such, 70% control efficiency is conservative.	Same as Baseline for the Raw Material and Oversized Stockpiles. Product stockpile will be in an enclosed warehouse. Control will be applied in the calculation of the emission factor.

Table 2-9. Emission Calculation Methodology – Fugitive Road Dust

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Emissions from loader and customer truck roadway travel within the Facility, and emissions from customer truck travel outside the Facility to customer sites during the Baseline scenario. Per the transportation analysis, 65% of trips terminate at the adjacent concrete plants (0.17 miles away) and the remaining 35% of trips terminate at a different offsite location (approx. 4.53 miles away on average). For emission calculation purposes, off-site emissions will be calculated using the weighted average trip distance between the adjacent concrete plants and other off-site locations. For modeling purposes, off-site emission rates will be calculated for travel to off-site delivery locations as follows: ► Adjacent concrete plants: Distance between the Facility and the CEMEX main entrance driveway: 0.17 miles. ► Other off-site locations: Distance between the Facility and the freeway: 1.17 miles.	Same as Baseline, except using the new Facility layout for trip lengths within the Facility. The truck trip ratio between adjacent concrete plants and other off-site locations is 65% to 35%, respectively, per the project average ratio provided by EP based on the methodology used in the transportation analysis.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/VMT) x Annual VMT (miles/yr) x (1 - Control Efficiency [%]) / 2,000 (lb/ton).	
Basis of Calculation	Loader criteria pollutant emissions will be calculated based on loader path. The entire loader path is unpaved, as such emissions will be calculated using the ***unpaved road emission factors*** listed below and Baseline ***annual VMT***. Customer truck criteria pollutant emissions will be calculated based on the customer truck path. Travel through paved roads within the Facility and on public roads will be calculated using the ***paved road emission factors*** and the Baseline truck ***annual VMT on paved roads.*** Travel through unpaved roads will be calculated using the ***unpaved road emission factors*** and the Baseline truck ***annual VMT on unpaved roads***. Loader and customer truck TAC emissions will be calculated using TAC emission factors listed below.	As part of facility improvements, most loader pathways and all customer truck pathways will be paved. Loader criteria pollutant emissions will be calculated using the ***paved and unpaved emission factors*** listed below and the projected loader ***annual VMT*** for travel on each respective type of roadway. Customer truck criteria pollutant emissions will be calculated using the **paved emission factor** listed below and the **projected truck VMT**. TAC calculations methodology will be the same as Baseline.

Parameter	Baseline Scenario	Project Scenario
Emission Factor	**Criteria Pollutants**: The PM_{10} and $PM_{2.5}$ emission factors for travel on paved roads will be calculated per AP-42 Chapter 13.2.1 Equation 2. The PM_{10} and $PM_{2.5}$ emission factors for travel on unpaved roads will be calculated per AP-42 Chapter 13.2.2 Equation 1a. See **Table A-10 of Appendix A** for more details. **TACs**: The respirable crystalline silica, arsenic, beryllium, cadmium, cobalt, copper, lead, nickel, selenium, vanadium, naphthalene, benzene, toluene, ethylbenzene, xylenes, hexavalent chromium, and mercury speciation will be per site-specific road dust sampling and analysis conducted in August 2024. Due to the paved nature of public roads, TAC emissions from travel off-site are assumed to be negligible.	Same as Baseline emission factors.

Parameter	Baseline Scenario	Project Scenario
VMT	***VMT*** will be calculated using trip length and number of loader and truck trips under the Baseline scenario. The trip length within the Facility will be measured using Google Earth with the route provided by the Project sponsor. For emission calculation purposes, the trip length outside the Facility will be the weighted average trip length calculated by EP based on the methodology from the transportation analysis. For modeling purposes, the trip length outside the Facility will be the distance between the Facility to the nearest interstate (1.17 miles), reflecting other off-site delivery locations, and to the adjacent concrete plants (0.17 miles), which are measured using Google Earth. For emission calculation purposes, the number of trips will be the actual average truck trips over the Baseline as provided by EP. For modeling purposes, the number of trips for the deliveries will be calculated by also applying the 65% adjacent concrete plant to 35% other off-site delivery ratio provided by EP (calculated using the Transportation Analysis methodology). See **Table A-10 in Appendix A** for more details.	Same as Baseline scenario, except using values for Project (i.e., updated trip lengths as measured with Google Earth for onsite travel and the weighted average trip lengths calculated by EP using the methodology from the transportation analysis for all off-site travel to adjacent concrete plants and other off-site delivery) based on project average. The number of trips will be calculated based on the loader or truck capacity and the Project throughput. See **Table A-10 in Appendix A** for more details.
Control Efficiency	The unpaved roads are controlled via watering with an assumed control efficiency of 70% for PM_{10} per the Air District's Permit Handbook. A 40% control efficiency will be used for $PM_{2.5}$ per the Air District's Permit Handbook. The paved roads within the Facility are controlled via watering with an assumed control efficiency of 70% per the Air District's Permit Handbook.	Same as Baseline control efficiency for paved and unpaved roads. In addition, unpaved loader travel will occur within the warehouse. The control efficiency for the warehouse will be 75% (wind screen on windward side), per Mojave Desert Air Quality Management District (MDAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries.

Table 2-10. Emission Calculation Methodology – Barge and Tugboats

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Barge and tugboat emissions result from engine exhaust during travel and hoteling.	Same as Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (g/bhp-hr) x 0.00220462 (lb/g) x Engine Power (bhp) x Annual Operating Time (hr/year) x Engine Load (%) / 2,000 (lb/ton).	
Basis of Calculation	**Criteria Air Pollutants:** Emissions will be calculated using the respective engine emission factors, engine load, engine horsepower, number of engines per vessel, operating times per trip, and the number of trips in the Baseline. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.	Same as Baseline, except the emission factors will be multiplied by the projected maximum annual operating time.
Emission Factor	***Emission factors*** for criteria pollutant emissions will be from EPA's Marine Compression-Ignition (CI) Engines certification database (June 28, 2004) based on the actual vessel engines provided by the Project sponsor. See **Table A-11 in Appendix A** for reference.	Same as Baseline emission factors.
Engine Power	***Engine power*** will be based on project-specific data. See **Table A-12 in Appendix A** for reference.	Same as Baseline engine power.
Annual Operating Time	The ***annual operating time*** will be based on the number of trips in the Baseline and the operating time per trip based on source activity as provided by the project sponsor.	The ***annual operating time*** will be based on the ATC Application. Annual operating time is assumed that barges are loaded to full capacity for each trip. See **Table A-12 in Appendix A** for reference.
Engine Load	***Engine load*** will be based on project-specific data.	Same as Baseline engine load factors.
Control Efficiency	None applied.	Same as Baseline.

Table 2-11. Emission Calculation Methodology – Off-Road Equipment Exhaust (Operational)

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Loaders, Water Truck, Forklifts, Man Basket, Bobcat, etc. utilized onsite to support Facility operations.	Same as Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (g/bhp-hr) x Equipment Horsepower (HP) x Load Factor x 0.00220462 (lb/g) x Total Annual Operating Hours (hr/year) / 2,000 (lb/ton)	
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated using the emission factors and the operating hours will be based on the historical operating schedule during the Baseline. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.	Same as Baseline, except assuming the maximum Project operating schedule will be used.
Emission Factor	Criteria pollutant ***emission factors*** will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-11 and averaged for Baseline Period 2020-2024. See **Table A-13 in Appendix A** for reference.	Same as Baseline emission factors, except using the emission factors for Year 2027. See **Table A-13 in Appendix A** for reference.
Equipment Horsepower	***Equipment horsepower ratings*** will be based on project-specific data as available. Otherwise, default horsepower ratings and load factors of the off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-13 in Appendix A** for reference.	Same as Baseline equipment horsepower.
Load Factor	***Equipment load factors*** will be based on project-specific data as available. Otherwise, default horsepower ratings and load factors of the off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-13 in Appendix A** for reference.	Same as Baseline load equipment load factors.
Annual Operating Hours	***Annual operating hours*** will be based on the operational schedule provided by Martin Marietta based on the Baseline conditions determined by EP. See **Table A-14 in Appendix A** for reference.	***Annual operating hours*** will be based on the operational schedule provided by Martin Marietta for the Project, which will be based on Air District permit limits, per EP guidance. See **Table A-14 in Appendix A** for reference.
Control Efficiency	All diesel equipment at site uses Tier 4 engines. No further control efficiency is applied as the CalEEMod emission factors account for the phase out of older engines as time goes on.	Same as Baseline. All diesel equipment will continue to use Tier 4 engines.

Table 2-12. Emission Calculation Methodology – On-Road Vehicle Emissions (Operational)

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Customer truck exhaust emissions during travel within the Facility boundary and travel outside of the Facility boundary to adjacent customer sites (concrete plants) or to other off-site locations during Baseline. Per the transportation analysis, 65% of trips terminate at the adjacent concrete plants (0.17 miles away) and the remaining 35% of trips terminate at a different off-site location (approx. 4.53 miles away on average). For emission calculation purposes, off-site emissions will be calculated using the weighted average trip distance between the adjacent concrete plants and other off-site locations. For modeling purposes, off-site emission rates will be calculated for travel to off-site delivery locations as follows: ► Adjacent concrete plants: Distance between the Facility and the CEMEX main entrance driveway: 0.17 miles. ► Other off-site locations: Distance between the Facility and the freeway: 1.17 miles.	Same as Baseline, except using travel lengths based on the new travel pathways within the Facility. The truck trip ratio between adjacent concrete plants and other off-site locations is 65% to 35%, respectively, per the project average ratio calculated by EP using the same methodology used by the transportation analysis.
Calculation Formula	**Running Annual Emissions (tpy)** = Running Emission Factors (g/mi) x Annual VMT (mi/yr). Converted to units of ton. **Idling Annual Emissions (tpy)** = Idling Emission Factors (g/trip/day) / 24 (hr/day) / 60 (mins/hr) x Idling time (mins/trip) x Annual Trips (trips/year). Converted to units of ton.	
Basis of Calculation	**Criteria Air Pollutants:** Running emissions will be calculated using the emission factors and the Baseline VMT. Idling emissions will be calculated using the emission factors, maximum idling time, and number of trips. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.	Same as Baseline, except the running emission factors will be multiplied by Project VMT and idling emissions factor will be multiplied by the assumed idling time and Project number of trips.
Emission Factor	Criteria pollutant ***emission factors*** will be the average for Calendar Years 2020 through 2024 from EMFAC2025 v2.0.0 for Region Type: Air District – Bay Area Air District for Vehicle Category T7 Single Dump Class.	Same as Baseline emission factor, except emission factors will be for Calendar Year 2027 only.

Parameter	Baseline Scenario	Project Scenario
	CARB's Off-Model EMFAC Adjustment Factors to Remove the Impact of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus and Warranty Phase I Regulations (October 2025) will be applied to the emission factors as applicable. ***Running emission factors*** will be obtained for emissions associated with the engine running (RUNEX), tire wear (PMTW), and brake wear (PMBW). ***Idling emission factors*** will be obtained for emissions associated with idling (IDLEX). It is assumed that customer trucks do not shut down engines during loading and that they are diesel fueled. See **Table A-15 in Appendix A** for reference.	
VMT	***VMT*** will be calculated using trip length and number of truck trips inside the Facility boundary and on public roads. The trip length within the Facility will be measured using Google Earth with the route provided by the Project sponsor. For emission calculation purposes, the trip length outside the Facility will be the weighted average trip length calculated by EP based on the methodology from the transportation analysis. For modeling purposes, the trip length outside the Facility will be the distance between the Facility to the nearest interstate (1.17 miles), reflecting other off-site delivery locations, and to the adjacent concrete plants (0.17 miles), which are measured using Google Earth. See **Table A-10 in Appendix A** for reference.	Same as Baseline scenario, except using values for Project (i.e., updated trip lengths as measured with Google Earth for onsite travel and the weighted average trip lengths calculated by EP using the methodology from the transportation analysis for off-site travel) based on project average. **VMT** will be calculated using trip length and number of truck trips inside the Facility boundary and on public roads. The trip length for the Project Period will be based on the updated Facility layout. See **Table A-10 in Appendix A** for reference.

Parameter	Baseline Scenario	Project Scenario
Annual Trips	For emission calculation purposes, the *number of trips* will be provided by Martin Marietta. These are the actual trips that occurred during the Baseline period. For modeling purposes, the number of trips for the all off-site deliveries (adjacent concrete plants and off-sites delivery) will be calculated by also applying the ratio calculated by EP using the methodology from the Transportation Analysis. See **Table A-10 in Appendix A** for reference.	Same as Baseline scenario, except the *number of truck trips* will be based on the ATC Application for the Project. See **Table A-10 in Appendix A** for reference.
Idling Time	Assumes a total of five (5) minutes of *idling time* per trip. This is a conservative estimate provided by Martin Marietta based on the loadout time, which is the time that each truck remains stationary to be loaded and weighed. Typical target loadout times are 3 minutes per truck, but 5 minutes is used to conservatively account for occasional loading and/or weighing delays.	Same as Baseline.
Control Efficiency	None applied.	Same as Baseline.

3. AIR DISPERSION MODELING METHODOLOGY

This section presents the air dispersion modeling methodology that will be used to evaluate potential health risk impacts from exposure to TACs, and $PM_{2.5}$ associated with the Project's construction and operational phases. Potential health risk impacts from exposure to TACs and $PM_{2.5}$ are evaluated to compare risks to the applicable San Francisco Planning Air Quality CEQA Thresholds of Significance. Construction emission sources will include off-road equipment. Operation emission sources will include emissions from material transfer, storage piles, fugitive road dust, barge and tug, off-road equipment, and on-road vehicles. Both the Baseline Period operational phase and Project operational phase will be modeled to determine the net Project impact.

The objective of the air dispersion modeling is to determine the Project's local risks and hazards, which will include cancer risk, chronic hazard index, acute hazard index and annual average $PM_{2.5}$ concentration impact. The Project's construction phase is not anticipated to include TACs with acute health impacts. The Project's cancer risk, chronic hazard index, and acute hazard index will be determined with HRA models in accordance with Appendix E. The annual average $PM_{2.5}$ ambient concentration will be modeled in accordance with U.S. EPA's Appendix W to Part 51 Guideline on Air Quality Models. Below is a list of the six (6) modeling scenarios:

- Construction phase HRA model
- Construction phase annual average $PM_{2.5}$ model
- Baseline Period operation phase HRA model
- Baseline Period operation phase annual average $PM_{2.5}$ model
- Project operation phase HRA model
- Project operation phase annual average $PM_{2.5}$ model

The following subsections describe such methodologies and the differences between the HRA and annual average $PM_{2.5}$ models where applicable. The latest versions of each software (e.g., AERMOD) available at the time of modeling will be agreed upon by EP and used.

3.1.1 Air Dispersion Model

AERMOD will be used with Trinity's *BREEZE™ AERMOD Suite* software to calculate ambient air concentrations at the specified receptor locations and heights using the regulatory default parameters as described in Chapter 2.3 of the AERMOD user guide (US EPA, 2024).

3.1.2 Coordinate System

The locations of emission sources and receptors will be represented in the Universal Transverse Mercator (UTM) coordinate system using the World Geodetic System (WGS84) projection. The UTM grid divides the world into coordinates that are measured in north meters (measured from the equator) and east meters (measured from the central meridian of a particular zone, which is set at 500 km).

3.1.3 Terrain Elevations

The terrain elevation for each receptor, emission source, and building will be imported from the United States Geological Survey (USGS) 1/3 arc-second National Elevation Dataset (NED). The terrain elevations will be determined from USGS data. The terrain height for each individual modeled receptor and emission source will be determined by assigning the interpolated height from the digital terrain elevations surrounding each modeled receptor and emission source.

3.1.4 Land Use Considerations

The land use categorization, urban or rural, is applied in AERMOD to determine whether turbulence associated with the urban heat island effect should affect the project's dispersion patterns. The land use category will be determined using AERSURFACE as recommended in Appendix E. AERSURFACE uses publicly available national land cover datasets and look-up tables of surface characteristics to classify land into 20 categories, of which four make up the urban categorization. If AERSURFACE determines that over 50% of the land within a 3-kilometer study radius from the Project classifies as developed, the urban categorization will be applied. Conversely, if less than 50% of the land within the studied radius classifies as developed, the rural categorization will be applied. If the Project classifies as an urban area, it will be modeled with an urban population of 827,526, according to the July 1, 2024, US Census population estimate (US Census Bureau, n.d.).

3.1.5 Meteorological Data

Meteorological data will be obtained from the Air District's AERMOD-ready meteorological data sets. Surface air data will be pulled from the San Francisco International Airport (KSFO) meteorological tower (Station ID 23234; elevation of 2.4 meters). KSFO is the most representative of the Project's site conditions as it is both one of the closest meteorological towers and oriented along the San Francisco Peninsula. Upper air data will use the Oakland International Airport (Station ID 23230), which is used for all modeling projects in the Bay Area.

3.1.6 Building Downwash

The emission sources at the Facility have been evaluated in terms of their proximity to nearby structures. The purpose of this evaluation is to determine if stack discharges may become caught in the turbulent wake of a building or structure. The downwash of the plume can result in elevated ground-level concentrations.

The Project operational phase includes an enclosure over the product sand stockpile. Truck idling emissions have the potential to become caught in the turbulent wake of the product sand enclosure. Therefore, the Building Profile Input Program (BPIP) with Plume Rise Model Enhancements (PRIME) will be used to determine the building downwash characteristics for the truck idling emission source in 10-degree directional intervals.

The construction and baseline operational phases are not expected to include any stack discharges that may become caught in the turbulent wake of a building or structure. As such, the BPIP with PRIME analysis will not be applicable to these air dispersion models.

3.1.7 Receptors

According to U.S. EPA regulations, "ambient air" is defined as the portion of the atmosphere external to the source, to which the general public has access. The dispersion modeling concentrations will be determined for ambient air locations (i.e., receptors). The Facility fence line will be the ambient air boundary for all modeling demonstrations.

The following ground-level receptors will be used to ensure ambient air is protected in the annual average $PM_{2.5}$ model and HRA model:

- Boundary receptors with 20-meter (m) spacing; and
- A 20-meter by 20-meter grid extending 1,000 meters in all directions from the facility center. The receptor grid will align with the Citywide HRA receptor grid. Additional 20-meter by 20-meter gridding

will be used to buffer the customer truck path roadways and worker and resident areas. The customer truck path receptor grid will extend a minimum of 1,000 feet (305 meters) from the customer truck path.

Figure 3-1 shows the proposed model receptor grid. All receptors for the HRA models will be set at a flagpole height of 1.8 meters to conservatively represent an average human's breathing height as recommended by EP's air quality guidance (San Francisco Planning Department, 2025).



Figure 3-1. Model Receptors

3.1.8 Emission Sources

3.1.8.1 Construction Phase

The construction phase involves emission sources which are best represented in AERMOD as area sources. Area sources are two-dimensional representations of diffused emissions emitted at a uniform height. The

fugitive exhaust emissions from grading, excavation, and off-road equipment will be summed and modeled as a polygon area source over the construction area. The construction area is contained within the bottom half of the facility. The construction phase is estimated to last up to seven months and will require minimal construction materials. Per Martin Marietta, the construction phase will have a total of 1,090 trips of equipment delivery, asphalt delivery, base underlay delivery, and soil haul trucks, and 1,400 trips of construction worker trucks. Averaged over the construction period of seven months, or conservatively 140 active construction days, the construction phase would have approximately 17.8 annual average daily traffic (AADT). EP's Air Quality Guidelines Appendix C provides a methodology for screening health impacts using a linear regression of AADT by vehicle type. The methodology includes emissions from exhaust, brake wear, tire wear, and entrained roadway dust and estimates maximum health risks representative of a receptor located adjacent to a roadway (e.g., a receptor on the sidewalk) For total AADT and a 95% quantile regression, it is conservatively estimated that 7,700 AADT would correlate to a 10 in one million risk. Applying this regression to the Project's construction trips of 17.8 total AADT correlates to a 0.02 in one million cancer risk. For $PM_{2.5}$, the 95% quantile total AADT regression correlates to a 0.0005 $\mu g/m^3$ annual average concentration. These conservative screening values will be added to the overall Project's impacts to conservatively review implications to health risk. Construction source parameters are summarized in **Table 3-1** below.

Table 3-1. Modeling Parameters - Construction Area Source

Source	Area (m^2)	Release Height (m)	Initial Vertical Dimension (m)
Construction Equipment [a, b]	Construction Area	1.30	1.21

a. Construction Equipment will be modeled as a single area source covering the construction area.
b. Release height and the initial vertical dimension are per the Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks (Air District, 2022).

3.1.8.2 Operational Phase

The operation phases, baseline and Project, involve emission sources which are best represented in AERMOD as point, area, or volume sources. Point sources are intended to represent emissions sources with an identifiable exhaust location and stack. The barge hoteling and idling emissions from haul trucks have identifiable exhaust parameters and are generally localized and thus will be represented as point sources. Similar to the construction phase, exhaust emissions from off-road equipment will be represented as a polygon area source over the Facility property. Stockpiles will also be modeled as area sources per Appendix E. Volume sources are three-dimensional sources of diffuse emissions, such as fugitive emissions. The Project's remaining fugitive emission sources, such as dust from material handling, truck and loader dust entrainment, and barge, truck, and loader exhaust emissions, will be represented as volume sources. Where there are receptors located within the volume source's exclusion zones, area sources will be used instead in accordance with EPA's haul route guidance (U.S. EPA, 2012). Both dust and exhaust area sources will be used. Source parameters for baseline and Project operation models are summarized in **Table 3-2** through **Table 3-4** below. Emission sources will be modeled to reflect **Figure 3-2** and **Figure 3-3**.

Table 3-2. Modeling Parameters – Baseline and Project Operation Point Sources

Source	Release Height (m)	Stack Temperature (K)	Stack Velocity (m)	Stack Diameter (m)
Baseline and Project				
Barge Hoteling [a]	15.20	573.15	20	0.30
Truck Idling [b]	2.55	644	17.8	0.305

a. Barge Hoteling parameters are from the San Francisco Citywide HRA Table 8 towboats at-berth parameters (San Francisco Department of Public Health, 2020).
b. Truck Idling parameters are from the San Francisco Citywide HRA Section 3.4 and Table 7 (San Francisco Department of Public Health, 2020).

Table 3-3. Modeling Parameters – Baseline and Project Operation Area Sources

Source	Area (m^2) [a, b]	Release Height (m)	Initial Vertical Dimension (m)
Baseline			
Raw Material Stockpile [c]	1,771	4.57	2.13
Product Sand Stockpile [c]	934	4.57	2.13
Oversize Material Stockpile [c]	70	4.57	2.13
Off-Road Equipment [d]	11,341	1.30	1.21
Off-site Transfer Truck Highway Dust Area [e]	22,778	3.40	3.16
Off-site Transfer Truck Highway Exhaust Area [g]	22,778	2.55	2.37
Off-site Transfer Truck Concrete Plant Dust Area [e]	3,341	3.40	3.16
Off-site Transfer Truck Concrete Plant Exhaust Area [g]	3,341	2.55	2.37
Unpaved Loader Dust Area [d]	197	1.30	1.21
Unpaved Loader Exhaust Area [f]	197	3.20	2.97
Unpaved Transfer Truck Dust Area [e]	358	3.40	3.16
Unpaved Transfer Truck Exhaust Area [g]	358	2.55	2.37
Paved Transfer Truck Dust Area [e]	186	3.40	3.16
Paved Transfer Truck Exhaust Area [g]	186	2.55	2.37
Project			
Raw Material Stockpile [c]	3,072	5.03	2.34
Product Sand Stockpile [c]	1,245	6.55	3.05
Oversize Material Stockpile [c]	59	2.59	1.21
Off-Road Equipment [d]	13,688	1.30	1.21
Off-site Transfer Truck Highway Dust Area [e]	22,778	3.40	3.16
Off-site Transfer Truck Highway Exhaust Area [g]	22,778	2.55	2.37
Off-site Transfer Truck Concrete Plant Dust Area [e]	3,341	3.40	3.16
Off-site Transfer Truck Concrete Plant Exhaust Area [g]	3,341	2.55	2.37
Unpaved Loader Dust Area [d]	441	1.30	1.21
Unpaved Loader Exhaust Area [f]	441	3.20	2.97
Paved Loader Dust Area [d]	279	1.30	1.21
Paved Loader Exhaust Area [f]	279	3.20	2.97
Paved Transfer Truck Dust Area [e]	413	3.40	3.16
Paved Transfer Truck Exhaust Area [g]	749	2.55	2.37

a. Facility areas and stockpile areas will be modeled based on **Figure 3-2** and **Figure 3-3** and calculated in AERMOD.
b. Dust and Exhaust areas will be modeled in accordance with EPA's haul route guidance and calculated in AERMOD (U.S. EPA, 2012).
c. Stockpile parameters were calculated per NSSGA Modeling Fugitive Dust Sources with AERMOD (NSSGA, 2007). Per section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. The average baseline raw material, product sand, and

oversize material stockpile heights are assumed to be 30 feet. The projected Project raw material stockpile height is 33 feet, the product sand stockpile height is 43 feet, and the oversize material stockpile height is 17 feet.

d. Release height and the initial vertical dimension are per the Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks (Air District, 2022).
e. Release height and the initial vertical dimension are per the Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks (Air District, 2022).
f. The Loader Exhaust Area release heights per Appendix E Table 7 recommendations and site-specific equipment dimensions. The release height was set equal to the equipment specific exhaust height above ground multiplied by a factor of 1.7 to account for the source's motion and 0.5. The initial vertical dimension is equal to the plume height divided by 2.15 per recommendation for surface-based sources. The Loader exhaust height above ground is approximated from online available equipment specifications for CAT Medium Wheel Loader Model 982XE (CAT, 2025).
g. Transfer Truck Exhaust Area parameters per the San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks (San Francisco Department of Public Health, 2020).

Table 3-4. Modeling Parameters – Baseline and Project Operation Volume Sources

Source	Number of Sources	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Baseline				
Transfer Point 1 – Off-loaded Pile to Hopper [a]	1	3.05	0.81	1.77
Transfer Point 2 – Hopper to Conveyor [b]	1	1.59	0.18	0.25
Transfer Point 3 – Conveyor to Scalping Screen [b]	1	6.25	0.18	2.06
Unpaved Loader Two-Way Road Dust [c, d]	4	1.30	9.33	1.21
Unpaved Loader Two-Way Road Exhaust [c, d]	4	3.20	9.33	2.97
Unpaved Transfer Truck One-Way Road Dust [c, e]	16	3.40	4.09	3.16
Unpaved Transfer Truck One-Way Road Exhaust [c, e]	16	2.55	4.09	2.37
Unpaved Loader Product Pile Dust [c, d]	6	1.30	5.64	1.21
Unpaved Loader Product Pile Exhaust [c, d]	6	3.20	5.64	2.97
Barge Traffic [f]	777	15.20	23.26	3.53
Project				
Transfer Point 1 – Off-loaded Pile to Hopper [a]	1	3.05	0.81	1.77
Transfer Point 2 – Hopper to Conveyor [b]	1	1.59	0.18	0.25
Transfer Point 3 – Conveyor to Scalping Screen [b]	1	6.25	0.18	2.06
Paved Loader Two-Way Road Dust [c, d]	5	1.30	9.90	1.21
Paved Loader Two-Way Road Exhaust [c, d]	5	3.20	9.90	2.97
Paved Transfer Truck One-Way Road Dust [c, e]	18	3.40	4.09	3.16
Paved Transfer Truck One-Way Road Exhaust [c, e]	18	2.55	4.09	2.37
Barge Traffic [f]	777	15.20	23.26	3.53

a. Transfer point 1 source parameters were determined per NSSGA section 5.3.6.5 guidance for Truck unloading and used Loader equipment specifications from CAT Medium Wheel Loader Model 982XE (CAT, 2025; NSSGA, 2007).
b. Transfer point 2 and 3 source parameters were determined per NSSGA section 5.3.2 for single, elevated, conveyor transfer points (NSSGA, 2007). The release height is equal to the distance from the ground to the center of the source, the initial lateral dimension is equal to the width of the conveyor divided by 4.3, and the initial vertical dimension is equal to the plume height (the total drop distance) divided by 4.3.
c. The Loader and Transfer Truck Road Dust and Exhaust release heights and initial vertical dimensions are equal to the Loader and Transfer Truck Dust and Exhaust Area release heights and initial vertical dimensions in **Table 3-3.**
d. Per the Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for two lane roadways is the road width plus 6 meters over 2.15 (Air District, 2022). The road width was estimated in Google Earth.
e. Per EPA Haul Road Workgroup Final Report, the initial lateral dimension for one lane roadways is the vehicle width plus 6 meters over 2.15 (EPA, 2011). The Transfer Truck vehicle width is approximated to be equal to the wheel wash width, 110 inches.
f. Barge Traffic parameters are from the San Francisco Citywide HRA Table 8 (San Francisco Department of Public Health, 2020).

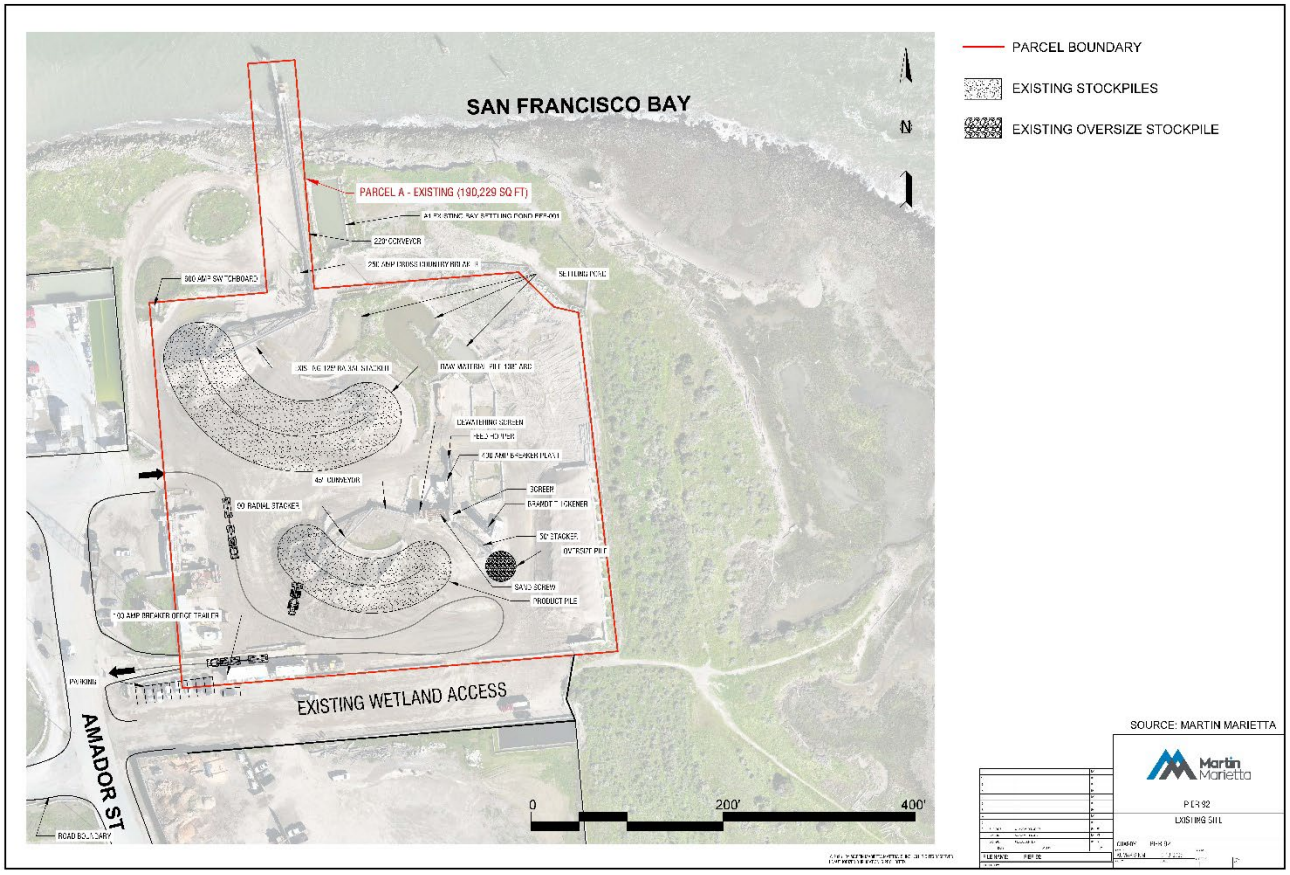
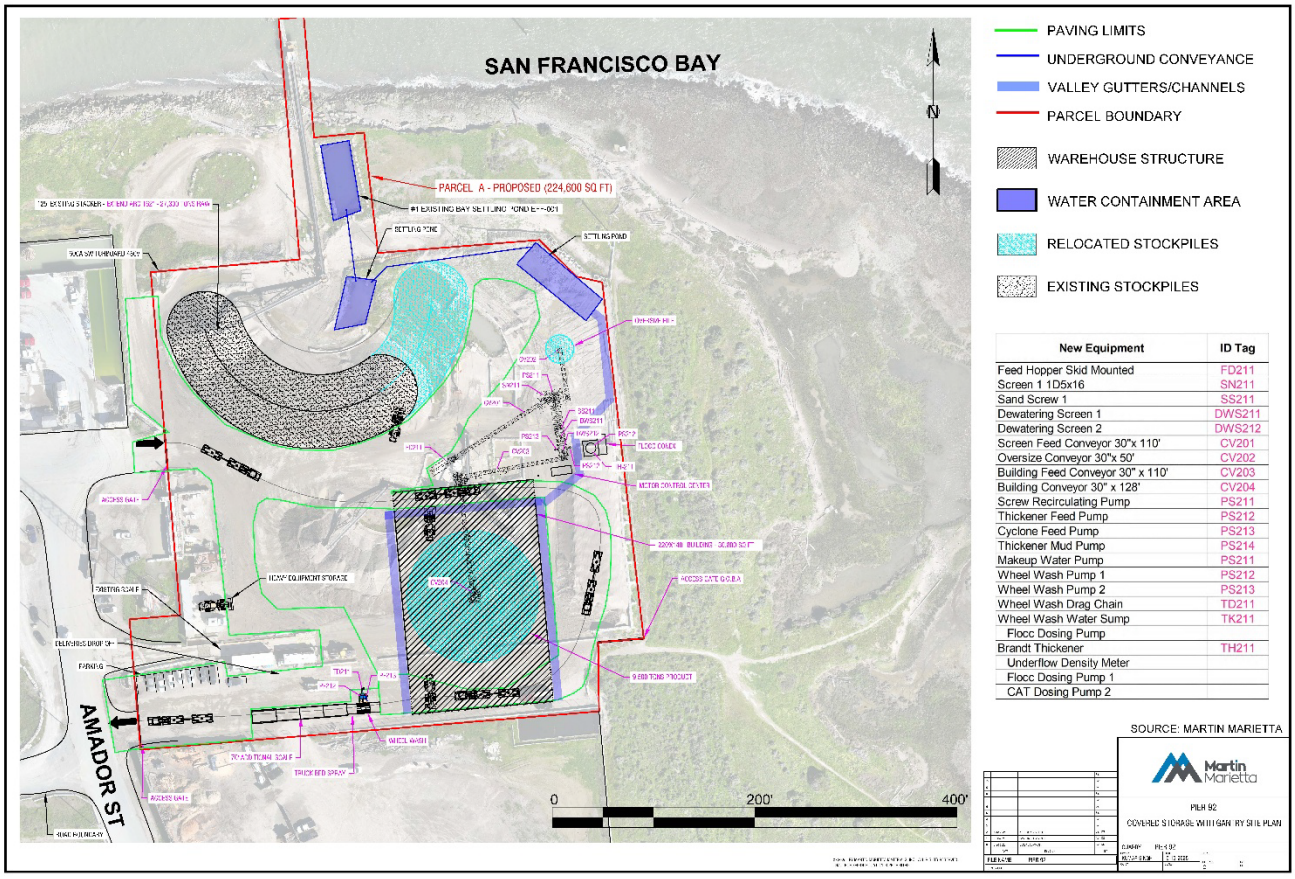


Figure 3-2. Facility Map – Baseline



New Equipment	ID Tag
Feed Hopper Skid Mounted	FD211
Screen 1 1D5x16	SN211
Sand Screw 1	SS211
Dewatering Screen 1	DWS211
Dewatering Screen 2	DWS212
Screen Feed Conveyor 30"x 110'	CV201
Oversize Conveyor 30"x 50'	CV202
Building Feed Conveyor 30" x 110'	CV203
Building Conveyor 30" x 128'	CV204
Screw Recirculating Pump	PS211
Thickener Feed Pump	PS212
Cyclone Feed Pump	PS213
Thickener Mud Pump	PS214
Makeup Water Pump	PS211
Wheel Wash Pump 1	PS212
Wheel Wash Pump 2	PS213
Wheel Wash Drag Chain	TD211
Wheel Wash Water Sump	TK211
Flocc Dosing Pump	
Brandt Thickener	TH211
Underflow Density Meter	
Flocc Dosing Pump 1	
CAT Dosing Pump 2	

Figure 3-3. Facility Map – Operational

3.1.9 Emission Rates

For annual average $PM_{2.5}$ modeling, the calculated annual $PM_{2.5}$ emissions representative of each source or source group converted to gram per second (g/s) will be used. The "$PM_{2.5}$" pollutant option will be used and the special analysis for SO_2, NO_2, or $PM_{2.5}$ NAAQS option in AERMOD will be disabled.

For the HRA models, the AERMOD dispersion model will be run with an equivalent unit emission rate of 1 g/s. Point sources and individual volume sources will be modeled with a unit emission rate of 1 g/s. For area sources, the emission rate will be converted into g/s-m^2 based on the source group's total area. For volume sources, the emission rate will be divided equally among the volume sources that make up each overall volume source group. The "Other" pollutant option will be selected.

4. HEALTH RISK ASSESSMENT METHODOLOGY

An HRA will be conducted in accordance with the Air District's Section 2-5 Health Risk Assessment Guidelines. Section 2-5 Health Risk Assessment Guidelines follow the Health Risk Assessment Guidelines adopted by Cal/EPA's OEHHA for use in the Air Toxics Hot Spots Program. The HRA will evaluate the Project's local risks and hazards, which will include cancer risk, chronic hazard index and acute hazard index. The HRA will be conducted using the methodology explained in the following sections.

4.1.1 Receptor Types

The HRA and $PM_{2.5}$ AERMOD models will contain a 20-meter by 20-meter grid extending 1,000 meters in all directions from the facility center, as well as additional 20-meter by 20-meter buffer gridding. The receptor grid will be used to evaluate the project risk. The following three key receptor types will be evaluated:

- The Maximally Exposed Individual Worker (MEIW) will be the highest impacted receptor which best aligns with a workplace as modeled with worker exposure pathways and duration. **Table 4-3** lists the nearest worker areas to the Project area.
- The Maximally Exposed Individual Resident (MEIR) will be the highest impacted receptor which best aligns with a residence as modeled with resident exposure pathways and duration. **Table 4-2** lists the nearest residential areas to the Project area.
- Sensitive receptors, as listed in **Table 4-1**.

Sensitive receptors are considered locations with people who are more sensitive than the general public to the effects of air pollutants. The reasons for increased sensitivity include preexisting health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be sensitive receptors because children, the infirm, and elderly people are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because residents are often home for extended periods of time which results in greater exposure to ambient air quality; therefore, residential receptors are evaluated as a separate receptor type from sensitive receptors. **Table 4-1** lists the nearest sensitive receptors within 1,000 meters of the Project's property boundary.[7] The list includes sensitive receptors potentially impacted by acute health risks (e.g., a medical facility where a sick person may visit for a single check-up per year) as well as sensitive receptors potentially impacted by chronic health risks (e.g., a medical facility where a patient may need to stay for long-term in-patient care or a school where a student would attend every weekday for many years).

[7] The sensitive receptors were identified using Google Earth and Google Maps.

Table 4-1. Sensitive Receptors near the Project Area

ID	Name of Sensitive Receptor	Address of Sensitive Receptor	Type	Distance from Property Boundary to Sensitive Receptor [miles] [a]
1	Bayview Child Health Center	1337 Evans Ave, San Francisco, CA 94124	Healthcare Facility	0.49
2	Bayview Child Health Center	3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	Healthcare Facility	0.52
3	Foster Care Mental Health	3801 3rd St, San Francisco, CA 94124	Healthcare Facility	0.59
4	Angel Childcare for Infants	1591 Hudson Ave, San Francisco, CA 94124	Daycare	0.68

Source: Google Earth, 2025

Table 4-2. Residential Areas near the Project

ID	Distance from Property Boundary to Residential Area [miles]
RES 1	0.62-0.67
RES 2	0.62-0.64
RES 3	0.57-0.59
RES 4	0.61-0.66

Source: Google Earth, 2025

Table 4-3. Worker Areas near the Project

ID	Distance from Property Boundary to Worker Area [meters]
WRK 1	150 - 715
WRK 2	310 - 975
WRK 3	430 - 930
WRK 4	445 - 945

Source: Google Earth, 2025

Figure 4-1 identifies the locations of the sensitive receptors and residential and worker areas listed in **Table 4-1**, **Table 4-2, and Table 4-3**.

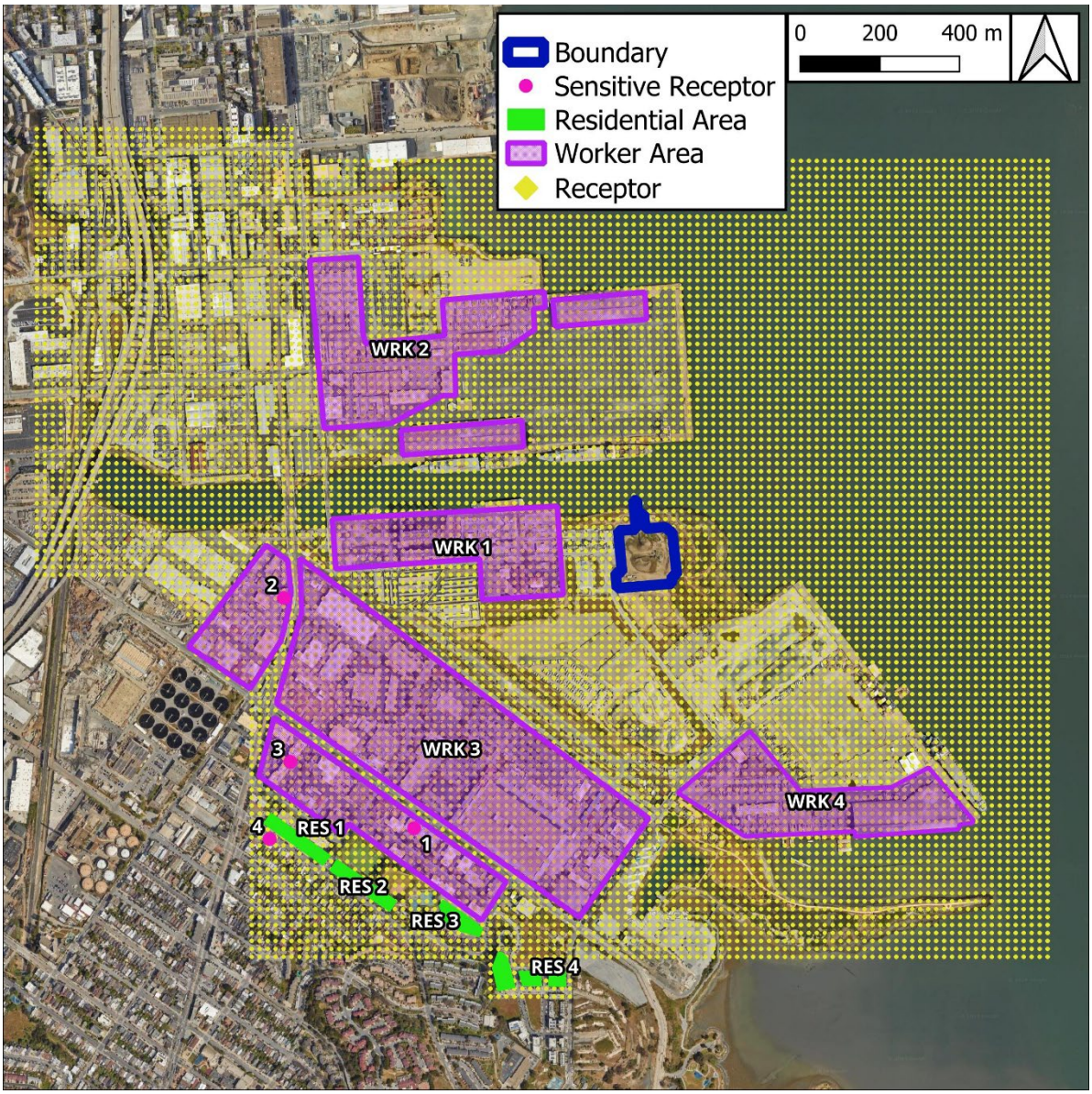


Figure 4-1. Location of Sensitive Receptors and Surrounding Residential and Worker Areas

The Project is not located within 1,000 feet of any school and thus a student scenario will not be evaluated as part of the HRA.

4.1.2 Exposure Pathways

Results from the HRA AERMOD air dispersion modeling will be combined with calculated hourly and annual TAC emission rates into the Hot Spots Analysis and Reporting Program (HARP) to model risk and exposure. The calculated annual TAC emission rates for the construction phase will account for the length of the construction phase.

Exposure pathways are generally classified as primary pathways and secondary pathways. Inhalation is the primary exposure pathway for all modeled sources and substances. For multi-pathway substances, non-inhalation exposure pathways will also be evaluated. Cancer risks and chronic and acute hazard indices will

be considered for the analysis. Only operational acute hazard indices will be considered as the Project's construction phase is not anticipated to include TACs with acute health impacts.

Residential cancer risks and chronic and acute hazard indices will be evaluated for the following default exposure pathways: dermal absorption, soil ingestion (reflecting a 0.02 m/s deposition rate for particulate-controlled sources), and mother's milk. The residential cancer risk will use the "Risk Management Policy" (RMP) Method to determine the daily breathing rate by age group. Worker cancer risks and chronic hazard indices will be evaluated based on default worker multi-pathway exposure for the following exposure pathways: dermal absorption, soil ingestion (reflecting a 0.02 m/s deposition rate for particulate-controlled sources), and an 8-hour breathing rate with moderate intensity. The worker cancer risk will use the OEHHA Derived Method to determine the daily breathing rate. HARP default parameters will be used for numerical pathway inputs.

A majority of the emission sources modeled represent non-continuously emitting sources, such as the off-road equipment and transfer truck dust and exhaust emissions which occur only during operating hours. The AERMOD model is set up to calculate normalized, long-term average concentrations as if the emission sources operate continuously. AERMOD's normalized, long-term average concentrations therefore include hours when zero emissions actually occur. However, off-site workers' operating schedules are expected to overlap with Project's operational schedule, meaning their exposure during the workday does not include any hours where zero emissions occur. To correct this, a Worker Adjustment Factor (WAF) is applied as consistent with the OEHHA Risk Assessment Guidelines equation 4.1, and reproduced below.

$$WAF = \frac{H_{residential}}{H_{source}} \times \frac{D_{residential}}{D_{source}} \times DF$$

Where:
WAF = worker adjustment factor
$H_{residential}$ = number of hours the long-term residential concentration is based on (24 hours)
H_{source} = number of hours the source operates
$D_{residential}$ = number of days per week the long-term residential concentration is based on (7 days)
D_{source} = the number of days the source operates per week.
DF = discount factor applied if the offsite worker's schedule partially overlaps with the source's operating schedule. For the Project, it is assumed that the sources' operating schedules will fully overlap with the offsite worker's schedule, thus the DF is 1 for the Project.

For the construction phase, a 4.2 WAF will be applied assuming that construction operations will occur for 8 hours per day and 5 days per week. For the baseline scenario, the actual operating schedule of 9 hours per day and 5 days per week is applied, which results in a WAF of 3.7. For the project scenario, the projected operating schedule of 12 hours per day and 5 days per week is applied, which results in a WAF of 2.8. The healthcare patients and daycare children are also assumed to be at their locations during the Project's operating hours, thus the WAF is also applied for those scenarios.

4.1.3 Exposure Duration

4.1.3.1 Construction Phase

The construction phase is considered a short-term, one-time event. To account for the brief nature of the construction phase, the User Defined (Tier 2) option will be applied in HARP. Exposure is assumed to begin at the third trimester of pregnancy and exposure duration is equal to the duration of the construction phase,

which is anticipated to last up to 7 months. Construction phase exposure parameters are listed in **Table 4-4**.

Table 4-4. Construction Phase Exposure Parameters

Population	Receptor Age Group	Daily Breathing Rate (L/kg-day)[a]	Exposure Duration (years)[b]	Fraction of Time at Home[c]	Exposure Frequency (days/year)[d]	Averaging Time (days)[e]	Age Sensitivity Factor[f]
Worker	16 to 70	230	0.584	-	153	25,550	1
Resident	3rd Trimester	361	0.25	1.0	213	25,550	10
	0 < 2	1,090	0.584	1.0	213	25,550	10
	2 < 16	572	0.584	1.0	213	25,550	3
	16 < 30	261	0.584	0.73	213	25,550	1
Healthcare Patients[g]	0 < 2	1,090	0.584	1.0	153	25,550	10
	2 < 16	572	0.584	1.0	153	25,550	3
Daycare Children	6 weeks < 2	1,090	0.584	1.0	153	25,550	10
	2 < 9	631	0.584	1.0	153	25,550	3

a. Daily breathing rate (L/kg-day) per OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA, 2015) and the Air District's Air Toxics NSR Program HRA Guidelines (Air District, 2016). For the worker population, the 95th percentile 8-hour breathing rate based on moderate activity will be used. For the resident and sensitive populations, the 95th percentile breathing rates will be used for age groups less than 2 years old and the 80th percentile breathing rates will be used for age groups greater than or equal to 2 years old.
b. Exposure Duration is equal to the duration of the construction phase except for the 3rd trimester age group, which is equal to 3 months (0.25 years), per OEHHA Air Toxics Hot Spots Program Guidance Manual and recommendations (OEHHA, 2015). The construction phase is anticipated to last up to 7 months, which rounded up is 0.584 years.
c. The fraction of time spent at home is conservatively assumed to be 1 (i.e. 24 hours/day) for age groups from 3rd trimester to less than 16 years old and 0.73 for adults aged 16-30 per the Air District's Air Toxics NSR Program HRA Guidelines (Air District, 2016). The fraction of time at home for daycare children and healthcare patients was conservatively set to 1 per OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA, 2015).
d. Exposure frequencies per OEHHA Air Toxics Hot Spots Program Guidance Manual recommendations (OEHHA, 2015). The exposure frequency for residents is equal to the duration of the construction phase, 7 months (213 days). The exposure frequency for workers assumes 5 working days per week for 7 months, about 30.42 weeks. The exposure frequency for daycare children and healthcare patients assumes 5 days per week for 7 months.
e. Averaging time for lifetime exposure, 70 years.
f. Age Sensitivity Factor per Table 8.3 of OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA, 2015).
g. Healthcare facilities near the project site listed in **Table 4-1** are for children. Therefore, the receptor age group was limited to 0 to 16 years of age.

4.1.3.2 Operation Phase

Consistent with Air District HRA Modeling Protocol, residential receptor exposure is assumed to begin prior to birth (during the third trimester of pregnancy) and continue for 30 years while worker exposure is assumed to begin at age 16 and continue for 25 years (Air District, 2020). Sensitive receptor exposure duration will be 16 years for healthcare patients and 5.9 years (rounded up to 6 years) for daycare children. For the residential scenario, the default fraction of time at residence for age bins greater than or equal to 16 years will be applied to account for adults spending a portion of the day away from their residence. Operation phase exposure parameters are listed in **Table 4-5.**

Table 4-5. Operation Phase Exposure Parameters[a]

Population	Receptor Age Group	Daily Breathing Rate (L/kg-day)	Exposure Duration (years)[b]	Fraction of Time at Home	Exposure Frequency (days/year)[b]	Averaging Time (days)	Age Sensitivity Factor
Worker	16 to 70	230	25	-	254 (Baseline)/ 262 (Project)	25,550	1
Resident	3rd Trimester	361	0.25	1.0	350	25,550	10
	0 < 2	1,090	2	1.0	350	25,550	10
	2 < 16	572	14	1.0	350	25,550	3
	16 < 30	261	14	0.73	350	25,550	1
Healthcare Patients	0 < 2	1,090	2	1.0	180	25,550	10
	2 < 16	572	14	1.0	180	25,550	3
Daycare Children	6 weeks < 2	1,090	1.9	1.0	180	25,550	10
	2 < 9	631	4.0	1.0	180	25,550	3

a. The receptor age group, daily breathing rate (L/kg-day), fraction of time at home, averaging time, and age sensitivity factor will be equal to parameters listed in **Table 4-4**.

b. Exposure duration and frequency for residents, healthcare patients, and daycare children are per OEHHA Air Toxics Hot Spots Program Guidance Manual and recommendations (OEHHA, 2015). The worker exposure frequency is adjusted to reflect the number of operating days per year for the Baseline and Project as provided by EP.

4.1.4 Net Project Analysis

The Facility will continue to operate during construction; therefore, the Project health risk impact will be equal to the sum of the construction phase and operation phase health risk. The HRA results from the Baseline Period will be subtracted from the Project period results to determine the Project's net health risk impact. The net health risk impact results will be analyzed in the environmental document to determine if the Project results in a significant health risk. The Citywide HRA Health Risk Significance Thresholds developed in collaboration with San Francisco Planning Department, San Francisco Department of Public Health, and the Air District will be used to determine the Project's significance. The Project is located within a Health Vulnerable zip code and the air pollutant exposure zone (San Francisco Planning Department, 2025). Therefore, the existing impacts and net project impacts will be compared to the applicable air pollutant exposure zone criteria for determining the applicable significance scenario.

4.1.5 Cumulative Analysis

The Cumulative HRA and annual average $PM_{2.5}$ modeling (the Cumulative Analysis) will assess the combined impacts from the Project's operation and construction phase, present and foreseeable projects, and existing stationary sources using the Citywide HRA results. The Cumulative Analysis will be compared to the San Francisco Planning Department Air Quality Health Risk Thresholds. The Project's operation phase encompasses existing impacts and the potential impacts from projected operations. Present and foreseeable projects will be determined in consultation with EP to determine which projects, if any, will affect the identified MEIR and MEIW from the Project. If such projects have published HRA or CEQA Air Quality Reports, the project-specific results will conservatively be applied to the Cumulative Analysis. The cancer risk, chronic hazard index, and ambient $PM_{2.5}$ concentrations from stationary sources within 1,000 feet of the Project and from roadway and railway impacts will be determined using the San Francisco Air Pollutant Exposure Zone modeling results. The Cumulative Analysis will incorporate quantitative analysis if

quantitative data is available. If no quantitative information is available for cumulative projects, the Cumulative Analysis will be qualitative.

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APPENDIX A. EMISSION CALCULATION INPUTS

Table A-1. Construction - Asphalt Paving - Emission Factors

Pollutant	Emission Factor (lb/acre)	Notes
ROG	2.62	CalEEMod refers to Sacramento Metropolitan Air Quality Management District's 1994 Air Quality Thresholds of Significance, First Edition.

Table A-2. Construction - Excavation Activity - Emission Factors and VMT

PM_{10} and $PM_{2.5}$ EF Formula	$EF_{TSP} = \frac{C_{TSP} \times (S^{1.2})}{M^{1.3}}$ $EF_{PM15} = \frac{C_{PM15} \times (S^{1.5})}{M^{1.4}}$ $EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$ $EF_{PM10} = EF_{PM15} \times F_{PM10}$
	EF = Emission factor, (lb/hr) CalEEMod refers to formula in AP-42 Chapter 11.9, Table 11.9-1, for "Bulldozing, Overburden".
	C = arbitrary coefficient used by AP-42 C_{TSP} = 5.7 C_{PM15} = 1
	s = Material silt content (%). Material silt content per Facility specification. If information is not available, default of 6.9% is applied, consistent with CalEEMod Section 4.4.2.
	$F_{PM2.5}$ = $PM_{2.5}$ scaling factor. The AP-42 default value is 0.105 (Chapter 11.9, Table 11.9-1).
	F_{PM10} = PM_{10} scaling factor. The AP-42 default value is 0.75 (Chapter 11.9, Table 11.9-1).
	M = Material moisture content (%). Moisture content per Facility specification. If information is not available, default of 7.9% is used, consistent with CalEEMod Section 4.4.2.

Table A-3. Constructions - Grading Above Grade - Emission Factors and VMT

PM_{10} and $PM_{2.5}$ EF Formula	$EF_{TSP} = 0.04 * (S^{2.5})$ $EF_{PM15} = 0.051 * (S^{2.0})$ $EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$ $EF_{PM10} = EF_{PM15} \times F_{PM10}$
	EF = Emission factor, (lb/VMT) CalEEMod refers to formula in AP-42 Chapter 11.9, Table 11.9-1, for "Grading".
	S = mean vehicle speed, mph. The AP-42 default value is 7.1 mph (Chapter 11.9, Table 11.9-1).
	$F_{PM2.5}$ = $PM_{2.5}$ scaling factor. The AP-42 default value is 0.031 (Chapter 11.9, Table 11.9-1).
	F_{PM10} = PM_{10} scaling factor. The AP-42 default value is 0.6 (Chapter 11.9, Table 11.9-1).
VMT Formula	$VMT = \frac{A_s}{W_b} \times \frac{43{,}560\ (\frac{sqft}{acre})}{5{,}280\ (\frac{ft}{mile})}$
	VMT = vehicle miles traveled, (mile/year)
	A_s = acreage of the grading site, (acre/yr). 1.5 acres of grading area per Project Sponsor.
	W_b = blade width of the grading equipment, (ft) If blade width information is not available, default blade width of 12 ft will be used per CalEEMod Appendix C, Section 4.4.1.

Table A-4. Construction - Off-Road Equipment Exhaust - Emission Factors

Type	Equipment	Quantity [1]	Construction Schedule [1]		Default HP [2]	Default Load Factor [2]	Emission Factors (g/bhp-hr) [3]			
			Hour/Day	Total Construction Days			PM_{10}	$PM_{2.5}$	NO_x	ROG
Aerial Lifts (25 - 50 hp)	Man Lift	1	8	40	46	0.31	0.020	0.019	2.870	0.151
Cranes (300 - 600 hp)	Crane	1	8	40	367	0.29	0.072	0.066	1.748	0.195
Forklifts (75 - 100 hp)	Gradall Forklift	1	8	140	82	0.2	0.092	0.085	2.152	0.228
Paver (75 - 100 hp)	Paver	1	8	15	81	0.42	0.119	0.110	2.450	0.229
Off-Highway Trucks (300 - 600 hp)	Water Truck	1	8	15	376	0.38	0.034	0.031	0.965	0.176
Tractors/Loaders/Backhoes (75 - 100 hp)	Bobcat	1	8	15	84	0.37	0.054	0.050	1.807	0.177
Rollers (25 - 50 hp)	Sheepsfoot Compactor	1	8	15	36	0.38	0.146	0.134	3.577	0.529
Rollers (25 - 50 hp)	Vibratory Drum Roller	1	8	30	36	0.38	0.146	0.134	3.577	0.529
Graders (100 - 175 hp)	Motor Grader	1	8	20	148	0.41	0.127	0.117	2.284	0.295

1. Off-Road equipment quantities and construction schedule were provided by EP on 7/31/2025, based off information provided by the Project Sponsor.
2. Default HP and load factor based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type.
3. Default Emission Factors for horsepower and 2027 construction year from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Assumes diesel-fueled equipment. Per CalEEMod User Guide Appendix C, these emission factors are based upon the calendar year specified in EMFAC.

Table A-5. Construction - On-Road Vehicle Emissions - Emission Factors

Vehicle Type		Non-Adjusted Emission Factors			
		PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	Running (g/mi) [1]	1.30E-01	4.97E-02	8.49E-01	1.22E-02
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	2.89E+00	0.00E+00
Heavy Duty Trucks (Asphalt Delivery)	Running (g/mi) [1]	1.30E-01	4.97E-02	8.49E-01	1.22E-02
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	2.89E+00	0.00E+00
Heavy Duty Trucks (Base Underlay Delivery)	Running (g/mi) [1]	1.30E-01	4.97E-02	8.49E-01	1.22E-02
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	2.89E+00	0.00E+00
Construction Worker Trucks	Running (g/mi) [3]	2.39E-02	1.22E-02	6.50E-02	2.79E-02
	Start-Up (g/trip) [4]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soil Haul Trucks	Running (g/mi) [5]	1.29E-01	4.91E-02	8.69E-01	1.08E-02
	Start-Up (g/trip) [6]	0.00E+00	0.00E+00	2.91E+00	0.00E+00

Vehicle Type		Adjustment Factor [7]			
		PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	T7 Single Other Class 8	1.030770355	1.029718034	1.056899163	1.022120531
Heavy Duty Trucks (Asphalt Delivery)	T7 Single Other Class 8	1.030770355	1.029718034	1.056899163	1.022120531
Heavy Duty Trucks (Base Underlay Delivery)	T7 Single Other Class 8	1.030770355	1.029718034	1.056899163	1.022120531
Construction Worker Trucks	LDT2	1	1	1	1
Soil Haul Trucks	T7 Single Dump Class 8	1.029507979	1.02758622	1.048645743	1.018793286

Vehicle Type			Adjusted Emission Factors [8]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	T7 Single Other Class 8	Running (g/mi)	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Heavy Duty Trucks (Asphalt Delivery)	T7 Single Other Class 8	Running (g/mi)	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Heavy Duty Trucks (Base Underlay Delivery)	T7 Single Other Class 8	Running (g/mi)	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Construction Worker Trucks	LDT2	Running (g/mi)	2.39E-02	1.22E-02	6.50E-02	2.79E-02
	LDT2	Start-Up (g/trip)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soil Haul Trucks	T7 Single Dump Class 8	Running (g/mi)	1.33E-01	5.05E-02	9.12E-01	1.10E-02
	T7 Single Dump Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00

1. Heavy Duty Trucks (Equipment/Delivery, Asphalt Delivery, and Base Underlay Delivery) emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Other Class 8 for RUNEX, PMTW, and PMBW.

2. Heavy Duty Trucks (Equipment/Delivery, Asphalt Delivery, and Base Underlay Delivery) emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Other Class 8 for STREX.

3. Construction Worker Trucks emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category LDT2 for RUNEX, PMTW, and PMBW.

4. Construction Worker Trucks emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category LDT2 for STREX.

5. Soil Haul Trucks emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW.

6. Soil Haul Trucks emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for STREX.

7. Adjustment factors per Appendix A - EMFAC2021 Adjustment Factors (October 2025) for each respective vehicle type in year 2027.

8. Adjusted Emission Factors = Non-Adjusted Emission Factors * Adjustment Factors.

Table A-6. Construction - On-Road Vehicle Emissions - Vehicle Miles Traveled

Vehicle Type	Total Trips in Construction Period [1, 2, 3, 4, 5]	Trip Length (mi/trip) [6]	Annual VMT (mi/yr) [7]
Heavy Duty Trucks (Equipment/Deliveries)	18	5.64	101.5
Heavy Duty Trucks (Asphalt Delivery)	248	14.1	3,496.8
Heavy Duty Trucks (Base Underlay Delivery)	410	4.9	2,009.0
Construction Worker Trucks	1,400	12.26	17,164.0
Soil Haul Trucks	414	5.64	2,335.0

1. Total Trips in Construction Period (Equipment Delivery Trucks) is assumed to be twice the number of the construction equipment units, accounting for delivery and removal of equipment from the site. It is assumed that one heavy duty truck will be used to deliver each construction equipment and the equipment will stay on site until construction completes.

2. Total Trips in Construction Period (Asphalt Delivery Trucks) = Asphalt Required (tons) / Delivery Truck Capacity (tons/truck) x 2. Per the project description, approximately 63,330 square feet of area will be paved with asphalt. Assuming 0.039 tons of asphalt is required per square foot, 2,470 tons of asphalt is required. Each haul truck's capacity is assumed to be 20 tons/truck. It is assumed that two trips will be required to account for delivery and return to the asphalt pickup location. Therefore, 248 round trips are required.

3. Total Trips in Construction Period (Base Underlay Trucks) = Base Underlay Required (tons) / Delivery Truck Capacity (tons/truck) x 2. Per the project description, approximately 63,330 square feet of area will require base underlay. Assuming 0.0645 tons of base underlay is required per square foot, 4,085 tons of base underlay is required. Each haul truck's capacity is assumed to be 20 tons/truck. It is assumed that two trips will be required to account for delivery and return to the base underlay pickup location. Therefore, 410 round trips are required.

4. Total Trips in Construction Period (Worker Trucks) = Total Trips per Day (trips/day) x Construction Period (days). Total trips per day is assumed to be 10 trips per day and construction period is 140 days provided by Martin Marietta (5 days per week x 28 weeks).

5. Total Trips in Construction Period (Soil Haul Trucks) = Soil Excavated During Construction (cubic yards) / Haul Truck Capacity (cubic yards/truck) x 2. Per the project description, approximately 3,305 cubic yards of soil will be removed. Each haul truck's capacity is 16 cubic yards, per CalEEMod v2022.1 User Guide, Section 4.6.1. It is assumed that two trips will be required to account for delivery and return to the base underlay pickup location.

6. Default miles per trip from CalEEMod 2022.1 User Guide Appendix G, Table G-15, *2015 California Statewide Travel Demand Model Trip Lengths and Purpose Splits by Trip Type (Aggregated by Analysis Level)* , San Francisco Bay Area, Nonresidential Trip Length, Other-Other (Equipment/delivery trucks and soil haul trucks) and Home-Work (Construction Worker Trucks). Trip length for asphalt delivery trucks and base underlay trucks per project information.

7. Annual VMT (mi/yr) = Total Trips in Construction Period (trips/period) * Trip Length (mi/trip).

Table A-7. Construction - Fugitive Road Dust Emissions

Paved Roads
PM_{10} and $PM_{2.5}$ Emission Factor Formula

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

AP-42 Chapter 13.2.1 (updated January 2011) Equation 2

E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1
$sL_{\text{Equipment Delivery Truck}}$ =	0.020		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway. The remainder of distance traveled by the construction on-road vehicles are represented using the Freeway silt loading.
$sL_{\text{Asphalt Delivery Truck}}$ =	0.017		
$sL_{\text{Base Underlay Truck}}$ =	0.020		
$sL_{\text{Construction Worker Truck}}$ =	0.017		
$sL_{\text{Soil Haul Truck}}$ =	0.020		

Segment	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Freeway (Equipment Delivery Trucks)	23,601	0.015	Distance is the difference between Off-Site Travel Distance and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines, Appendix E*, Table 22 for Freeways.
Freeway (Asphalt Delivery Trucks)	68,270	0.015	
Freeway (Base Underlay Delivery Trucks)	19,694	0.015	
Freeway (Construction Worker Trucks)	58,555	0.015	
Freeway (Soil Haul Trucks)	23,601	0.015	

W = 2.4 — Mean vehicle weight (tons) on paved roadway, per default from CalEEMod, Appendix C, Section 5.1.4.

P = 65 — Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.

N = 365 — Number of days in the averaging period

VMT, Trip Length, and Max No. of Annual Trips

Refer to Table A-6 of Appendix A.

Table A-8. Operational - Material Transfer Points - Emission Factors

Pollutant	Emission Factor (lb/ton)	Notes
PM_{10}	9.90E-04	PM_{10} emission factor for sand transfer per AP-42, Chapter 11.12 Concrete Batching, Table 11.12-2.
$PM_{2.5}$	1.49E-04	$PM_{2.5}$ emission factor per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM10 emissions.
Crystalline Silica	1.02E-04	Crystalline silica emission factor = PM_{10} emission factor x Site-specific respirable crystalline silica weight percent. Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM_4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The site-specific bulk material crystalline silica (wt %): 30.6% Resultant respirable crystalline silica emission factor (wt %): 10.3%

Table A-9. Operational - Stockpiles - Emission Factors

PM_{10} and $PM_{2.5}$ Emission Factor Formula	$E_{TSP} = (1.7)\left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right)$ (lb/acre-day)			Equation 4-9 from Control of Open Fugitive Dust Sources (EPA-450/3-88-008, September 1988)
		E_{TSP} = Total Suspended Solids emission factor, lb/acre/day		
		s=	1.58	Silt content of sand (%). Material passing the 200 mesh: average 0.5% and range of 0.2-1.58%.
		p=	65	Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.2-1.
		f=	13.3	Percentage of time that the unobstructed wind speed exceeds 12 mph at the Raw Material Stockpile is based on Mojave Desert Air Quality Management District (MDAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries, Wind Erosion from Stockpiles section. Used for baseline (raw material, oversized, and product) and Project (raw material and oversized).
		f=	1.0	Percentage of time that the unobstructed wind speed exceeds 12 mph at the Product Stockpile is estimated to be at 1%. The enclosure for the Product Stockpile is only open on the North and South ends and partially enclosed otherwise. Used only for Project (product).
		PM_{10}=	$0.5*E_{TSP}$	
		$PM_{2.5}$=	$0.15*PM_{10}$	Per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM_{10} emissions.
Crystalline Silica EF	10.3% x PM_{10} Emission Factor	Crystalline silica emission factor = PM10 emission factor x Site-specific respirable crystalline silica weight percent. Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The site-specific bulk material crystalline silica (wt %): 30.6% Resultant respirable crystalline silica emission factor (wt %): 10.3%			

Table A-10. Operational - Fugitive Road Dust - Emission Factors

Unpaved Roads
PM_{10} and $PM_{2.5}$ Emission Factor Formula

$$E = k(\frac{s}{12})^a \times (\frac{W}{3})^b$$

AP-42 Chapter 13.2.2 (updated November 2006) Equation 1a

E= Size-specific emission factor (lb/VMT)

$s_{front\ loader}$= 7.1 — Surface material silt content (%) for sand and gravel processing (material storage area mean)

$s_{customer\ truck}$= 4.8 — Surface material silt content (%) for sand and gravel processing (plant road mean)

a,b,k= Constants per Table 13.2.2-2 for industrial roads

	PM_{10}	$PM_{2.5}$
k =	1.5	0.15
a =	0.9	0.9
b =	0.45	0.45

W= Mean vehicle weight (tons)

Paved Roads
PM_{10} and $PM_{2.5}$ Emission Factor Formula

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

AP-42 Chapter 13.2.1 (updated January 2011) Equation 2

E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1

$sL_{within\ Facility\ boundary}$= 12 — Road surface silt loading (g/m^2) for Concrete Batching Facility (AP-42 Chapter 13.2.1)

$sL_{outside\ Facility\ boundary,\ emissions}$= 0.031 — Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway.

$sL_{outside\ Facility\ boundary,\ Modeling\ -\ Off\ Site\ Locations}$= 0.038 — Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below, excluding travel on Freeways.

$sL_{outside\ Facility\ boundary,\ Modeling\ -\ Adjacent\ Plants}$= 0.116 — Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street (North/South and East/West bound). The distance traveled on the East/West bound segment of Amador street is 635 feet as measured in Google Earth.

Segment	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
Freeway	2,798	0.015	Distance is the difference between Off-Site Travel Distance (Emissions) and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines, Appendix E*, Table 22 for Freeways.

W = Mean vehicle weight (tons). Note that actual vehicle weight for customer truck travel outside the facility boundary was conservatively used in lieu of the CalEEMod default vehicle weight of 2.4 tons.

P = 65 — Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.

N = 365 — Number of days in the averaging period

VMT, Trip Length, and Max No. of Annual Trips

$$VMT\left(\frac{mi}{yr}\right) = Trip\ Length\ (mi/trip)\ x\ Maximum\ Number\ of\ Annual\ Trips(trip/yr)$$

Trip Length (miles) = Vehicle distance traveled as estimated in Google Earth.

	Baseline Value (ft)	Project Value (ft)	
Unpaved Road Front Loader Path =	120	50	
Paved Road Front Loader Path =	0	150	
Unpaved Road Customer Trucks Path =	745	--	
Paved Road Customer Trucks Path =	215	775	Inside Facility
Paved Road Customer Trucks Path (Project Emissions) =	8,976	8,976	Outside Facility [1]
Paved Road Customer Trucks Path (to Freeway) =	6,178	6,178	Outside Facility [2]
Paved Road Customer Trucks Path (to Adjacent Plants) =	898	898	Outside Facility [2]

1. Values per weighted average trip length (concrete plants + other off-site locations/direct deliveries) provided by the Transportation Analysis for baseline and Project Average are used for emission calculation.

2. For air dispersion modeling purposes, the trip lengths outside the Facility boundary are the distance between the Facility to the nearest interstate, reflecting other off-site delivery locations, and the distance between the Facility and the CEMEX main entrance driveway, reflecting the adjacent concrete plants.

Maximum No. of Annual Trips = Baseline Annual Trips are based on the actual trips during Baseline Period (Jan 1, 2020 - Dec 31, 2024) provided by EP divided by 5 years, which is 70,954 trips/5 yr. Project maximum annual trips are estimated by dividing the annual throughput values by the vehicle capacity.

Baseline Truck Trips (Within Facility Boundary) =	14,191	customer truck trips/yr	Inside Facility [3]
Baseline Truck Trips (Outside Facility Boundary) =	28,382	customer truck trips/yr	Outside Facility [3]
Baseline Truck Trips (Outside Facility Boundary, to Freeway) =	9,934	customer truck trips/yr	Outside Facility [4]
Baseline Truck Trips (Outside Facility Boundary, to Adjacent Plants) =	18,448	customer truck trips/yr	Outside Facility [4]
Project Truck Trips (Within Facility Boundary) =	40,000	customer truck trips/yr	Inside Facility [3]
Project Truck Trips (Outside Facility Boundary) =	80,000	customer truck trips/yr	Outside Facility [3]
Project Truck Trips (Outside Facility Boundary, to Freeway) =	28,000	customer truck trips/yr	Outside Facility [4]
Project Truck Trips (Outside Facility Boundary, to Adjacent Plants) =	52,000	customer truck trips/yr	Outside Facility [4]
Front Loader Capacity =	22,000	lb	
Customer Trucks Capacity =	40,000	lb	

3. Customer truck trip within the Facility boundary is one-way only. Customer truck trip outside the Facility boundary is multiplied by 2 to account for travel to/from the site.

4. Trip ratios to off-site locations (35%) and adjacent plants (65%) are based on the Transportation Analysis for Baseline and Project Average.

	Pollutant	TAC Speciation (wt %) [1]	Vehicle Type
TAC Speciations	Hexavalent chromium	0.00000018	Loader
	Mercury	0.000000017	Loader
	Arsenic	0.0000073	Loader
	Beryllium	0.000000043	Loader
	Cadmium	0.00000004	Loader
	Cobalt	0.000006	Loader
	Copper	0.0000046	Loader
	Lead	0.0000038	Loader
	Nickel	0.00004	Loader
	Selenium	0.000000105	Loader
	Vanadium	0.000026	Loader
	Crystalline Silica	0.272976052	Loader
	Benzene	0.00000024	Loader
	Toluene	0.00000024	Loader
	Ethylbenzene	0.00000024	Loader
	Xylenes	0.00000024	Loader
	Naphthalene	0.0000094	Loader
	Hexavalent chromium	0.00000014	Truck
	Mercury	5.5E-09	Truck
	Arsenic	0.00001	Truck
	Beryllium	0.00000013	Truck
	Cadmium	0.00000004	Truck
	Cobalt	0.0000069	Truck
	Copper	0.0000066	Truck
	Lead	0.0000036	Truck
	Nickel	0.000045	Truck
	Selenium	0.000000105	Truck
	Vanadium	0.000031	Truck
	Crystalline Silica	0.272976052	Truck
	Benzene	0.00000064	Truck
	Toluene	0.00000064	Truck
	Ethylbenzene	0.00000064	Truck
	Xylenes	0.00000064	Truck
	Naphthalene	0.000028	Truck
	1. TAC speciation percentages are from site-specific analytical sampling taken August 1, 2024.		

Table A-11. Operational - Barge and Tugboats - Emission Factors

Engine	Engine Power		Emission Factors [1]		
	Total Power (bhp)	Load (%)	$PM_{10}/PM_{2.5}$ (g/bhp-hr)	NO_x (g/bhp-hr)	ROG (g/bhp-hr)
Tugboat - Main Engine	2,400	30	0.05	3.54	0.19
Tugboat - Generator Engine	198	60	0.07	3.40	0.18
Barge - Main Engine	1,750	60	0.03	3.97	0.21
Barge - Generator Engine	257	60	0.04	3.51	0.12
Barge - Bow Thruster Engine	375	60	0.05	3.65	0.11

1. NOx, ROG, PM10/PM2.5 emission factors per EPA's Marine Compression-Ignition (CI) Engines certification database. EPA's Marine CI database provided a NOx + NMHC emission factor for the main engine which is assumed to be 95% NOx and 5% VOC based on the BAAQMD's policy, CARB Emission Factors for CI Diesel Engines (effective June 28, 2004).

Table A-12. Operational - Barge and Tugboats - Specifications and Annual Operating Time

Parameter	Tugboat - Main Engine	Tugboat - Generator Engine	Barge - Main Engine	Barge - Generator Engine	Barge - Bow Thruster Engine
Model	Caterpillar C32	John Deere Powertech 4045TFM85	Caterpillar 3512C	Caterpillar C7.1	Caterpillar C9.3
Engine Family Name	FCPXN32.1EP3	FJDXN04.5146	ECPXN78.1AT3	GPKXN07.0BP1	GCPXN09.3EB3
Engine Power (bhp)	1,200	99	1,750	257	375
Engines per vessel	2	2	1	1	1
Operating time per trip (each) (hr/trip) [1]	2.5	8	4	24	1
Barge Capacity (tons/trip)	3,250				
Baseline Max Throughput (tons/yr) [2]	349,078				
Baseline Max Annual Barge Trips (trips/yr) [3]	110				
Project Max Throughput (tons/yr) [2]	800,000				
Project Max Annual Barge Trips (trips/yr) [3]	250				
Baseline Operating time per year (each) (hr/yr) [1]	275	880	440	8,760	110
Project Operating time per year (each) (hr/yr) [1]	625	2,000	1,000	8,760	250

1. The tugboat main engines operate for the 1.25 hour journey between the sand mine and Pier 92, for a round-trip time of 2.5 hours per trip.
A tugboat generator engine operates 8 hours per trip. When not in use, the tugboat will be on shore power.
The barge main engine operates for 4 hours during each unloading process.
The barge generator engine operates continuously. A maximum operation of 365 days per year is reflected.
The barge bow thruster engine operates during the maneuvering process into and out of the pier unloading position for approximately 30 minutes to 1 hour (total) per trip.
2. Project Max Throughput per ATC Application
3. Project Max Annual Barge Trips (trips/year) = Project Max Throughput (tons/year) / Barge Capacity (tons/trip).

Table A-13. Operational - Off-Road Equipment - Emission Factors

Type	Equipment	HP [1]	Default Load Factor [2]	Year	Emission Factors (g/bhp-hr) [3]			
					PM_{10}	$PM_{2.5}$	NO_x	ROG
Rubber Tired Loader (300 - 600 bhp)	Rubber Tired Loaders	350	0.36	2020 - Baseline	0.118	0.109	3.146	0.302
				2021 - Baseline	0.099	0.091	2.630	0.266
				2022 - Baseline	0.086	0.079	2.277	0.244
				2023 - Baseline	0.074	0.068	1.966	0.225
				2024 - Baseline	0.068	0.063	1.796	0.219
				Average - Baseline	**0.089**	**0.082**	**2.363**	**0.251**
				2027 - Project	**0.046**	**0.042**	**1.203**	**0.188**
Off-Highway Trucks (100 - 175 bhp)	Water Truck	150	0.38	2020 - Baseline	0.140	0.129	2.668	0.315
				2021 - Baseline	0.116	0.107	2.289	0.284
				2022 - Baseline	0.091	0.084	1.856	0.246
				2023 - Baseline	0.085	0.078	1.736	0.242
				2024 - Baseline	0.073	0.067	1.542	0.229
				Average - Baseline	**0.101**	**0.093**	**2.018**	**0.263**
				2027 - Project	**0.053**	**0.049**	**1.062**	**0.194**
Forklifts (75 - 100 bhp)	Forklifts	82	0.2	2020 - Baseline	0.302	0.278	4.067	0.450
				2021 - Baseline	0.261	0.240	3.683	0.402
				2022 - Baseline	0.216	0.199	3.285	0.352
				2023 - Baseline	0.182	0.168	2.981	0.316
				2024 - Baseline	0.157	0.145	2.751	0.292
				Average - Baseline	**0.224**	**0.206**	**3.353**	**0.362**
				2027 - Project	**0.092**	**0.085**	**2.152**	**0.228**
Aerial Lifts (25 - 50 bhp)	Man Basket	46	0.31	2020 - Baseline	0.031	0.028	2.953	0.167
				2021 - Baseline	0.027	0.024	2.920	0.165
				2022 - Baseline	0.024	0.022	2.905	0.162
				2023 - Baseline	0.023	0.021	2.895	0.162
				2024 - Baseline	0.022	0.020	2.886	0.158
				Average - Baseline	**0.025**	**0.023**	**2.912**	**0.163**
				2027 - Project	**0.020**	**0.019**	**2.870**	**0.151**
Tractors/Loaders/Backhoes (50 - 75 bhp)	Bobcat	75	0.37	2020 - Baseline	1.013	0.932	12.627	1.608
				2021 - Baseline	1.015	0.934	12.678	1.615
				2022 - Baseline	1.010	0.929	12.477	1.590
				2023 - Baseline	1.009	0.928	12.404	1.582
				2024 - Baseline	1.025	0.943	12.795	1.630
				Average - Baseline	**1.014**	**0.933**	**12.596**	**1.605**
				2027 - Project	**1.002**	**0.922**	**12.173**	**1.556**

1. HP for rubber tired loader, water truck and bobcat are based on actual equipment specifications provided by Martin Marietta. Default HP for forklifts and man basket are based on CalEEMod 2021.1 User Guide Appendix G, Table G-12,*Horsepower and Load Factors for Construction Equipment by Fuel Type,* for forklifts and aerial lifts.

2. Default load factors are based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, *Horsepower and Load Factors for Construction Equipment by Fuel Type.*

3. Default Emission Factors for horsepower from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Baseline emission factors are averaged across the Baseline Period (2020-2024). Project emission factors are from 2027.

Table A-14. Operational - Off-Road Equipment - Project Operational Schedule

Equipment	Quantity[3]		HP [1]	Default Load Factor [2]	Daily Operating Hours per Equipment (hr/day) [3]		Operational Days (days/year) [3]		Total Equipment Annual Operating Hours (hr/yr) [4]	
	Baseline	Project			Baseline	Project	Baseline	Project	Baseline	Project
Rubber Tired Loaders	1	2	350	0.36	9	12	254	262	2,286	6,288
Water Truck	1	1	150	0.38	2	2	254	262	508	524
Forklifts/Telehandler	1	1	82	0.20	0.5	0.5	254	262	127	131
Man Basket	1	1	46	0.31	0.5	0.5	254	262	127	131
Bobcat	1	1	75	0.37	0.5	0.5	254	262	127	131

1. HP for rubber tired loader, water truck and bobcat are based on actual equipment specifications. Default HP for forklifts and man basket are based on CalEEMod 2021.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type, for forklifts and aerial lifts.

2. Default load factors are based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type.
3. Equipment quantity and operational schedule provided using the "Revised Data for Pier 92 AQ-HRA Recalculations.pdf" provided by the EP on 11/22/2025.
4. Total Equipment Annual Operating Hours (hr/yr) = No. of Equipment * Daily Operating Hours per Equipment (hr/day) * Operational Days (day/year).

Table A-15. Operational - On-Road Vehicle - Emission Factors

Vehicle Type		Year	Non-Adjusted Emission Factors			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Transfer/Customer Truck	Running (g/mi) [1]	2020 - Baseline	2.16E-01	1.29E-01	4.14E+00	1.51E-01
		2021 - Baseline	1.92E-01	1.07E-01	3.45E+00	1.13E-01
		2022 - Baseline	1.82E-01	9.73E-02	3.18E+00	9.79E-02
		2023 - Baseline	1.35E-01	5.47E-02	1.54E+00	1.63E-02
		2024 - Baseline	1.33E-01	5.28E-02	1.38E+00	1.39E-02
		Average - Baseline	**1.72E-01**	**8.81E-02**	**2.74E+00**	**7.84E-02**
		2027 - Project	**1.29E-01**	**4.91E-02**	**8.69E-01**	**1.08E-02**
	Idling (g/vehicle/day) [2]	2020 - Baseline	1.12E-01	1.07E-01	2.64E+01	2.01E+00
		2021 - Baseline	8.24E-02	7.89E-02	2.58E+01	1.95E+00
		2022 - Baseline	7.03E-02	6.73E-02	2.55E+01	1.93E+00
		2023 - Baseline	1.18E-02	1.13E-02	2.24E+01	1.81E+00
		2024 - Baseline	9.44E-03	9.03E-03	2.03E+01	1.81E+00
		Average - Baseline	**5.72E-02**	**5.47E-02**	**2.41E+01**	**1.90E+00**
		2027 - Project	**6.08E-03**	**5.82E-03**	**1.24E+01**	**1.83E+00**

Vehicle Type		Year	Adjustment Factor [3]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Transfer/Customer Truck	T7 Single Dump Class 8	2020 - Baseline	1	1	1	1
		2021 - Baseline	1	1	1	1
		2022 - Baseline	1.000000003	1.000000008	1.000000134	1
		2023 - Baseline	1.000037736	1.000037861	1.000066462	1.000044491
		2024 - Baseline	1.001736675	1.001608346	1.001831401	1.001204779
		2027 - Project	1.029507979	1.027586220	1.048645743	1.018793286

Vehicle Type		Year	Adjusted Emission Factors [4]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Transfer/Customer Truck	Running (g/mi)	2020 - Baseline	2.16E-01	1.29E-01	4.14E+00	1.51E-01
		2021 - Baseline	1.92E-01	1.07E-01	3.45E+00	1.13E-01
		2022 - Baseline	1.82E-01	9.73E-02	3.18E+00	9.79E-02
		2023 - Baseline	1.35E-01	5.47E-02	1.54E+00	1.63E-02
		2024 - Baseline	1.33E-01	5.28E-02	1.39E+00	1.39E-02
		Average - Baseline	**1.72E-01**	**8.81E-02**	**2.74E+00**	**7.84E-02**
		2027 - Project	**1.33E-01**	**5.05E-02**	**9.12E-01**	**1.10E-02**
	Idling (g/vehicle/day)	2020 - Baseline	1.12E-01	1.07E-01	2.64E+01	2.01E+00
		2021 - Baseline	8.24E-02	7.89E-02	2.58E+01	1.95E+00
		2022 - Baseline	7.03E-02	6.73E-02	2.55E+01	1.93E+00
		2023 - Baseline	1.18E-02	1.13E-02	2.24E+01	1.81E+00
		2024 - Baseline	9.46E-03	9.05E-03	2.03E+01	1.81E+00
		Average - Baseline	**5.72E-02**	**5.47E-02**	**2.41E+01**	**1.90E+00**
		2027 - Project	**6.26E-03**	**5.98E-03**	**1.30E+01**	**1.86E+00**

1. Transfer/Customer truck emission factors for running per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW. Baseline emission factors are averaged across the Baseline Period (2020-2024). Project emission factors are from 2027.

2. Transfer/Customer truck emission factors for truck idling per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for IDLEX. Baseline emission factors are averaged across the Baseline Period (2020-2024). Project emission factors are from 2027.

3. Adjustment factors per Appendix A - EMFAC2021 Adjustment Factors (October 2025) for T7 Single Dump Class 8. No Adjustment Factors were required for 2020-2021.

4. Adjusted Emission Factors = Non-Adjusted Emission Factors * Adjustment Factors.

CEQA AIR QUALITY AND HEALTH RISK ASSESSMENT RESULTS MEMORANDUM

Pier 92 Modernization and Plant Replacement Project San Francisco, CA

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1. INTRODUCTION

As required by the San Francisco Planning Department's Environmental Planning (EP) division, Trinity Consultants, Inc. (Trinity) prepared a California Environmental Quality Act (CEQA) air quality analysis of the criteria air pollutant emissions and health risks associated with the construction and operational phases of Martin Marietta Northern California Aggregates, LLC's (Martin Marietta's) Pier 92 Modernization and Plant Replacement Project (the Project or Proposed Project). This Air Quality (AQ) and Health Risk Assessment (HRA) Results Memorandum (the Results Memorandum) documents the results of this analysis. This analysis was prepared pursuant to the AQ and HRA Methodology approved by EP (see **Appendix A**), with revisions (if any) noted in **Section 2**.

1.1 Project Description

Martin Marietta currently operates a sand processing facility at Pier 92 in San Francisco, California (Pier 92 or the Facility) within the jurisdiction of the Bay Area Air District (Air District). The Facility is leased from the Port of San Francisco and occupies an area of approximately 190,229 square feet (4.37 acres).

The Facility receives marine sand via barge from the Islais Creek Channel along the northern boundary. The sand is transferred from barges to the raw material stockpile via conveyor and radial stacker. Sand is then transferred via front-end loader to the wash plant. The sand is screened and washed in the wash plant. Oversized sand is transferred to the oversized stockpile. The remaining sand is washed, dewatered, and transferred to the product stockpile. Sand from the product stockpile is transferred via front-end loader to customer trucks for delivery off-site. Before the trucks leave the Facility boundary, they are subject to wheel wash and track out control. The sand is used to build public and private projects and infrastructure throughout San Francisco and the greater San Francisco Bay Area.

The Project would involve continued operation of the Facility under the same plant classification and uses while implementing additional control measures to reduce air emissions. The lease parcel would physically expand by approximately 34,371 square feet (0.79 acres), increasing the total site size to 224,600 square feet (5.16 acres). The Project would include a short construction phase for the additional control measures and reconfiguration of equipment, and an operational phase. The construction phase would include excavation, grading, installation of new equipment, construction of new warehouse, and paving. Existing operations would occur during the construction phase.

The operational improvements include paving of the main customer truck and loader pathways within the Facility, enclosure of the wash plant screens and conveyors, construction of a partial enclosure for the product sand pile, and the addition of improved controls, including a wheel wash, truck bed water spray, and a modern stormwater management system.

2. METHODOLOGY

Trinity evaluated the potential air quality and health risk impacts associated with the construction and operation of the Project. The analysis was conducted in accordance with the standards, guidelines, procedures, and methodologies established in EP's Air Quality Guidelines and Greenhouse Gas Analysis Guidelines, the Air District's CEQA Guidelines, and the California Natural Resources Agency's CEQA Guidelines. The evaluation utilized guidance and methodologies from the California Air Resources Board (CARB), the California Office of Environmental Health Hazard Assessment (OEHHA), and the United States Environmental Protection Agency (EPA).

The Project is a source of criteria pollutant emissions, including particulate matter with an aerodynamic diameter of less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$), nitrogen oxides (NO_X), and reactive organic gases (ROG), and toxic air contaminants (TACs).

Criteria pollutants and TAC emissions were evaluated for the construction and operational phase of the Project during the Baseline Period (2020-2024) and after the Project. The sources evaluated and the specific emissions calculation methodologies are outlined in the AQ and HRA Methodology, approved by EP (included as **Appendix A**).

Any revisions to, and additional information not previously mentioned in the AQ and HRA Methodology, are outlined below as discussed with and approved by EP.

2.1 Methodology Revisions

There were no revisions to the AQ and HRA Methodology document approved by EP in **Appendix A** of this document.

3. EMISSIONS ANALYSIS RESULTS

Construction emissions were evaluated for road pavement, excavation, grading, off-road construction equipment use, on-road worker vehicle use, on-road equipment delivery vehicles, on-road asphalt delivery trucks, on-road base underlay delivery trucks, and on-road soil haul trucks involved in the construction process. **Table 3-1** and **Table 3-2** summarize the annual and daily criteria pollutant emissions during the construction phase. Operations will continue during construction; however, construction will constrain Baseline operations such that production will not exceed Baseline throughputs.. **Table 3-3** summarizes the TACs emitted during the construction phase. Detailed emission calculations for each construction source are outlined in **Appendix B.**

Operational emissions were evaluated for the Baseline Period and the Project from material transfer, stockpiles, barges and tugboats, fugitive road dust (on-site and off-site), off-road equipment, and on-road vehicles. **Table 3-4** and **Table 3-5** summarize the annual and daily criteria pollutant potential to emit (PTE) during the operational phase. **Table 3-6** and **Table 3-7** summarize the TAC PTE from the Baseline Period, Project, and the change in emissions. Detailed emission calculations for each operational source are outlined in **Appendix B.**

Table 3-1. Construction Criteria Pollutant - Annual PTE Summary

Sources	Maximum Annual Emissions (tpy)			
	PM_{10}	$PM_{2.5}$	NO_X	ROG
Paving	N/A	N/A	N/A	1.90E-03
Excavation	3.01E-02	1.66E-02	N/A	N/A
Grading	7.95E-04	8.59E-05	N/A	N/A
Off-Road Equipment	2.13E-03	2.02E-03	3.06E-01	1.61E-02
On-Road Vehicles	1.63E-03	6.77E-04	1.28E-02	6.34E-04
Fugitive Road Dust	1.63E-03	4.01E-04	N/A	N/A
Total Construction Emissions	**3.47E-02**	**1.93E-02**	**3.18E-01**	**1.86E-02**

Table 3-2. Construction Criteria Pollutant - Daily PTE Summary

Sources	Average Daily Emissions (lb/day)			
	PM_{10}	$PM_{2.5}$	NO_X	ROG
Paving	N/A	N/A	N/A	2.72E-02
Excavation	4.30E-01	2.36E-01	N/A	N/A
Grading	1.14E-02	1.23E-03	N/A	N/A
Off-Road Equipment	3.04E-02	2.89E-02	4.36E+00	2.30E-01
On-Road Vehicles	2.32E-02	9.68E-03	1.83E-01	9.06E-03
Fugitive Road Dust	2.33E-02	5.73E-03	N/A	N/A
Total Construction Emissions	**4.95E-01**	**2.76E-01**	**4.55E+00**	**2.66E-01**

Table 3-3. Construction TAC PTE Summary

Sources	Maximum Annual Emissions (lb/yr)
	Diesel Particulate Matter
Paving	N/A
Excavation	N/A
Grading	N/A
Off-Road Equipment	4.26E+00
On-Road Vehicles	8.13E-07
Fugitive Road Dust	N/A
Total Construction Emissions	**4.26E+00**

Table 3-4. Operation Criteria Pollutant - Annual PTE Summary

Scenario	Sources	Maximum Annual Emissions (tpy)			
		PM_{10}	$PM_{2.5}$	NO_X	ROG
Baseline	Material Transfer	0.276	0.041	N/A	N/A
	Stockpiles	0.040	0.006	N/A	N/A
	Fugitive Road Dust	0.926	0.190	N/A	N/A
	Barge Trips	0.102	0.102	8.515	0.348
	Off-Road Equipment	0.036	0.033	0.877	0.096
	On-Road Vehicles	0.010	0.005	0.157	0.005
	Total Baseline Emissions	**1.390**	**0.377**	**9.549**	**0.449**
Project	Material Transfer	0.634	0.095	N/A	N/A
	Stockpiles	0.045	0.007	N/A	N/A
	Fugitive Road Dust	0.957	0.231	N/A	N/A
	Barge Trips	0.148	0.148	12.696	0.566
	Off-Road Equipment	0.046	0.042	1.145	0.178
	On-Road Vehicles	0.021	0.008	0.149	0.003
	Total Project Emissions	**1.850**	**0.531**	**13.989**	**0.746**
Change in Emissions	Material Transfer	0.357	0.054	N/A	N/A
	Stockpiles	0.006	0.001	N/A	N/A
	Fugitive Road Dust	0.030	0.042	N/A	N/A
	Barge Trips	0.045	0.045	4.181	0.217
	Off-Road Equipment	0.010	0.009	0.268	0.082
	On-Road Vehicles[1]	0.011	0.003	-0.009	-0.002
Total Change in Emissions		**0.46**	**0.15**	**4.44**	**0.30**

1. The change in On-Road Vehicle NOx and ROG emissions is negative due to the emission factors for the Project Scenario (Year 2027) drastically decreasing as compared to the emission factor used in the Baseline Scenario (average of 2020-2024), despite an increase in truck trips. The emission factor decreases are attributed to assumptions that statewide, vehicle owners will retire older, higher-emitting vehicles with cleaner, as more efficient technology becomes more readily available.

Table 3-5. Operation Criteria Pollutant - Daily PTE Summary

Scenario	Sources	Average Daily Emissions (lb/day)			
		PM_{10}	$PM_{2.5}$	NO_X	ROG
Baseline	Material Transfer	1.515	0.227	N/A	N/A
	Stockpiles	0.216	0.032	N/A	N/A
	Fugitive Road Dust	5.076	1.039	N/A	N/A
	Barge Trips	0.561	0.561	46.656	1.909
	Off-Road Equipment	0.197	0.182	4.806	0.524
	On-Road Vehicles	0.053	0.027	0.863	0.026
	Total Baseline Emissions	**7.619**	**2.068**	**52.325**	**2.458**
Project	Material Transfer	3.472	0.521	N/A	N/A
	Stockpiles	0.247	0.037	N/A	N/A
	Fugitive Road Dust	5.242	1.267	N/A	N/A
	Barge Trips	0.810	0.810	69.565	3.099
	Off-Road Equipment	0.253	0.231	6.276	0.973
	On-Road Vehicles	0.114	0.043	0.814	0.014
	Total Project Emissions	**10.138**	**2.909**	**76.655**	**4.087**
Change in Emissions	Material Transfer	1.957	0.294	N/A	N/A
	Stockpiles	0.030	0.005	N/A	N/A
	Fugitive Road Dust	0.165	0.228	N/A	N/A
	Barge Trips	0.249	0.249	22.909	1.190
	Off-Road Equipment	0.056	0.050	1.470	0.450
	On-Road Vehicles[1]	0.061	0.016	-0.049	-0.012
Total Change in Emissions		**2.52**	**0.84**	**24.33**	**1.63**

1. The change in On-Road Vehicle NOx and ROG emissions is negative due to the emission factors for the Project Scenario (Year 2027) drastically decreasing as compared to the emission factor used in the Baseline Scenario (average of 2020-2024), despite an increase in truck trips. The emission factor decreases are attributed to assumptions that statewide, vehicle owners will retire older, higher-emitting vehicles with cleaner, as more efficient technology becomes more readily available.

Table 3-6. Operation TAC PTE Summary

Scenario	Sources	Maximum Annual Emissions (lb/yr)		
		Respirable Crystalline Silica [1]	Diesel Particulate Matter	Heavy Metals
Baseline	Material Transfer	57.00	N/A	N/A
	Stockpiles	8.14	N/A	N/A
	Fugitive Road Dust	477.44	N/A	See Table 3-7
	Barge Trips	N/A	204.72	N/A
	Off-Road Equipment	N/A	71.97	N/A
	On-Road Vehicles	N/A	19.25	N/A
	Total Baseline Emissions	**542.58**	**295.95**	**See Table 3-7**
Project	Material Transfer	130.63	N/A	N/A
	Stockpiles	9.28	N/A	N/A
	Fugitive Road Dust	442.37	N/A	See Table 3-7
	Barge Trips	N/A	295.70	N/A
	Off-Road Equipment	N/A	92.39	N/A
	On-Road Vehicles	N/A	41.60	N/A
	Total Project Emissions	**582.27**	**429.69**	**See Table 3-7**
Change in Emissions	Material Transfer	73.63	N/A	N/A
	Stockpiles	1.14	N/A	N/A
	Fugitive Road Dust	-35.08	N/A	See Table 3-7
	Barge Trips	N/A	90.98	N/A
	Off-Road Equipment	N/A	20.41	N/A
	On-Road Vehicles	N/A	22.35	N/A
Total Change in Emissions		**39.69**	**133.74**	**See Table 3-7**

1. Change in respirable crystalline silica emissions is negative due to paving and controls improvements during the Project.

Table 3-7. Operation TAC PTE Summary – Fugitive Road Dust

Pollutants	Maximum Annual Emissions (lb/yr)		
	Baseline	Project	Change in Emissions [1]
Hexavalent chromium	2.72E-04	2.57E-04	-1.50E-05
Mercury	1.74E-05	1.75E-05	1.55E-07
Arsenic	1.57E-02	1.42E-02	-1.49E-03
Beryllium	1.69E-04	1.45E-04	-2.32E-05
Cadmium	7.00E-05	6.48E-05	-5.14E-06
Cobalt	1.15E-02	1.05E-02	-9.54E-04
Copper	1.02E-02	9.19E-03	-9.98E-04
Lead	6.43E-03	5.98E-03	-4.48E-04
Nickel	7.53E-02	6.92E-02	-6.16E-03
Selenium	1.84E-04	1.70E-04	-1.35E-05
Vanadium	5.08E-02	4.65E-02	-4.36E-03
Crystalline Silica	4.77E+02	4.42E+02	-3.51E+01
Benzene	8.49E-04	7.37E-04	-1.12E-04
Toluene	8.49E-04	7.37E-04	-1.12E-04
Ethylbenzene	8.49E-04	7.37E-04	-1.12E-04
Xylenes	8.49E-04	7.37E-04	-1.12E-04
Naphthalene	3.64E-02	3.14E-02	-4.99E-03

1. Change in emissions is negative due to paving and controls improvements during the Project.

4. HEALTH RISK ASSESSMENT RESULTS

An HRA was conducted to evaluate the Project's local risks and hazards. The HRA evaluated the cancer risk, chronic hazard index, acute hazard index, and annual average $PM_{2.5}$ concentration impact associated with the Project's construction and operational phases. The AQ and HRA Methodology, provided in **Appendix A** outline the methodology for this HRA.

The following subsections summarize the air dispersion models, including layouts of modeled sources, HRA results for the project, net project results, and cumulative analysis.

4.1 Air Dispersion Models

As outlined in the AQ and HRA Methodology, the latest version of each software available at the time of modeling was used. AERMOD version 24142 was used with Trinity's *BREEZE™ AERMOD Suite* software Version 13.1 to calculate the ambient air concentration at the specified receptor locations and heights. The following six (6) modeling scenarios were run:

- Construction phase HRA model
- Construction phase annual average $PM_{2.5}$ model
- Baseline Period operation phase HRA model
- Baseline Period operation phase annual average $PM_{2.5}$ model
- Project operation phase HRA model
- Project operation phase annual average $PM_{2.5}$ model

AERMOD modeling input parameters are provided in **Appendix C.** The land use category was determined to be urban using AERSURFACE; thus, an urban population of 827,526 was used. The emission source layout for each modeling scenario is outlined in **Figures 4-1 through 4-4**.

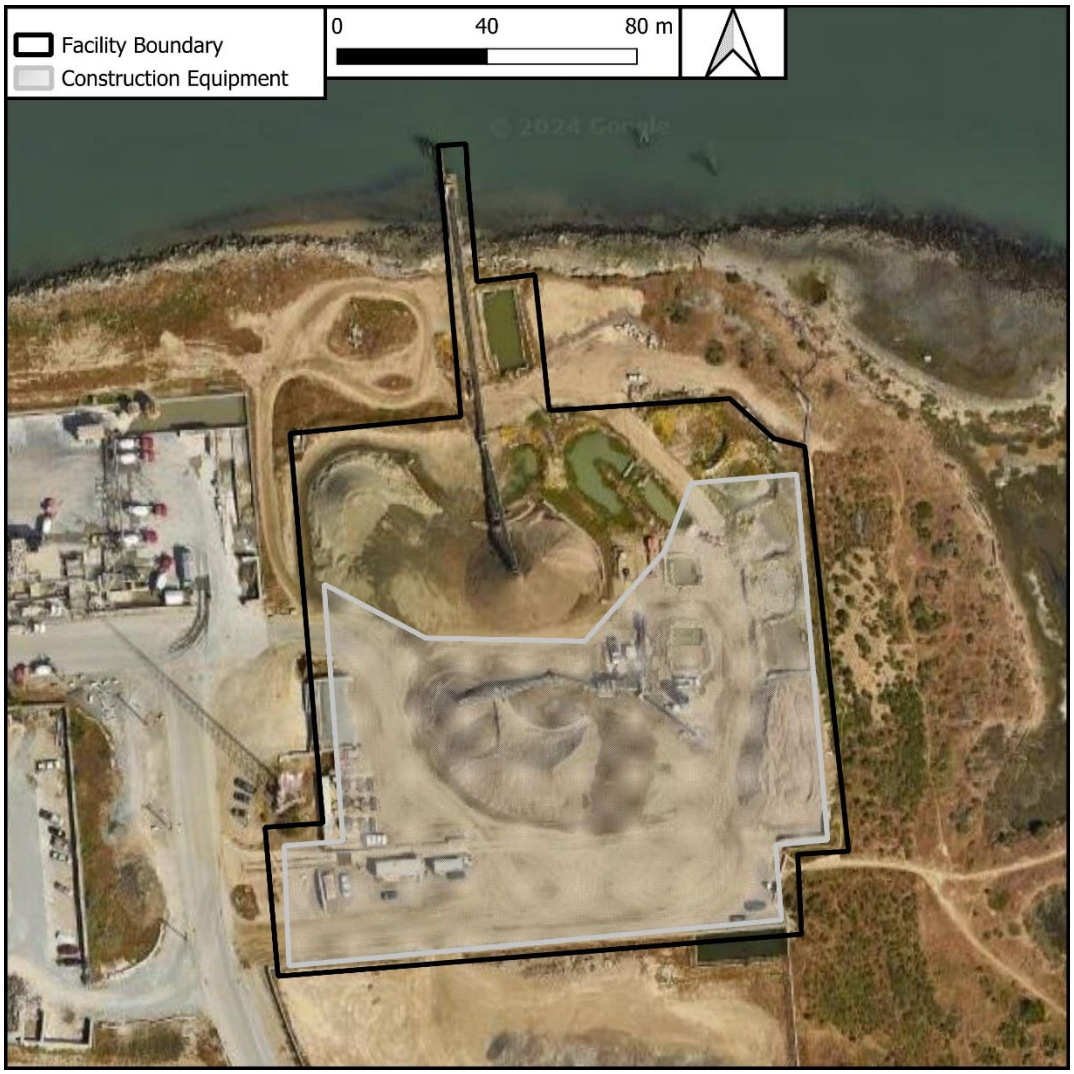


Figure 4-1. Layout of Modeled Emission Sources for the Construction Phase

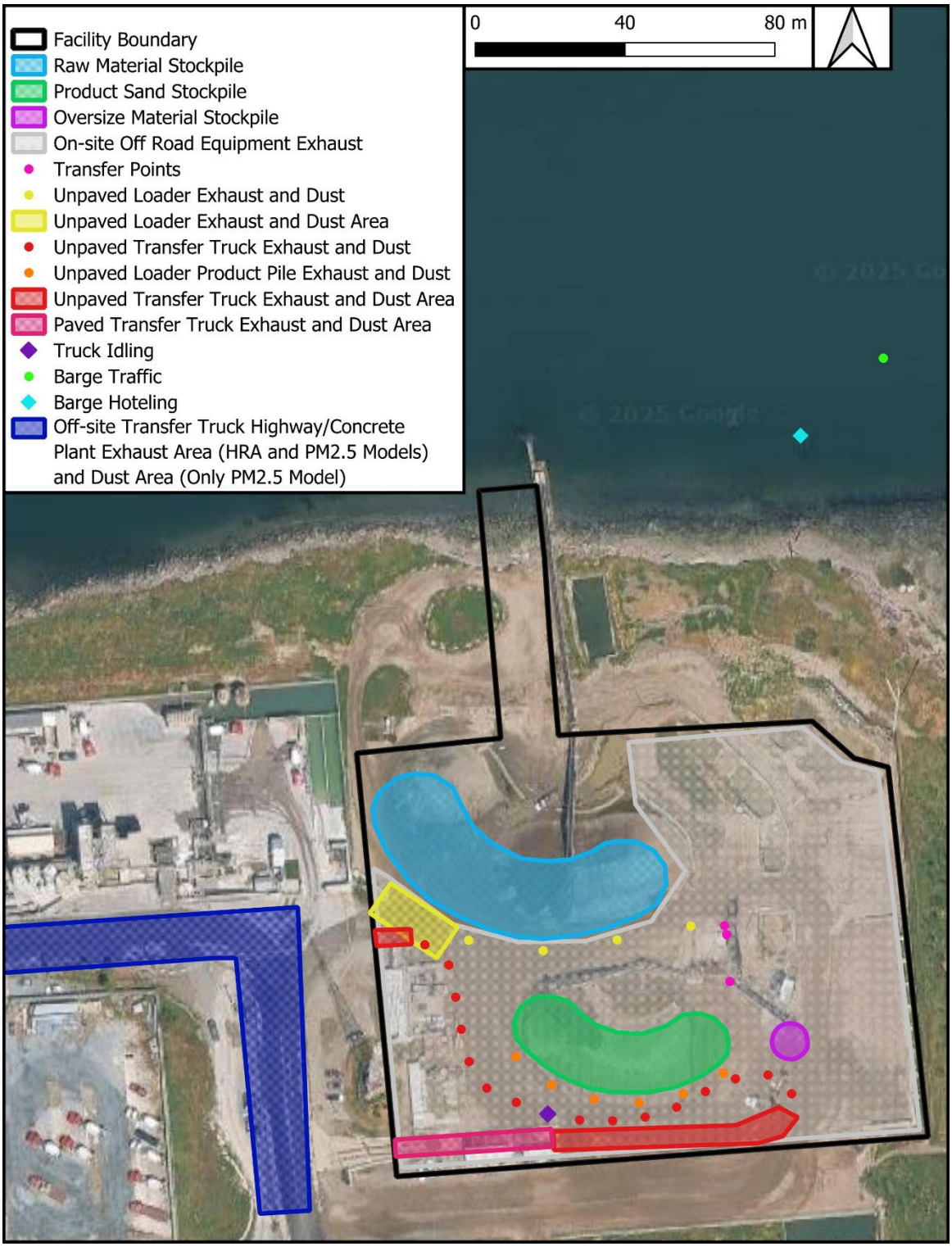


Figure 4-2. Layout of Modeled Emission Sources for the Baseline Period Operation Phase

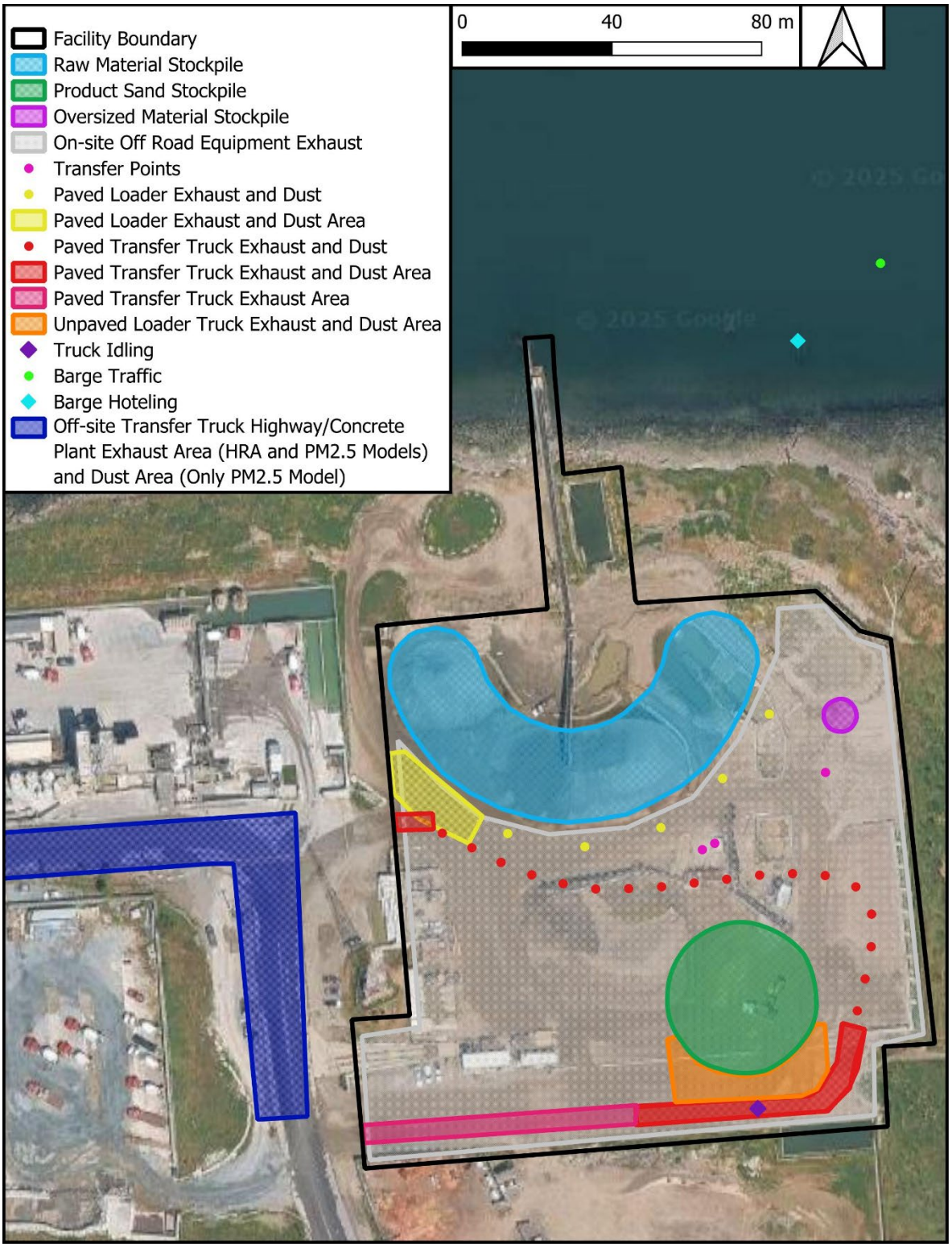


Figure 4-3. Layout of Modeled Emission Sources for the Project Operation Phase

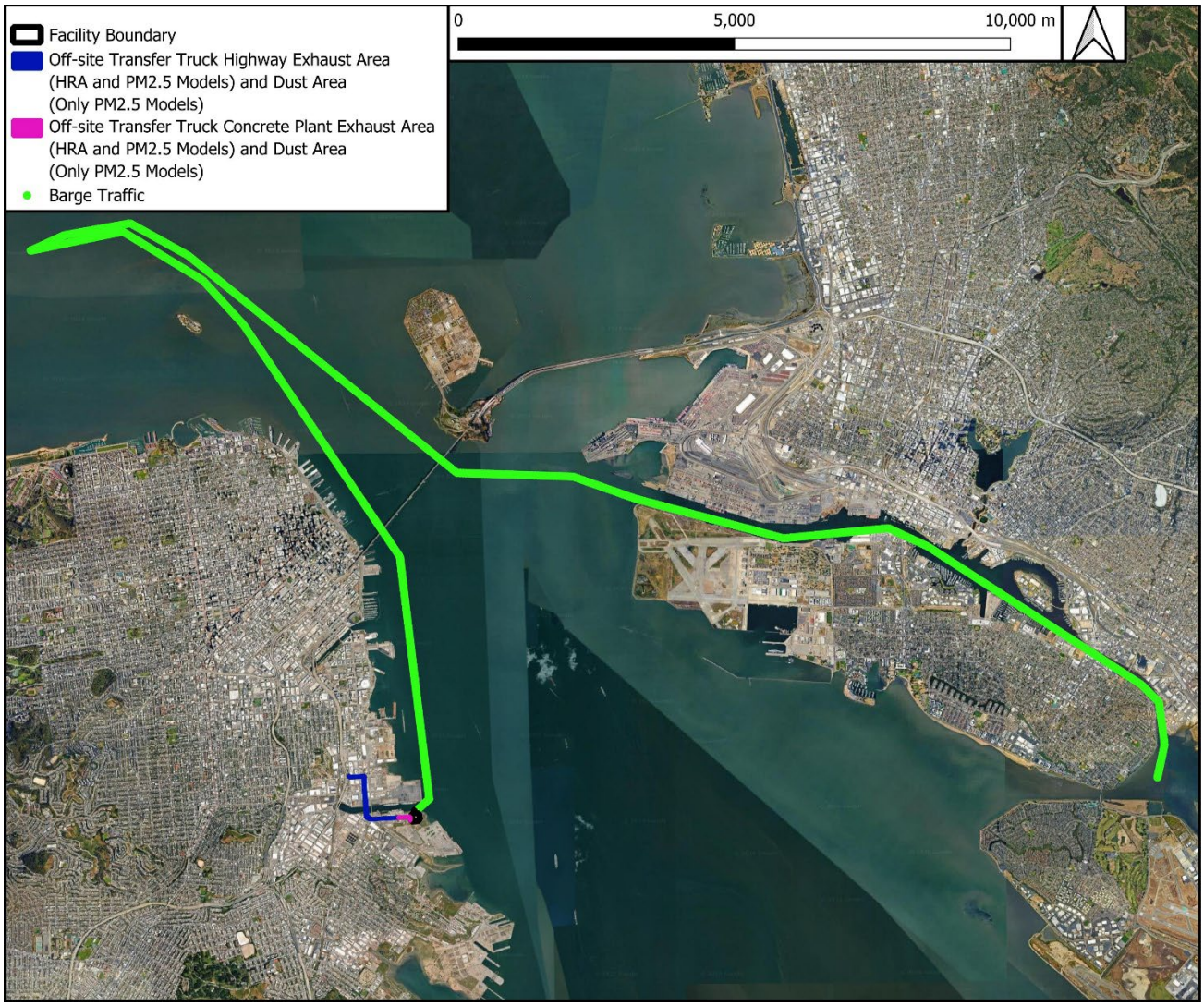


Figure 4-4. Layout of Modeled Off-Site Emission Sources

4.2 Health Risk Assessment Results

The Project's local risks and hazards, including cancer risk, chronic hazard index, acute hazard index, and annual average $PM_{2.5}$ concentration impact were evaluated. The following three key receptor types were evaluated for each modeling scenario discussed above:

- Maximally Exposed Individual Worker (MEIW)
- Maximally Exposed Individual Resident (MEIR)
- Sensitive receptors
  - Healthcare Patients
  - Daycare Children

Table 4-1 details the cancer risk, chronic hazard index, acute hazard index, and annual average $PM_{2.5}$ concentration impact for each key receptor during the construction, Baseline Period, and Project scenarios. Only operational acute hazard indices were considered as the Project's construction phase is not anticipated to include TACs with acute health impacts.

Table 4-1. Construction, Project, and Baseline Local Risks and Hazards

Scenario	Receptor Type[a,b,c]	UTM Easting (m)	UTM Northing (m)	Maximum Cancer Risk (per million)	Maximum Chronic HI	Maximum Acute HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Construction	MEIW	554740	4177860	0.0039	0.0002		0.00883
	MEIR 1	554440	4176900	0.0027	4.88E-06		0.00021
	MEIR 2	554380	4176940	-	-		0.00021
	Healthcare Patient – Facility 1	554340/ 554320	4177120/ 4177140	-	5.87E-06		0.00026
	Healthcare Patient – Facility 2	553960	4177740	0.0046	-		0.00023
	Daycare Children	553920	4177120	0.0030	3.44E-06		0.00015
Construction Worker Trips[d]				0.02			0.0005
Project Operations	MEIW	554740	4177860	6.91	0.071	0.0066	0.225
	MEIR 1	554440	4176900	0.805	0.0018	-	0.0050
	MEIR 2	554380	4176940	-	-	0.0006	0.0048
	Healthcare Patient – Facility 1	554340/ 554320	4177120/ 4177140	-	0.0025	0.0005	0.0070
	Healthcare Patient – Facility 2	553960	4177740	1.780	-	-	0.0077
	Daycare Children	553920	4177120	0.601	0.0015	0.0004	0.0044
Baseline	MEIW	554740	4177860	8.741	0.0879	0.011	0.193
	MEIR 1	554440	4176900	0.805	0.0020	-	0.00401
	MEIR 2	554380	4176940	-	-	0.001	0.00383
	Healthcare Patient – Facility 1	554340/ 554320	4177120/ 4177140	-	0.0028	0.0011	0.0057
	Healthcare Patient – Facility 2	553960	4177740	2.202	-	-	0.0058
	Daycare Children	553920	4177120	0.804	0.0017	0.0012	0.0035

a. The MEIW receptor is the highest impacted receptor which best aligns with a workplace. The MEIW receptor was chosen to be the closest building at Central Concrete Supply to the Facility.
b. The MEIR is the highest impacted receptor which best aligns with a residence. The residence with the maximum cancer risk and chronic HI is different from the residence with the maximum acute HI. Therefore, two MEIRs are listed.
c. Center for Youth Wellness facility located at 3450 3rd St, San Francisco, CA 94124, is Healthcare Patient- Facility 2 and has the maximum cancer risk. Bayview Child Health Center, located at 1337 Evans Ave, San Francisco, CA 94124, is Healthcare Patient - Facility 1 and has the maximum chronic HI.
d. Construction Worker Trip cancer risk and $PM_{2.5}$ concentration was conservatively calculated using EP's Air Quality Guidelines Appendix C linear regression methodology.

The following figures included in **Appendix D** depict the local risks and hazards over the receptor grid area for the baseline period and project operation phase:

- **Figure D-1**: Baseline Worker Cancer Risk
- **Figure D-2**: Baseline Resident Cancer Risk
- **Figure D-3**: Baseline Healthcare Patient Cancer Risk
- **Figure D-4**: Baseline Acute Hazard Index
- **Figure D-5**: Baseline Annual Average $PM_{2.5}$ Concentration
- **Figure D-6**: Project Worker Cancer Risk
- **Figure D-7**: Project Resident Cancer Risk
- **Figure D-8**: Project Healthcare Patient Cancer Risk
- **Figure D-9**: Project Acute Hazard Index
- **Figure D-10**: Project Annual Average $PM_{2.5}$ Concentration

4.3 Net Project Risk Assessment Results

The net Project health risk impact was evaluated by summing the construction phase and Project operation phase health risk impacts, as the Facility will continue to operate during construction, and subtracting the Baseline Period health risk impacts. **Table 4-2** summarizes the net Project local risks and hazards. A detailed results table is provided in **Appendix E**.

Table 4-2. Net Project Local Risks and Hazards

Receptor Type[a,b]	UTM Easting (m)	UTM Northing (m)	Maximum Cancer Risk (per million)	Maximum Chronic HI	Maximum Acute HI	$PM_{2.5}$ Concentration ($\mu g/m^3$)
MEIW	554740	4177860	-1.807	-0.016	-0.004	**0.041**
MEIR 1	554440	4176900	**0.023**	-0.0002	-	0.002
MEIR 2	554380	4176940	-	-	-0.0003	0.002
Healthcare Patient – Facility 1	554340/ 554320	4177120/ 4177140	-	-0.0003	-0.0006	0.002
Healthcare Patient – Facility 2	553960	4177740	-0.398	-	-	0.003
Daycare Children	553920	4177120	-0.180	-0.00016	-0.00035	0.002

a. The residence with the maximum cancer risk and chronic HI is different from the residence with the maximum acute HI; therefore, two MEIRs are listed.
b. The healthcare patient facility with the maximum cancer risk is different from the healthcare patient facility with the maximum acute HI; therefore, two Healthcare Patient Facilities are listed.
c. Maximum impacts are shown in bold. Negative results indicate no impact.

The net Project cancer risk is negative for the MEIW, healthcare patient, and daycare children receptor types, as the cancer risk associated with the Baseline Period is greater than the summed construction phase and Project operation phase cancer risks. The negative net Project cancer risk results is a direct outcome from applying different Worker Adjustment Factors (WAF) between the Baseline and Project scenarios. A WAF is needed when the modeled emission sources do not operate continuously. For the Project, a majority of the highest emitting sources will only emit during the Project's operating hours, such as the off-road equipment and fugitive dust. In AERMOD, all sources are modeled assuming a continuous emission rate over 8,760 hours per year to determine the annual average concentration over the receptor grid. The annual average concentrations are then multiplied in HARP with the source's annual and hourly emission rates, which the annual emission rate reflects the intermittent operating nature. The product of these two

will thus include the average concentration with hours where zero emissions occurred. However, applying this annual average concentration to workers, healthcare patients, and daycare children would then underestimate their exposure, which no hours of their exposure include zero emissions. To counteract this, a WAF is applied to correct for the impacts these receptors are coincidentally exposed to. As discussed in the AQ and HRA Methodology, the Baseline Period operating schedule is 9 hours per day and 5 days per week, which resulted in a WAF of 3.7. The Project operation phase projected operating schedule required to process the daily throughput limit is 12 hours per day and 5 days per week, which resulted in a WAF of 2.8. So, while the post-Project emissions have a net increase, the impact of applying a higher WAF to the Baseline than for the Project outweighs the health risk impacts from the emission rate increase.

Additionally, the Project is only able to achieve the emission rate increase due to the increase in daily operating hours (i.e., there is no change in the process equipment's maximum rated capacities). If market conditions dictate that less throughput is needed, the Project's actual emissions and operating hours would also decrease and the applicable WAF would increase. However, if the Project's operating schedule were to match the Baseline's to have identical WAFs, then the Project's actual emissions and Baseline emissions would also be nearly identical. If there were differences, the Project's actual emissions would be less than the Baseline due to the Project's improvements of paving the onsite roads and reducing fugitive dust emissions. Therefore, the net cancer risk for MEIW, healthcare patient, and daycare children receptors could range from near zero to the negative values represented for each receptor type in Table 4-2.

The net Project chronic and acute risk are negative for all receptor types. The chronic impacts are primarily driven by arsenic and crystalline silica emissions while acute impacts are primarily driven by nickel emissions. These heavy metals are only found from the onsite fugitive dust. Because the Project will pave the roadways and thereby reduce fugitive road dust emissions, these heavy metal emissions will also decrease post-Project. The reduction of heavy metal emissions therefore results in a net decrease of chronic and acute hazard indices.

4.4 Cumulative Analysis

Cumulative health risks are evaluated at the maximum impacted receptors and consider the effects of cumulative projects within 1,000 feet of those receptors. As shown in **Table 4-2** above, the maximally impacted receptors are the MEIW and the MEIR 1, for $PM_{2.5}$ concentration ($\mu g/m^3$) and maximum cancer risk (per million), respectively. **Table 4-2** also shows that the net Project impacts for maximum chronic HI and maximum acute HI are negative. Therefore, the project has no potential to contribute to cumulative chronic or acute HI impacts, and these impacts are not discussed further.

Cumulative impacts at the MEIW and MEIR 1 related to cancer risk and $PM_{2.5}$ concentration were evaluated quantitatively by summing net impacts from the Project's operation and construction phases and existing modeled emissions from the Citywide HRA. These are summarized in **Table 4-3**.

Table 4-3. Cumulative Analysis Local Risks and Hazards

Scenario	Receptor Type	UTM Easting (m)	UTM Northing (m)	Maximum Cancer Risk (per million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
Net Project	MEIW	554740	4177860	-1.807	0.041
	MEIR 1	554440	4176900	0.023	0.002
Citywide HRA	MEIW	554740	4177860	32.48	7.912

Scenario	Receptor Type	UTM Easting (m)	UTM Northing (m)	Maximum Cancer Risk (per million)	$PM_{2.5}$ Concentration ($\mu g/m^3$)
	MEIR 1	554440	4176900	42.32	8.365
Cumulative	MEIW	554740	4177860	30.68	7.953
	MEIR 1	554440	4176900	42.35	8.367

The cumulative totals (net Project plus existing Citywide HRA-modeled conditions) show that total cancer risk (per million) and PM2.5 concentrations ($\mu g/m^3$) do not exceed the City's Air Pollutant Exposure Zone (APEZ) criteria of 90 per million and 9 $\mu g/m^3$, respectively, at the locations of the MEIW and MEIR 1.

Present and foreseeable projects within 1000 feet of the MEIW and MEIR are listed in **Table 4-4** and depicted in **Figure 4-5.** Since quantitative information was not available for these projects at the time of analysis, their impacts in combination with the Project's impacts are discussed qualitatively below.

Table 4-4. Present and Foreseeable Projects List and Timeline[a]

Project Name	Anticipated Construction/Implementation Dates	Approximate Distance from MEIW or MEIR 1
Pier 94 Grassland Meadow Enhancements	Ongoing, 2 years total	545 feet (east of MEIW)
Amador Street Infrastructure	August 2025 – December 2026	145 feet (southwest of MEIW)
Pier 80 Subsidence Repairs	August 2025 – August 2026	775 feet (north of MEIW)
CEMEX Construction Materials Pacific (Pier 92)	Unknown – Permit application under evaluation	625 feet (west of MEIW)
200 Acacia Avenue	Unknown – Project on hold	430 feet (southeast of MEIR 1)
300 Catalina Street	Unknown – Project on hold	640 feet (southeast of MEIR 1)

a. Information provided by EP.

Cumulative Health Risk Impacts at the MEIW

There are four projects within 1000 feet of the MEIW, which are discussed below.

Pier 94 Grassland Meadow Enhancements. The Pier 94 Grassland Meadow Enhancements project involves the removal of invasive nonnative plants from 3 acres of uplands adjacent to the Pier 94 Wetlands and the planting of 500 native plants. The enhancements will create 2 acres of a biologically diverse native grasslands meadow habitat. The enhancement project is currently ongoing and will span two years total. It does not include excavation or grading activities or the removal of any trees. The enhancement project will not have any air quality impacts and will not contribute to the Project's cumulative health risk impact.

Amador Street Infrastructure. The Amador Street Infrastructure project involves the reconstruction of about 1,800 feet of Amador Street and underground utilities. The infrastructure project does not result in operational emissions and construction of this project will not overlap with the Project, therefore, the Amador Street Infrastructure Project will not contribute to the Project's cumulative health risk impact.

Pier 80 Subsidence Repairs. The Pier 80 Subsidence Repair project aims to improve the southeast corner of Pier 80 by raising the grade and improving the storm water utilities to remediate flooding issues. Repair operations will include extending catch basins, installing duck bill valves, and adding asphalt concrete pavement. The repair project is approximately 775 feet from the MEIW and will not result in any operational emissions. Construction emission concentrations from the Pier 80 Subsidence Repair project would decrease

substantially with increasing distance from the source; thus, any cumulative contribution of construction emissions from this project would be minimal at the MEIW. Therefore, the Pier 80 Subsidence Repair project, in combination with the Project, could result in a minimal increase in cumulative health risk impacts.

CEMEX Construction Materials Pacific. The CEMEX Construction Materials Pacific project would modify CEMEX's permitted limit of sand and aggregate imported to the site by barge. CEMEX is currently permitted to import 389,375 tpy of aggregate by truck, 389,375 tpy of sand by truck, and 60,000 tpy sand by barge. CEMEX is proposing to modify their permit to increase the amount of material that may be imported by barge, specifically to 235,572 tpy of sand by barge and 153,803 tpy of aggregate by barge. There would be no change to CEMEX's permitted production limit. This project would allow CEMEX flexibility to bring in more material by barge, which would thereby reduce diesel truck trips to the facility. The CEMEX facility is approximately 625 feet from the MEIW. Since the permit application is currently under review by the Air District, the CEMEX project's estimated emissions are not yet available. Therefore, it is not possible to determine whether the CEMEX project, in combination with the Project, would result in a substantial cumulative health risk impact. Regardless, the proposed Project's contribution of 0.041 $\mu g/m^3$ to the $PM_{2.5}$ concentration at the MEIW would be minimal, and the Project would make no contribution to the MEIW cancer risk (per million).

Cumulative Health Risk Impacts at the MEIR 1

There are two projects within 1,000 feet of MEIR 1, which are discussed below.

200 Acacia Avenue. The 200 Acacia Avenue project would construct seven buildings with a total of 34 residential units as part of a larger development project (HOPE SF). Construction and operational dates are currently unknown as the 200 Acacia Avenue project is on hold. Regardless, the Project's contribution of 0.023 per million to cancer risk at MEIR 1 would be minimal, and the Project would make minimal contribution to the MEIR $PM_{2.5}$ concentration ($\mu g/m^3$).

300 Catalina Street. The 300 Catalina Street project would construct four buildings with a total of 30 residential units as part of a larger development project (HOPE SF). Construction and operational dates are currently unknown as the 300 Catalina Street project is on hold. Regardless, the Project's contribution of 0.023 per million to cancer risk at MEIR 1 would be minimal, and the Project would make minimal contribution to the MEIR $PM_{2.5}$ concentration ($\mu g/m^3$).

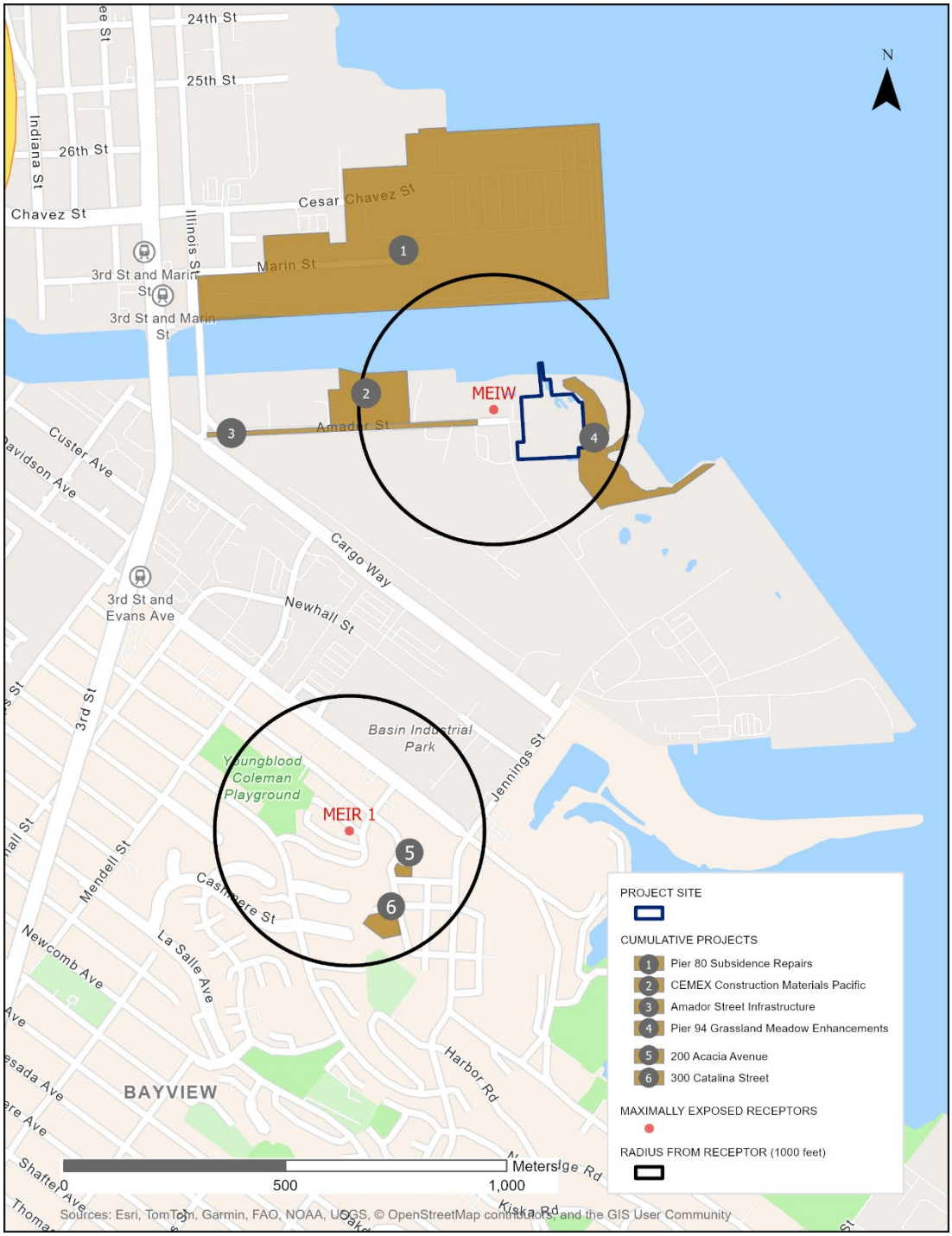


Figure 4-5. Present and Foreseeable Projects Within 1000 feet of MEIW and MEIR 1

APPENDIX A. AQ AND HRA METHODOLOGY

CEQA AIR QUALITY AND HEALTH RISK ASSESSMENT METHODOLOGY

Pier 92 Modernization and Plant Replacement Project San Francisco, CA

Project Sponsor: Martin Marietta Northern California Aggregates, LLC

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January 2026

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1. INTRODUCTION

As required by the San Francisco Planning Department's Environmental Planning (EP) division, Trinity Consultants, Inc. (Trinity) will conduct a California Environmental Quality Act (CEQA) air quality analysis of the criteria air pollutant emissions and health risks associated with the construction and operational phases of Martin Marietta Northern California Aggregates, LLC's (Martin Marietta's) Pier 92 Modernization and Plant Replacement Project (the Project or Proposed Project). This Air Quality (AQ) and Health Risk Assessment (HRA) Methodology Memorandum documents the scope and methods used to perform these analyses. The methodology describes how calculations of the Project criteria air pollutant emissions and toxic air contaminant (TAC) emissions will be performed, and how modeling of resultant health risks from Project construction and operation will occur. The results of the analysis will be used to support EP's CEQA Environmental Impact Report (EIR) and documentation for the Project.

1.1 Existing Facility Operations

Martin Marietta currently operates a sand processing facility at Pier 92 in San Francisco, California (Pier 92 or the Facility) within the jurisdiction of the Bay Area Air District (Air District).

The Facility is leased from the Port of San Francisco and occupies an area of approximately 190,229 square feet (4.37 acres). The majority of the Facility is unpaved, except for a small area leading to the truck scale. The essential operations of the Facility are as follows:

- **Step 1: Marine sand is offloaded and stockpiled.**
  - The Facility receives marine sand via barge from Islais Creek Channel along the northern boundary of the Facility. The sand is transferred from barges to an uncovered raw material stockpile via an unloading conveyor. The sand is saturated with water upon arrival and throughout the unloading process. The unloading conveyor transports the sand southward, where a radial stacker distributes the sand onto the raw material stockpile. The raw material stockpile is maintained in wet condition using a sprinkler system.
- **Step 2: Sand from the raw material stockpile is transferred to the wash plant.**
  - Sand from the raw material stockpile is loaded via front-end loader and transferred to the feed hopper at the wash plant. The loader path is unpaved. The wash plant is located near the southeast corner of the Raw Material Stockpile.
- **Step 3: Sand is screened and washed at the wash plant.**
  - The sand drops from the feed hopper onto a conveyor belt. The conveyor belt transfers the sand into the processing screen. A water spray system is used to control two drop point emissions (hopper to conveyor and conveyor to screen). As the sand moves through screens, water is added to the sand which becomes fully saturated. The screens remove pea gravel, shells, and any oversized sand. The screened oversized material is transferred via a conveyor belt and distributed using a stacker to the uncovered oversized stockpile. The remaining sand is processed further in the wash plant via a twin auger screw and a dewatering screen. The sand exits the dewatering screen at approximately 10% moisture content.
- **Step 4: Product sand is transferred to the product stockpile.**
  - The product sand is transferred to the uncovered product stockpile via conveyor and radial stacker. At this point, the sand is still fully saturated with water. The product pile is periodically wetted via water spray.
- **Step 5: Product sand is transferred to customer trucks.**
  - Customer trucks enter the Facility from Amador Street, through the northern entrance. Martin Marietta does not own nor operate any haul trucks. The customer trucks move throughout the

Facility on an unpaved pathway to be loaded. Sand is transferred from the product sand stockpile to the customer trucks via front-end loader. Afterward, the customer trucks continue on the unpaved path before driving onto a short, paved path before their tires are cleaned via a wheel wash system and track-out control mat. Afterward, the trucks are weighed at the truck scale before leaving the Facility via the southern exit to Amador Street.

The sand is used to build public and private projects and infrastructure throughout San Francisco and the greater San Francisco Bay Area. Under typical conditions, Martin Marietta estimates that about 65% to 75% of the sand produced at the Facility is transported to the two adjacent ready-mix concrete facilities (Central Concrete Supply and CEMEX San Francisco Pier 92).[1] Additionally, EP has determined, for the purpose of environmental review, that the Baseline annual throughput is 349,078 tons/year of sand, which represents an average of the facility's most recent five-year annual throughput from the 2020-2024 operating period.

1.2 Proposed Project Description

The Project will involve continued operation of the Facility under the same plant classification and uses while implementing additional control measures to reduce air emissions. To comply with Air District permitting requirements, the Project will also obtain a Permit to Operate (PTO) from the Air District authorizing a throughput maximum of up to 800,000 tons/year of sand. Additional changes to the Facility resulting from the Project are discussed below.

1.2.1 Changes to Lease Parcel

The Project will include a physical expansion of the site by approximately 34,371 square feet (0.79 acres), increasing the total site size to 224,600 square feet (5.16 acres).

1.2.2 Facility Improvements

The Project will include a construction phase (up to 7 months) for the additional control measures and reconfiguration of equipment, and an operational phase.

The proposed improvements include roadway paving of customer truck and loader pathways, construction of a warehouse enclosure for the product sand pile, and the addition of improved controls, including an upgraded wheel wash, truck bed water spray, and a modern stormwater management system. Facility improvements which affect air emissions are described below.

- **Step 1: Marine sand is offloaded and stockpiled.**
  - No substantial changes affecting emissions are proposed as the sand would continue to be saturated with water during offloading and the raw material pile will continue to be wetted by water spray.
- **Step 2: Sand from the raw material stockpile is transferred to the wash plant.**
  - Sand will continue to be transferred from the raw material stockpile to the feed hopper at the wash plant via front-end loader. The front-end loader travel pathway will be paved, resulting in less emissions.
- **Step 3: Sand is screened and washed at the wash plant.**
  - Upgrades to equipment and its control measures are planned for this step: all conveyors at the wash plant and the initial screen will be replaced or retrofitted with covers. The processing screen will be replaced with a fully enclosed screen. The oversized stockpile will move slightly northward from the

[1] Estimates of sand product transported to the two adjacent concrete-ready-mix plants per Martin Marietta, based on historical sales.

existing location. Since the sand is saturated with water while being processed at the wash plant, no substantial changes to the emissions will result.

- **Step 4: Product sand is transferred to the product stockpile.**
  - The sand will be transported to the product stockpile via a covered conveyor. The sand will still be fully saturated with water at this point. The product stockpile will now be located in a new partially enclosed warehouse blocking winds from the west and east. The warehouse will be approximately 140' in width, 220' in length and 63' in height. The warehouse will reduce wind erosion emissions from the product stockpile.
- **Step 5: Product sand is transferred to customer trucks.**
  - Customer trucks will continue to enter the site from the same location on Amador Street. The customer truck path will now be entirely paved. Truck loading will occur within the new warehouse. New wheel wash and truck bed water spray systems will be installed and used once the trucks exit the new warehouse for further abatement. Customer trucks will exit to Amador Street, slightly south of the existing exit gate after the truck scale.

To implement the improvements, the following construction activity will occur:

- Disassembly of existing equipment followed by removal of concrete footings for such equipment.
- Excavation will occur as needed to install the improvements and new equipment (including electrical trenches, concrete foundations, and the stormwater system), disturbing approximately 3,305 cubic yards of soil.
- Any excavated soil will be hauled off-site.
- Grading of 1.50 acres of area will occur.
- Paving will occur, affecting approximately 60,000 square feet of area. Areas that will be paved include loader and customer truck pathways. Additionally, 3,330 square feet of area will be paved for employee/visitor parking.

1.3 Objectives and Methodology

Trinity will evaluate the potential air quality and health risk impacts associated with the construction and operation of the Project. The analysis will be conducted in accordance with the standards, guidelines, procedures, and methodologies established in EP's Air Quality Guidelines and Greenhouse Gas Analysis Guidelines (SF Planning Department, 2025), the Air District's CEQA Guidelines (Air District, 2022), and the California Natural Resources Agency's CEQA Guidelines (California Natural Resources Agency, 2019). Additionally, the evaluation will utilize guidance and methodologies from the California Air Resources Board (CARB), the California Office of Environmental Health Hazard Assessment (OEHHA), and the United States Environmental Protection Agency (EPA).

Criteria pollutant and TAC emissions will be evaluated for the construction phase and operational phase (i.e., Project emissions). Additionally, Trinity will evaluate emissions during the Baseline Period (i.e., Baseline emissions) using the operational average during this period.[2] The calculated Project emissions and Baseline emissions will be used to determine the net project increase. Results will be tabulated as demonstrated in **Table 1-1 through Table 1-4**, which are shown as blank here, but will be populated in the separate results memorandum.

[2] The Baseline Period, and resultant average throughputs and trips, will be the based on the most recent 5-year timeframe per EP.

Table 1-1. Operation: Criteria Pollutant Potential to Emit (PTE) Summary

Scenario	Sources	PM_{10}	$PM_{2.5}$	NO_x	ROG
Baseline	Material Transfer			NA	NA
	Stockpiles			NA	NA
	Fugitive Road Dust			NA	NA
	Barge Trips				
	Off-Road Equipment				
	On-Road Vehicles				
	Total Baseline Emissions				
Project	Material Transfer			NA	NA
	Stockpiles			NA	NA
	Fugitive Road Dust			NA	NA
	Barge Trips				
	Off-Road Equipment				
	On-Road Vehicles				
	Total Project Emissions				
Change in Emissions	Material Transfer			NA	NA
	Stockpiles			NA	NA
	Fugitive Road Dust			NA	NA
	Barge Trips				
	Off-Road Equipment				
	On-Road Vehicles				
Total Change in Emissions					

Table 1-2. Operation: TAC PTE Summary

Scenario	Sources	Respirable Crystalline Silica	Diesel Particulate Matter	Heavy Metal 1	Heavy Metal 2	…
Baseline	Material Transfer		NA	NA	NA	NA
	Stockpiles		NA	NA	NA	NA
	Fugitive Road Dust		NA			
	Barge Trips	NA		NA	NA	NA
	Off-Road Equipment	NA		NA	NA	NA
	On-Road Vehicle	NA		NA	NA	NA
	Total Baseline Emissions					
Project	Material Transfer		NA	NA	NA	NA
	Stockpiles		NA	NA	NA	NA
	Fugitive Road Dust		NA			
	Barge Trips	NA		NA	NA	NA
	Off-Road Equipment	NA		NA	NA	NA
	On-Road Vehicle	NA		NA	NA	NA
	Total Project Emissions					
Change in Emissions	Material Transfer		NA	NA	NA	NA
	Stockpiles		NA	NA	NA	NA
	Fugitive Road Dust		NA			
	Barge Trips	NA		NA	NA	NA
	Off-Road Equipment	NA		NA	NA	NA
	On-Road Vehicle	NA		NA	NA	NA
Total Change in Emissions						

Table 1-3. Construction: Criteria Pollutant PTE Summary

Sources	PM_{10}	$PM_{2.5}$	NO_x	ROG
Off-Road Equipment				
On-Road Vehicles				
Paving	NA	NA	NA	
Excavation			NA	NA
Grading			NA	NA
Fugitive Road Dust			NA	NA
Total Construction Emissions				

Table 1-4. Construction: TAC PTE Summary

Sources	Diesel Particulate Matter
Off-Road Equipment	
On-Road Vehicles	
Paving	NA
Excavation	NA
Grading	NA
Total Construction Emissions	

Trinity anticipates that sources of emissions from the Project will include:

- Construction equipment such as cranes, lifts, forklifts, pavers, water trucks, and heavy-duty trucks (construction phase);
- Material transfer points (operational phase);
- Stockpiles (operational phase);
- Fugitive road dust (operational phase);[3]
- Barges and tugboats (operational phase); and
- Mobile sources such as passenger vehicles, loaders, and customer trucks (construction and operational phase).

A detailed description of the methodology to be used in calculating emissions from such sources is described in **Section 2**.

The HRA will be used to evaluate potential incremental health risk impacts (i.e., cancer risk, chronic hazard index, operational acute hazard index,[4] and annual average $PM_{2.5}$ concentration impact). The Project's health risk impacts are determined from potential exposure to TACs and $PM_{2.5}$ associated with the Project's short-term construction and long-term operational phases. Anticipated TACs include crystalline silica and diesel particulate matter (DPM), heavy metals, and certain volatile organic compounds entrained in the road dust. The HRA results will be determined in accordance with EP's Air Quality Guidelines, with additional supporting information based on Air District CEQA Guidelines Appendix E: Recommended Methods for Screening and Modeling Local Risks and Hazards (Appendix E).

A detailed description of the methodology to be used in air dispersion modeling and the HRA from the Project is described in **Section 3** and **Section 4**.

The results of the analysis will be documented in a summary *"Air Quality and HRA Results Memorandum"* that will be presented to EP and ICF and subsequently used to prepare the EIR air quality analysis section.

[3] Fugitive dust from on-site construction will not be quantified per EP's Air Quality and Greenhouse Gas Analysis Guidelines. Fugitive dust from off-site roadway travel will also not be quantified as explained below.

[4] The Project's construction phase is not anticipated to include TACs with acute health impacts.

2. PROJECT EMISSIONS METHODOLOGY

Project emissions will be quantified for the construction and the operational phases of the Project. **Sections 2.1 and 2.2** describe the methodology to be used for evaluating the criteria air pollutants and TACs.

Trinity will calculate emissions consistent with methodologies, emission factors, and other default data in the most recent version of CalEEMod (i.e., Version 2022.1) but currently does not plan to utilize the CalEEMod software itself. The specific emission factors and their primary sources are presented in the following sections.

The emission factors and calculation methods that will be used to quantify emissions will be based on the following sections. Any deviations will be noted in the *Air Quality and HRA Results Memorandum*. Where available, local (Air District and California) and recently developed emission factors will be selected. In the absence of local emission factors, the most appropriate non-California or federal emission factor will be applied.

2.1 Construction Emissions Methodology

The construction phase of the Project will include reconfiguring the conveyors, excavation, grading, road pavement, and construction of the product pile enclosure. Emissions will result from excavation, grading, road pavement and the operation of off-road construction equipment, on-road worker vehicles, on-road equipment delivery vehicles, and on-road haul trucks for soil removal involved in the construction process. Additionally, road dust emissions will result from vehicle travel to and from the Facility. Construction equipment quantity and operating schedule will be based on project-specific data provided by Martin Marietta/EP and will be included in the *AQ and HRA Results Memorandum*. It is conservatively assumed that the facility will continue to operate at existing baseline levels during the construction period.

2.1.1 Calculation Methodology

Table 2-1, Table 2-2, and **Table 2-3** describe the emission calculation methodology associated with paving, excavation, and grading activity during the construction phase. **Table 2-4, Table 2-5**, and **Table 2-6** describe the emission calculation methodology for the construction phase emissions from off-road equipment and on-road vehicles.

Table 2-1. Emission Calculation Methodology – Asphalt Paving (Construction)

Parameter	Basis
Activity Summary	Asphalt paving of the Facility. Emissions result from off-gassing.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/acre) x Paved Area (acre) x Percentage Area Paved with Asphalt (%)
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated as the product of emission factors and paved area per the Project Description. The % area paved with asphalt is assumed to be 100%. **TAC:** It is assumed that negligible amounts of TACs are emitted from paving off-gassing.
Emission Factor	Criteria pollutant ***emission factors*** will be per CalEEMod 2022.1 Appendix C, Section 4.9. See **Table A-1 in Appendix A** for more details.
Paved Area	63,330 square feet or 1.45 acres.
% Area Paved with Asphalt	Assume 100% paving is with asphalt.

Table 2-2. Emission Calculation Methodology – Excavation Activity (Construction)

Parameter	Basis
Activity Summary	Excavation will be performed for the new warehouse and equipment foundations, electrical trenching, and for the installation of the enhanced drainage system. Emissions result from fugitive dust generated during the ground disturbances.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/hr) x Duration of Excavation (hr/yr) / 2,000 (lb/ton).
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated as the product of the emission factor and the duration of excavation. **TAC**: It is assumed that negligible amounts of TACs are emitted from excavation.
Emission Factor	Criteria pollutant ***emission factors*** will be calculated per CalEEMod 2022.1 User Guide Appendix C, Section 4.4.2 for bulldozing activities. See **Table A-2 in Appendix A** for more details.
Duration of Excavation	80 hours/year.
Control Efficiency	None applied.

Table 2-3. Emission Calculation Methodology – Grading Activity (Construction)

Parameter	Basis
Activity Summary	Grading of approximately 1.5 acres of area. Grading will be conducted for the portions of the site where the new warehouse will be built, new equipment would be installed, electrical trenching would occur, areas will be paved, and installation of the enhanced drainage system will occur.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/VMT) x VMT (miles/year) / 2,000 (lb/ton).
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated as the product of the emission factor, and calculated VMT. **TAC**: It is assumed that negligible amounts of TACs are emitted from grading.
Emission Factor	Criteria pollutant ***emission factors*** will be calculated per CalEEMod 2022.1 User Guide Appendix C, Section 4.4.1. See **Table A-3 in Appendix A** for more details.
VMT	VMT will be calculated per CalEEMod 2022.1 User Guide Appendix C, Section 4.4.1 based on grading area and the default grader blade width. See **Table A-3 in Appendix A** for more detail.
Control Efficiency	None applied.

Table 2-4. Emission Calculation Methodology – Off-Road Equipment Emissions (Construction)

Parameter	Basis
Activity Summary	Construction equipment (forklift, man lift, crane, paver, etc., as specified) utilized onsite to assist with construction.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (g/bhp-hr) x Equipment Horsepower (HP) x Load Factor x 0.00220462 (lb/g) x Annual Operating Hours (hr/year) / 2000 (lb/ton).
Basis of Calculation	**Criteria Air Pollutants:** Emissions will be calculated as the product of the emission factor, the operating hours, and the applicable equipment horsepower and load factor. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.
Emission Factor	Criteria pollutant ***emission factors*** will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-11 for Year 2027. See **Table A-4 in Appendix A** for more details.
Equipment Horsepower	***Equipment horsepower ratings*** will be based on project-specific data, if available. Otherwise, default horsepower ratings of off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-4 in Appendix A** for more details.
Load Factor	***Load factors*** will be based on project-specific data, if available. Otherwise, default load factors of off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-4 in Appendix A** for more details.
Annual Operating Hours	***Annual Operating Hours*** will be calculated as the product of the number of each equipment type and hours of operation per equipment type based on the construction schedule provided by Martin Marietta. See **Table A-4 in Appendix A** for more details.
Control Efficiency	None applied.

Table 2-5. Emission Calculation Methodology – On-Road Vehicle Exhaust Emissions (Construction)

Parameter	Basis
Activity Summary	Construction worker vehicle, equipment delivery vehicle, asphalt delivery vehicle, base underlay delivery vehicle, and soil haul truck vehicle travel to and from the Facility.
Calculation Formula	**Running Annual Emissions (tpy)** = Running Emission Factor (g/mi) x Annual VMT (mi/yr). Converted to units of tons. **Start-Up Annual Emissions (tpy)** = Start-Up Emission Factor (g/trip) x Total Trips per Year (trips/year). Converted to units of tons.
Basis of Calculation	**Criteria Air Pollutant:** Running emissions will be calculated as the product of the emission factor and the VMT. Start-up emissions will be calculated as the product of emission factor and the number of trips. Start-up emissions are included as construction worker vehicles, equipment delivery vehicles, and soil haul trucks are expected to cease operation and re-start once during the construction workday. It is assumed that all construction worker vehicles, equipment delivery vehicles, asphalt delivery vehicles, base underlay vehicles, and haul trucks are diesel-fueled; as such, no evaporative emissions are included in the analysis. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.
Emission Factor	Criteria pollutant ***emission factors*** will be obtained from EMFAC2025 v2.0.0 for Calendar Year 2027, Bay Area Air District Region. Heavy-duty trucks (representing equipment delivery vehicles, asphalt delivery vehicles, and base underlay vehicles) will be represented as Vehicle Category T7 Single Other Class 8. Construction worker trucks will be represented as Vehicle Category LDT2. Soil haul trucks will be represented as Vehicle Category T7 Single Dump Class 8. *CARB's Off-Model EMFAC Adjustment Factors to Remove the Impact of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus and Warranty Phase I Regulations (October 2025)* will be applied to the emission factors as applicable. ***Start-up emission factors*** will be obtained for emissions associated with engine start-up (STREX). ***Running emission factors*** will be obtained for emissions associated with engine exhaust (RUNEX), tire wear (PMTW), and brake wear (PMBW). See **Table A-5 in Appendix A** for more details.
VMT	***Vehicle miles traveled (VMT)*** for asphalt delivery vehicles, and base underlay vehicles will be calculated using the project-specific trip length and number of vehicle trips.

Parameter	Basis
	VMT for equipment delivery trucks, construction worker trucks, and the soil haul trucks will be calculated using the default miles per trip from CalEEMod 2022.1 User Guide Appendix G, Table G-15 using Analysis Level: Air District as the selection criteria for nonresidential, other-other trips and number of trips. The number of equipment delivery trucks will be calculated assuming that one truck is required for each construction equipment unit (crane, paver, etc.). The number of asphalt delivery trucks will be calculated based on the paved area (63,330 square feet), assuming that 0.039 tons of asphalt are required per square foot, and that each haul truck has a capacity of 20 tons. The number of base underlay delivery trucks will be calculated based on the paved area (63,330 square feet), assuming that 0.0645 tons of base underlay are required per square foot, and that each haul truck has a capacity of 20 tons. The number of soil haul truck trips will be calculated using the amount of soil excavated during construction (3,305 cubic yards) and the default soil haul truck capacity (16 cubic yards) per CalEEMod v2022.1 User Guide Section 4.6.1. The number of worker trucks is assumed to be 10 trips per day over the construction duration (140 days). See **Table A-6 in Appendix A** for more details.
Control Efficiency	None applied.

Table 2-6. Emission Calculation Methodology – Fugitive Road Dust (Construction)

Parameter	Basis
Activity Summary	Fugitive road dust emissions from construction worker vehicles, equipment delivery vehicles, asphalt delivery vehicles, base underlay delivery vehicles, and soil haul truck travel to/from the Facility on paved public roads.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/VMT) x Annual VMT (miles/yr) / 2,000 (lb/ton).
Basis of Calculation	Construction worker vehicles, equipment delivery vehicles, asphalt delivery vehicles, base underlay delivery vehicles, and soil haul truck criteria pollutant emissions will be calculated using the ***paved road emission factors*** and the ***annual VMT on paved roads***.
Emission Factor	**Criteria Pollutants**: The PM_{10} and $PM_{2.5}$ emission factors for travel on paved roads will be calculated per AP-42 Chapter 13.2.1 Equation 2. See **Table A-7 of Appendix A** for more details. **TACs**: Due to the paved nature of public roads, TAC emissions from off-site travel on public roads are assumed to be negligible.
VMT	***VMT*** will be the values determined by **Table 2-5** See **Table A-6 in Appendix A** for more details.
Control Efficiency	None applied.

2.2 Operation Emissions Methodology

This section describes the methodology to be used for calculating emissions associated with the Baseline and Project operational scenarios. An overview of each scenario is provided below and calculation details for each emission source group under both scenarios are provided in **Table 2-7 through Table 2-12**.

2.2.1 Project Baseline Overview

Since Pier 92 is an existing operation that generates criteria pollutant emissions, this air quality evaluation will consider the net change in emissions from the Project in accordance with CEQA guidelines. The Baseline conditions at the Facility involve the following operations:

- Material transfer points
  - Particulate matter (PM) emissions result from three drop points; one from the loader to the hopper, one from the hopper to the conveyor, and one from the conveyor to initial screen. Note that no emissions are expected from material transfer between the barge to raw material stockpile as the sand is saturated with water during offloading. No emissions are expected from material transfers between the initial wash plant screen and product/oversize stockpiles, as the material is saturated with water during washing.
- Storage piles
  - Storage piles are grouped into one emission source consisting of raw material, oversized material, and product sand. PM emissions result from wind erosion.
- Fugitive road dust emissions

- PM emissions resulting from the workers' vehicle travel to/from the Facility are assumed to be negligible.[5]

- Barge and Tug operations
  - Exhaust emissions result from barge engines (main, generator, and bow thruster) and tugboat engines (main and generator) exhaust during travel and hoteling.
- Off-road equipment
  - Emissions result from engine exhaust.
  - Fugitive dust PM emissions result from the travel of front-end loader on paved and unpaved roads in the Facility.
- On-road vehicles
  - Emissions result from engine exhaust, tire wear, and brake wear.
  - Fugitive dust PM emissions result from the travel of customer trucks on paved and unpaved roads in the Facility.
  - Fugitive dust PM emissions result from the travel of customer trucks on paved public roads outside the Facility to the adjacent concrete plants, and other off-site deliveries.
  - Fugitive dust PM and exhaust emissions resulting from the workers' vehicle exhaust are assumed to be negligible.[6]

Trinity will utilize information from Martin Marietta and EP (e.g., throughput, trips, etc.) to calculate Baseline emissions. Average daily and annual emissions will be calculated for the Baseline per existing operation, controls, and actual material throughput as described in **Table 2-7 through Table 2-12.**

2.2.2 Project Overview

The Project will involve the continued operation of the existing emission sources described above (**Section 2.2.1**) with additional improvements, outlined below. The Facility will continue operations in the same manner as before the Project. Trinity will use the operational limits proposed in the March 2024 Authority to Construct permit application (the ATC Application) submitted by Martin Marietta to calculate emissions for the Project. These operational limits include:

- 250 barge deliveries during any consecutive 12-month period;
- 800,000 tons of sand during any consecutive 12-month period;
- 40,000 truck trips during any consecutive 12-month period; and
- 72,728 front loader trips during any consecutive 12-month period.

The Facility boundary will increase by approximately 34,371 square feet as part of the Project. The change in boundary is not expected to contribute substantially to the emissions analysis to be conducted in accordance with this methodology memorandum. All operations are assumed to continue to occur within the updated boundary.

The Project proposes changes to the Facility to include additional improvements to reduce criteria pollutant emissions such as:

- Road Pavement

[5] Per EP's Air Quality Guidelines (Appendix C), roads with less than 21,500 annual average daily traffic (AADT) per day typically pose a cancer risk of less than 10 in a million for people nearby. In comparison, 100 worker vehicles add only about 0.05 in a million, which is much smaller than the threshold. As such, PM emissions resulting from workers' vehicle travel are excluded.

[6] Ibid.

- The Project will involve paving the main haul path used by customer trucks and the majority of the front-end loader travel route, which is expected to decrease emissions from road dust. Additionally, the employee/visitor parking area will also be paved.
- Emissions associated with paving are described in **Table 2-1**.

► Redesign of the Facility Layout
- The Project includes repositioning of the stockpiles and the conveyors to better serve the processing plant. The new layout is expected to reduce the distance traveled by the loaders and the distance traveled by customer trucks, which is expected to reduce road dust emissions.

► Use of enhanced controls
- The Project includes replacement or upgrades to the conveyors and processing screen at the wash plant to enclose them. The existing conveyors associated with offloading (220' and 125' conveyors) will remain uncovered.
- The Project involves constructing a warehouse for the product stockpile that blocks prevailing winds. This is expected to reduce wind erosion emissions from the stockpile and truck loading emissions.
- A new truck wheel wash system will replace the existing one, and a new truck bed spray system will also be installed at the Facility exit to minimize track out and emissions from the customer trucks immediately departing the Facility.

Table 2-7 through Table 2-12 explain the proposed methodology used to calculate emissions from the Facility for the Baseline Period and Project scenarios.

2.2.3 Calculation Methodology

The calculation methods to be used for estimating emissions in the operational phase are explained in detail in the following tables.

Table 2-7. Emission Calculation Methodology – Material Transfer Points

Parameter	Baseline Scenario	Project Scenario
Activity Summary	There are three transfer points located at the Facility's wash plant which generate emissions. • Loader to Feed Hopper • Hopper to Conveyor • Conveyor to Screen No emissions are expected from the transfer points past the screen as the sand will be saturated with water.	Project will have the same number of transfer points as the Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Maximum Annual Sand Throughput (ton/yr) x Emission Factor (lb/ton) x (1 - Control Efficiency [%]) / 2,000 (lb/ton).	
Basis of Calculation	**Criteria air pollutant** and **TAC** emissions will be calculated using the emission factors and the Baseline throughput with control efficiency numbers from literature.	Same as Baseline, except the emission factors will be multiplied by the Project throughput.
Emission Factor	**Criteria Air Pollutants**: The uncontrolled sand transfer ***emission factor*** for PM_{10} will be obtained from AP-42 Chapter 11.12, *Concrete Batching*, Table 11.12-2. The $PM_{2.5}$ emission factor will be assumed to be 15% of PM_{10} emissions per Air District Permit Handbook Chapter 11.5, *Concrete Batch Plants*. **TAC**: The respirable crystalline silica ***emission factor*** will be obtained from the Journal of the Air & Waste Management Association (JAWMA) article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The emission factor will be calculated using the ratio of PM_4 crystalline silica to PM_{10}. The PM_4 crystalline silica will be calculated using the correlation of bulk material crystalline silica (wt %) to PM_4 crystalline silica per site-specific sampling results. See **Table A-8 in Appendix A** for more details.	Same as Baseline emission factors.
Maximum Annual Sand Throughput	The ***annual throughput*** evaluated will be 349,078 tons/year as provided by EP and Martin Marietta.	The ***annual throughput*** evaluated will be 800,000 tons/year in accordance with the ATC application.

Parameter	Baseline Scenario	Project Scenario
Control Efficiency	The second and third transfer points are abated by water spray system with an assumed control efficiency of 70% for PM_{10} per Air District Permit Handbook, Chapter 11.5. The same 70% control will be conservatively used for $PM_{2.5}$ per EP guidance. For reference, CalEEMod uses a 74% watering control efficiency for PM_{10} and $PM_{2.5}$ if surfaces are watered 3 times a day. As such, 70% control efficiency is conservative.	Same as Baseline.

Table 2-8. Emission Calculation Methodology – Stockpiles

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Material stockpiles at the Facility are used to store raw material, oversize material, and product.	Same as Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/acre-day) x Maximum Stockpile Size (acres) x 365 (days/yr) / 2000 (lb/ton) x (1 – Control Efficiency [%]).	
Basis of Calculation	Criteria pollutant and TAC emissions will be calculated using the emission factors and the Baseline acreages. Emissions will be calculated for each stockpile and totaled in the summary.	Same as Baseline, except the emission factors will be multiplied by the Project stockpile acreages.
Emission Factor	**Criteria Air Pollutants**: The PM_{10} wind erosion ***emission factor*** will be calculated using Equation 4-9 from EPA's *Control of Open Fugitive Dust Sources: Final Report* (September 1988) for wind emissions from continuously active piles. The $PM_{2.5}$ emission factor will be assumed to be 15% of PM_{10} emissions per Air District's Permitting Handbook. **TAC**: The respirable crystalline silica ***emission factor*** will be obtained from the JAWMA article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The emission factor will be calculated using the ratio of PM_4 crystalline silica to PM_{10}. The PM_4 crystalline silica will be calculated using the correlation of bulk material crystalline silica (wt %) to PM_4 crystalline silica per site-specific sampling results. See **Table A-9 of Appendix A** for more details.	Same as Baseline emission factor, except a lower emission factor is expected for the Product Pile as a result of the warehouse enclosure. See **Table A-9 of Appendix A** for more detail.
Maximum Stockpile Size	The ***maximum stockpile size*** will be based on the sizes during the Baseline provided by Martin Marietta. • 0.46 acres Raw Material Stockpile • 0.014 acres Oversized Stockpile • 0.238 acres Product Sand Stockpile	The ***maximum stockpile size*** of Project stockpiles will be based on values in the ATC Application: • 0.72 acres Raw Material Stockpile • 0.014 acres Oversized Stockpile • 0.31 acres Product Sand Stockpile

Parameter	Baseline Scenario	Project Scenario
Control Efficiency	All stockpiles are abated by water spray system with an assumed control efficiency of 70% for PM_{10} per Air District Permit Handbook, Chapter 11.5. The same 70% control will be conservatively used for $PM_{2.5}$ per EP guidance. For reference, CalEEMod uses a 74% watering control efficiency for PM_{10} and $PM_{2.5}$ if surfaces are watered 3 times a day. As such, 70% control efficiency is conservative.	Same as Baseline for the Raw Material and Oversized Stockpiles. Product stockpile will be in an enclosed warehouse. Control will be applied in the calculation of the emission factor.

Table 2-9. Emission Calculation Methodology – Fugitive Road Dust

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Emissions from loader and customer truck roadway travel within the Facility, and emissions from customer truck travel outside the Facility to customer sites during the Baseline scenario. Per the transportation analysis, 65% of trips terminate at the adjacent concrete plants (0.17 miles away) and the remaining 35% of trips terminate at a different offsite location (approx. 4.53 miles away on average). For emission calculation purposes, off-site emissions will be calculated using the weighted average trip distance between the adjacent concrete plants and other off-site locations. For modeling purposes, off-site emission rates will be calculated for travel to off-site delivery locations as follows: ► Adjacent concrete plants: Distance between the Facility and the CEMEX main entrance driveway: 0.17 miles. ► Other off-site locations: Distance between the Facility and the freeway: 1.17 miles.	Same as Baseline, except using the new Facility layout for trip lengths within the Facility. The truck trip ratio between adjacent concrete plants and other off-site locations is 65% to 35%, respectively, per the project average ratio provided by EP based on the methodology used in the transportation analysis.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (lb/VMT) x Annual VMT (miles/yr) x (1 - Control Efficiency [%]) / 2,000 (lb/ton).	
Basis of Calculation	Loader criteria pollutant emissions will be calculated based on loader path. The entire loader path is unpaved, as such emissions will be calculated using the ***unpaved road emission factors*** listed below and Baseline ***annual VMT***. Customer truck criteria pollutant emissions will be calculated based on the customer truck path. Travel through paved roads within the Facility and on public roads will be calculated using the ***paved road emission factors*** and the Baseline truck ***annual VMT on paved roads.*** Travel through unpaved roads will be calculated using the ***unpaved road emission factors*** and the Baseline truck ***annual VMT on unpaved roads***. Loader and customer truck TAC emissions will be calculated using TAC emission factors listed below.	As part of facility improvements, most loader pathways and all customer truck pathways will be paved. Loader criteria pollutant emissions will be calculated using the ***paved and unpaved emission factors*** listed below and the projected loader ***annual VMT*** for travel on each respective type of roadway. Customer truck criteria pollutant emissions will be calculated using the **paved emission factor** listed below and the **projected truck VMT**. TAC calculations methodology will be the same as Baseline.

Parameter	Baseline Scenario	Project Scenario
Emission Factor	**Criteria Pollutants**: The PM_{10} and $PM_{2.5}$ emission factors for travel on paved roads will be calculated per AP-42 Chapter 13.2.1 Equation 2. The PM_{10} and $PM_{2.5}$ emission factors for travel on unpaved roads will be calculated per AP-42 Chapter 13.2.2 Equation 1a. See **Table A-10 of Appendix A** for more details. **TACs**: The respirable crystalline silica, arsenic, beryllium, cadmium, cobalt, copper, lead, nickel, selenium, vanadium, naphthalene, benzene, toluene, ethylbenzene, xylenes, hexavalent chromium, and mercury speciation will be per site-specific road dust sampling and analysis conducted in August 2024. Due to the paved nature of public roads, TAC emissions from travel off-site are assumed to be negligible.	Same as Baseline emission factors.

Parameter	Baseline Scenario	Project Scenario
VMT	***VMT*** will be calculated using trip length and number of loader and truck trips under the Baseline scenario. The trip length within the Facility will be measured using Google Earth with the route provided by the Project sponsor. For emission calculation purposes, the trip length outside the Facility will be the weighted average trip length calculated by EP based on the methodology from the transportation analysis. For modeling purposes, the trip length outside the Facility will be the distance between the Facility to the nearest interstate (1.17 miles), reflecting other off-site delivery locations, and to the adjacent concrete plants (0.17 miles), which are measured using Google Earth. For emission calculation purposes, the number of trips will be the actual average truck trips over the Baseline as provided by EP. For modeling purposes, the number of trips for the deliveries will be calculated by also applying the 65% adjacent concrete plant to 35% other off-site delivery ratio provided by EP (calculated using the Transportation Analysis methodology). See **Table A-10 in Appendix A** for more details.	Same as Baseline scenario, except using values for Project (i.e., updated trip lengths as measured with Google Earth for onsite travel and the weighted average trip lengths calculated by EP using the methodology from the transportation analysis for all off-site travel to adjacent concrete plants and other off-site delivery) based on project average. The number of trips will be calculated based on the loader or truck capacity and the Project throughput. See **Table A-10 in Appendix A** for more details.
Control Efficiency	The unpaved roads are controlled via watering with an assumed control efficiency of 70% for PM_{10} per the Air District's Permit Handbook. A 40% control efficiency will be used for $PM_{2.5}$ per the Air District's Permit Handbook. The paved roads within the Facility are controlled via watering with an assumed control efficiency of 70% per the Air District's Permit Handbook.	Same as Baseline control efficiency for paved and unpaved roads. In addition, unpaved loader travel will occur within the warehouse. The control efficiency for the warehouse will be 75% (wind screen on windward side), per Mojave Desert Air Quality Management District (MDAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries.

Table 2-10. Emission Calculation Methodology – Barge and Tugboats

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Barge and tugboat emissions result from engine exhaust during travel and hoteling.	Same as Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (g/bhp-hr) x 0.00220462 (lb/g) x Engine Power (bhp) x Annual Operating Time (hr/year) x Engine Load (%) / 2,000 (lb/ton).	
Basis of Calculation	**Criteria Air Pollutants:** Emissions will be calculated using the respective engine emission factors, engine load, engine horsepower, number of engines per vessel, operating times per trip, and the number of trips in the Baseline. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.	Same as Baseline, except the emission factors will be multiplied by the projected maximum annual operating time.
Emission Factor	***Emission factors*** for criteria pollutant emissions will be from EPA's Marine Compression-Ignition (CI) Engines certification database (June 28, 2004) based on the actual vessel engines provided by the Project sponsor. See **Table A-11 in Appendix A** for reference.	Same as Baseline emission factors.
Engine Power	***Engine power*** will be based on project-specific data. See **Table A-12 in Appendix A** for reference.	Same as Baseline engine power.
Annual Operating Time	The ***annual operating time*** will be based on the number of trips in the Baseline and the operating time per trip based on source activity as provided by the project sponsor.	The ***annual operating time*** will be based on the ATC Application. Annual operating time is assumed that barges are loaded to full capacity for each trip. See **Table A-12 in Appendix A** for reference.
Engine Load	***Engine load*** will be based on project-specific data.	Same as Baseline engine load factors.
Control Efficiency	None applied.	Same as Baseline.

Table 2-11. Emission Calculation Methodology – Off-Road Equipment Exhaust (Operational)

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Loaders, Water Truck, Forklifts, Man Basket, Bobcat, etc. utilized onsite to support Facility operations.	Same as Baseline.
Calculation Formula	**Annual Emissions (tpy)** = Emission Factor (g/bhp-hr) x Equipment Horsepower (HP) x Load Factor x 0.00220462 (lb/g) x Total Annual Operating Hours (hr/year) / 2,000 (lb/ton)	
Basis of Calculation	**Criteria Air Pollutants**: Emissions will be calculated using the emission factors and the operating hours will be based on the historical operating schedule during the Baseline. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.	Same as Baseline, except assuming the maximum Project operating schedule will be used.
Emission Factor	Criteria pollutant ***emission factors*** will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-11 and averaged for Baseline Period 2020-2024. See **Table A-13 in Appendix A** for reference.	Same as Baseline emission factors, except using the emission factors for Year 2027. See **Table A-13 in Appendix A** for reference.
Equipment Horsepower	***Equipment horsepower ratings*** will be based on project-specific data as available. Otherwise, default horsepower ratings and load factors of the off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-13 in Appendix A** for reference.	Same as Baseline equipment horsepower.
Load Factor	***Equipment load factors*** will be based on project-specific data as available. Otherwise, default horsepower ratings and load factors of the off-road equipment will be obtained from CalEEMod 2022.1 User Guide Appendix G, Table G-12. See **Table A-13 in Appendix A** for reference.	Same as Baseline load equipment load factors.
Annual Operating Hours	***Annual operating hours*** will be based on the operational schedule provided by Martin Marietta based on the Baseline conditions determined by EP. See **Table A-14 in Appendix A** for reference.	***Annual operating hours*** will be based on the operational schedule provided by Martin Marietta for the Project, which will be based on Air District permit limits, per EP guidance. See **Table A-14 in Appendix A** for reference.
Control Efficiency	All diesel equipment at site uses Tier 4 engines. No further control efficiency is applied as the CalEEMod emission factors account for the phase out of older engines as time goes on.	Same as Baseline. All diesel equipment will continue to use Tier 4 engines.

Table 2-12. Emission Calculation Methodology – On-Road Vehicle Emissions (Operational)

Parameter	Baseline Scenario	Project Scenario
Activity Summary	Customer truck exhaust emissions during travel within the Facility boundary and travel outside of the Facility boundary to adjacent customer sites (concrete plants) or to other off-site locations during Baseline. Per the transportation analysis, 65% of trips terminate at the adjacent concrete plants (0.17 miles away) and the remaining 35% of trips terminate at a different off-site location (approx. 4.53 miles away on average). For emission calculation purposes, off-site emissions will be calculated using the weighted average trip distance between the adjacent concrete plants and other off-site locations. For modeling purposes, off-site emission rates will be calculated for travel to off-site delivery locations as follows: ► Adjacent concrete plants: Distance between the Facility and the CEMEX main entrance driveway: 0.17 miles. ► Other off-site locations: Distance between the Facility and the freeway: 1.17 miles.	Same as Baseline, except using travel lengths based on the new travel pathways within the Facility. The truck trip ratio between adjacent concrete plants and other off-site locations is 65% to 35%, respectively, per the project average ratio calculated by EP using the same methodology used by the transportation analysis.
Calculation Formula	**Running Annual Emissions (tpy)** = Running Emission Factors (g/mi) x Annual VMT (mi/yr). Converted to units of ton. **Idling Annual Emissions (tpy)** = Idling Emission Factors (g/trip/day) / 24 (hr/day) / 60 (mins/hr) x Idling time (mins/trip) x Annual Trips (trips/year). Converted to units of ton.	
Basis of Calculation	**Criteria Air Pollutants:** Running emissions will be calculated using the emission factors and the Baseline VMT. Idling emissions will be calculated using the emission factors, maximum idling time, and number of trips. **TAC:** DPM emissions will be conservatively assumed to be equivalent to PM_{10} exhaust emissions.	Same as Baseline, except the running emission factors will be multiplied by Project VMT and idling emissions factor will be multiplied by the assumed idling time and Project number of trips.
Emission Factor	Criteria pollutant ***emission factors*** will be the average for Calendar Years 2020 through 2024 from EMFAC2025 v2.0.0 for Region Type: Air District – Bay Area Air District for Vehicle Category T7 Single Dump Class.	Same as Baseline emission factor, except emission factors will be for Calendar Year 2027 only.

Parameter	Baseline Scenario	Project Scenario
	CARB's Off-Model EMFAC Adjustment Factors to Remove the Impact of Advanced Clean Trucks, Zero-Emission Airport Shuttle, Heavy-Duty Omnibus and Warranty Phase I Regulations (October 2025) will be applied to the emission factors as applicable. ***Running emission factors*** will be obtained for emissions associated with the engine running (RUNEX), tire wear (PMTW), and brake wear (PMBW). ***Idling emission factors*** will be obtained for emissions associated with idling (IDLEX). It is assumed that customer trucks do not shut down engines during loading and that they are diesel fueled. See **Table A-15 in Appendix A** for reference.	
VMT	***VMT*** will be calculated using trip length and number of truck trips inside the Facility boundary and on public roads. The trip length within the Facility will be measured using Google Earth with the route provided by the Project sponsor. For emission calculation purposes, the trip length outside the Facility will be the weighted average trip length calculated by EP based on the methodology from the transportation analysis. For modeling purposes, the trip length outside the Facility will be the distance between the Facility to the nearest interstate (1.17 miles), reflecting other off-site delivery locations, and to the adjacent concrete plants (0.17 miles), which are measured using Google Earth. See **Table A-10 in Appendix A** for reference.	Same as Baseline scenario, except using values for Project (i.e., updated trip lengths as measured with Google Earth for onsite travel and the weighted average trip lengths calculated by EP using the methodology from the transportation analysis for off-site travel) based on project average. **VMT** will be calculated using trip length and number of truck trips inside the Facility boundary and on public roads. The trip length for the Project Period will be based on the updated Facility layout. See **Table A-10 in Appendix A** for reference.

Parameter	Baseline Scenario	Project Scenario
Annual Trips	For emission calculation purposes, the *number of trips* will be provided by Martin Marietta. These are the actual trips that occurred during the Baseline period. For modeling purposes, the number of trips for the all off-site deliveries (adjacent concrete plants and off-sites delivery) will be calculated by also applying the ratio calculated by EP using the methodology from the Transportation Analysis. See **Table A-10 in Appendix A** for reference.	Same as Baseline scenario, except the *number of truck trips* will be based on the ATC Application for the Project. See **Table A-10 in Appendix A** for reference.
Idling Time	Assumes a total of five (5) minutes of *idling time* per trip. This is a conservative estimate provided by Martin Marietta based on the loadout time, which is the time that each truck remains stationary to be loaded and weighed. Typical target loadout times are 3 minutes per truck, but 5 minutes is used to conservatively account for occasional loading and/or weighing delays.	Same as Baseline.
Control Efficiency	None applied.	Same as Baseline.

3. AIR DISPERSION MODELING METHODOLOGY

This section presents the air dispersion modeling methodology that will be used to evaluate potential health risk impacts from exposure to TACs, and $PM_{2.5}$ associated with the Project's construction and operational phases. Potential health risk impacts from exposure to TACs and $PM_{2.5}$ are evaluated to compare risks to the applicable San Francisco Planning Air Quality CEQA Thresholds of Significance. Construction emission sources will include off-road equipment. Operation emission sources will include emissions from material transfer, storage piles, fugitive road dust, barge and tug, off-road equipment, and on-road vehicles. Both the Baseline Period operational phase and Project operational phase will be modeled to determine the net Project impact.

The objective of the air dispersion modeling is to determine the Project's local risks and hazards, which will include cancer risk, chronic hazard index, acute hazard index and annual average $PM_{2.5}$ concentration impact. The Project's construction phase is not anticipated to include TACs with acute health impacts. The Project's cancer risk, chronic hazard index, and acute hazard index will be determined with HRA models in accordance with Appendix E. The annual average $PM_{2.5}$ ambient concentration will be modeled in accordance with U.S. EPA's Appendix W to Part 51 Guideline on Air Quality Models. Below is a list of the six (6) modeling scenarios:

- Construction phase HRA model
- Construction phase annual average $PM_{2.5}$ model
- Baseline Period operation phase HRA model
- Baseline Period operation phase annual average $PM_{2.5}$ model
- Project operation phase HRA model
- Project operation phase annual average $PM_{2.5}$ model

The following subsections describe such methodologies and the differences between the HRA and annual average $PM_{2.5}$ models where applicable. The latest versions of each software (e.g., AERMOD) available at the time of modeling will be agreed upon by EP and used.

3.1.1 Air Dispersion Model

AERMOD will be used with Trinity's *BREEZE™ AERMOD Suite* software to calculate ambient air concentrations at the specified receptor locations and heights using the regulatory default parameters as described in Chapter 2.3 of the AERMOD user guide (US EPA, 2024).

3.1.2 Coordinate System

The locations of emission sources and receptors will be represented in the Universal Transverse Mercator (UTM) coordinate system using the World Geodetic System (WGS84) projection. The UTM grid divides the world into coordinates that are measured in north meters (measured from the equator) and east meters (measured from the central meridian of a particular zone, which is set at 500 km).

3.1.3 Terrain Elevations

The terrain elevation for each receptor, emission source, and building will be imported from the United States Geological Survey (USGS) 1/3 arc-second National Elevation Dataset (NED). The terrain elevations will be determined from USGS data. The terrain height for each individual modeled receptor and emission source will be determined by assigning the interpolated height from the digital terrain elevations surrounding each modeled receptor and emission source.

3.1.4 Land Use Considerations

The land use categorization, urban or rural, is applied in AERMOD to determine whether turbulence associated with the urban heat island effect should affect the project's dispersion patterns. The land use category will be determined using AERSURFACE as recommended in Appendix E. AERSURFACE uses publicly available national land cover datasets and look-up tables of surface characteristics to classify land into 20 categories, of which four make up the urban categorization. If AERSURFACE determines that over 50% of the land within a 3-kilometer study radius from the Project classifies as developed, the urban categorization will be applied. Conversely, if less than 50% of the land within the studied radius classifies as developed, the rural categorization will be applied. If the Project classifies as an urban area, it will be modeled with an urban population of 827,526, according to the July 1, 2024, US Census population estimate (US Census Bureau, n.d.).

3.1.5 Meteorological Data

Meteorological data will be obtained from the Air District's AERMOD-ready meteorological data sets. Surface air data will be pulled from the San Francisco International Airport (KSFO) meteorological tower (Station ID 23234; elevation of 2.4 meters). KSFO is the most representative of the Project's site conditions as it is both one of the closest meteorological towers and oriented along the San Francisco Peninsula. Upper air data will use the Oakland International Airport (Station ID 23230), which is used for all modeling projects in the Bay Area.

3.1.6 Building Downwash

The emission sources at the Facility have been evaluated in terms of their proximity to nearby structures. The purpose of this evaluation is to determine if stack discharges may become caught in the turbulent wake of a building or structure. The downwash of the plume can result in elevated ground-level concentrations.

The Project operational phase includes an enclosure over the product sand stockpile. Truck idling emissions have the potential to become caught in the turbulent wake of the product sand enclosure. Therefore, the Building Profile Input Program (BPIP) with Plume Rise Model Enhancements (PRIME) will be used to determine the building downwash characteristics for the truck idling emission source in 10-degree directional intervals.

The construction and baseline operational phases are not expected to include any stack discharges that may become caught in the turbulent wake of a building or structure. As such, the BPIP with PRIME analysis will not be applicable to these air dispersion models.

3.1.7 Receptors

According to U.S. EPA regulations, "ambient air" is defined as the portion of the atmosphere external to the source, to which the general public has access. The dispersion modeling concentrations will be determined for ambient air locations (i.e., receptors). The Facility fence line will be the ambient air boundary for all modeling demonstrations.

The following ground-level receptors will be used to ensure ambient air is protected in the annual average $PM_{2.5}$ model and HRA model:

- Boundary receptors with 20-meter (m) spacing; and
- A 20-meter by 20-meter grid extending 1,000 meters in all directions from the facility center. The receptor grid will align with the Citywide HRA receptor grid. Additional 20-meter by 20-meter gridding

will be used to buffer the customer truck path roadways and worker and resident areas. The customer truck path receptor grid will extend a minimum of 1,000 feet (305 meters) from the customer truck path.

Figure 3-1 shows the proposed model receptor grid. All receptors for the HRA models will be set at a flagpole height of 1.8 meters to conservatively represent an average human's breathing height as recommended by EP's air quality guidance (San Francisco Planning Department, 2025).



Figure 3-1. Model Receptors

3.1.8 Emission Sources

3.1.8.1 Construction Phase

The construction phase involves emission sources which are best represented in AERMOD as area sources. Area sources are two-dimensional representations of diffused emissions emitted at a uniform height. The

fugitive exhaust emissions from grading, excavation, and off-road equipment will be summed and modeled as a polygon area source over the construction area. The construction area is contained within the bottom half of the facility. The construction phase is estimated to last up to seven months and will require minimal construction materials. Per Martin Marietta, the construction phase will have a total of 1,090 trips of equipment delivery, asphalt delivery, base underlay delivery, and soil haul trucks, and 1,400 trips of construction worker trucks. Averaged over the construction period of seven months, or conservatively 140 active construction days, the construction phase would have approximately 17.8 annual average daily traffic (AADT). EP's Air Quality Guidelines Appendix C provides a methodology for screening health impacts using a linear regression of AADT by vehicle type. The methodology includes emissions from exhaust, brake wear, tire wear, and entrained roadway dust and estimates maximum health risks representative of a receptor located adjacent to a roadway (e.g., a receptor on the sidewalk) For total AADT and a 95% quantile regression, it is conservatively estimated that 7,700 AADT would correlate to a 10 in one million risk. Applying this regression to the Project's construction trips of 17.8 total AADT correlates to a 0.02 in one million cancer risk. For $PM_{2.5}$, the 95% quantile total AADT regression correlates to a 0.0005 $\mu g/m^3$ annual average concentration. These conservative screening values will be added to the overall Project's impacts to conservatively review implications to health risk. Construction source parameters are summarized in **Table 3-1** below.

Table 3-1. Modeling Parameters - Construction Area Source

Source	Area (m^2)	Release Height (m)	Initial Vertical Dimension (m)
Construction Equipment [a, b]	Construction Area	1.30	1.21

a. Construction Equipment will be modeled as a single area source covering the construction area.
b. Release height and the initial vertical dimension are per the Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks (Air District, 2022).

3.1.8.2 Operational Phase

The operation phases, baseline and Project, involve emission sources which are best represented in AERMOD as point, area, or volume sources. Point sources are intended to represent emissions sources with an identifiable exhaust location and stack. The barge hoteling and idling emissions from haul trucks have identifiable exhaust parameters and are generally localized and thus will be represented as point sources. Similar to the construction phase, exhaust emissions from off-road equipment will be represented as a polygon area source over the Facility property. Stockpiles will also be modeled as area sources per Appendix E. Volume sources are three-dimensional sources of diffuse emissions, such as fugitive emissions. The Project's remaining fugitive emission sources, such as dust from material handling, truck and loader dust entrainment, and barge, truck, and loader exhaust emissions, will be represented as volume sources. Where there are receptors located within the volume source's exclusion zones, area sources will be used instead in accordance with EPA's haul route guidance (U.S. EPA, 2012). Both dust and exhaust area sources will be used. Source parameters for baseline and Project operation models are summarized in **Table 3-2** through **Table 3-4** below. Emission sources will be modeled to reflect **Figure 3-2** and **Figure 3-3**.

Table 3-2. Modeling Parameters – Baseline and Project Operation Point Sources

Source	Release Height (m)	Stack Temperature (K)	Stack Velocity (m)	Stack Diameter (m)
Baseline and Project				
Barge Hoteling [a]	15.20	573.15	20	0.30
Truck Idling [b]	2.55	644	17.8	0.305

a. Barge Hoteling parameters are from the San Francisco Citywide HRA Table 8 towboats at-berth parameters (San Francisco Department of Public Health, 2020).
b. Truck Idling parameters are from the San Francisco Citywide HRA Section 3.4 and Table 7 (San Francisco Department of Public Health, 2020).

Table 3-3. Modeling Parameters – Baseline and Project Operation Area Sources

Source	Area (m^2) [a, b]	Release Height (m)	Initial Vertical Dimension (m)
Baseline			
Raw Material Stockpile [c]	1,771	4.57	2.13
Product Sand Stockpile [c]	934	4.57	2.13
Oversize Material Stockpile [c]	70	4.57	2.13
Off-Road Equipment [d]	11,341	1.30	1.21
Off-site Transfer Truck Highway Dust Area [e]	22,778	3.40	3.16
Off-site Transfer Truck Highway Exhaust Area [g]	22,778	2.55	2.37
Off-site Transfer Truck Concrete Plant Dust Area [e]	3,341	3.40	3.16
Off-site Transfer Truck Concrete Plant Exhaust Area [g]	3,341	2.55	2.37
Unpaved Loader Dust Area [d]	197	1.30	1.21
Unpaved Loader Exhaust Area [f]	197	3.20	2.97
Unpaved Transfer Truck Dust Area [e]	358	3.40	3.16
Unpaved Transfer Truck Exhaust Area [g]	358	2.55	2.37
Paved Transfer Truck Dust Area [e]	186	3.40	3.16
Paved Transfer Truck Exhaust Area [g]	186	2.55	2.37
Project			
Raw Material Stockpile [c]	3,072	5.03	2.34
Product Sand Stockpile [c]	1,245	6.55	3.05
Oversize Material Stockpile [c]	59	2.59	1.21
Off-Road Equipment [d]	13,688	1.30	1.21
Off-site Transfer Truck Highway Dust Area [e]	22,778	3.40	3.16
Off-site Transfer Truck Highway Exhaust Area [g]	22,778	2.55	2.37
Off-site Transfer Truck Concrete Plant Dust Area [e]	3,341	3.40	3.16
Off-site Transfer Truck Concrete Plant Exhaust Area [g]	3,341	2.55	2.37
Unpaved Loader Dust Area [d]	441	1.30	1.21
Unpaved Loader Exhaust Area [f]	441	3.20	2.97
Paved Loader Dust Area [d]	279	1.30	1.21
Paved Loader Exhaust Area [f]	279	3.20	2.97
Paved Transfer Truck Dust Area [e]	413	3.40	3.16
Paved Transfer Truck Exhaust Area [g]	749	2.55	2.37

a. Facility areas and stockpile areas will be modeled based on **Figure 3-2** and **Figure 3-3** and calculated in AERMOD.
b. Dust and Exhaust areas will be modeled in accordance with EPA's haul route guidance and calculated in AERMOD (U.S. EPA, 2012).
c. Stockpile parameters were calculated per NSSGA Modeling Fugitive Dust Sources with AERMOD (NSSGA, 2007). Per section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. The average baseline raw material, product sand, and

oversize material stockpile heights are assumed to be 30 feet. The projected Project raw material stockpile height is 33 feet, the product sand stockpile height is 43 feet, and the oversize material stockpile height is 17 feet.

d. Release height and the initial vertical dimension are per the Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks (Air District, 2022).
e. Release height and the initial vertical dimension are per the Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks (Air District, 2022).
f. The Loader Exhaust Area release heights per Appendix E Table 7 recommendations and site-specific equipment dimensions. The release height was set equal to the equipment specific exhaust height above ground multiplied by a factor of 1.7 to account for the source's motion and 0.5. The initial vertical dimension is equal to the plume height divided by 2.15 per recommendation for surface-based sources. The Loader exhaust height above ground is approximated from online available equipment specifications for CAT Medium Wheel Loader Model 982XE (CAT, 2025).
g. Transfer Truck Exhaust Area parameters per the San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks (San Francisco Department of Public Health, 2020).

Table 3-4. Modeling Parameters – Baseline and Project Operation Volume Sources

Source	Number of Sources	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)
Baseline				
Transfer Point 1 – Off-loaded Pile to Hopper [a]	1	3.05	0.81	1.77
Transfer Point 2 – Hopper to Conveyor [b]	1	1.59	0.18	0.25
Transfer Point 3 – Conveyor to Scalping Screen [b]	1	6.25	0.18	2.06
Unpaved Loader Two-Way Road Dust [c, d]	4	1.30	9.33	1.21
Unpaved Loader Two-Way Road Exhaust [c, d]	4	3.20	9.33	2.97
Unpaved Transfer Truck One-Way Road Dust [c, e]	16	3.40	4.09	3.16
Unpaved Transfer Truck One-Way Road Exhaust [c, e]	16	2.55	4.09	2.37
Unpaved Loader Product Pile Dust [c, d]	6	1.30	5.64	1.21
Unpaved Loader Product Pile Exhaust [c, d]	6	3.20	5.64	2.97
Barge Traffic [f]	777	15.20	23.26	3.53
Project				
Transfer Point 1 – Off-loaded Pile to Hopper [a]	1	3.05	0.81	1.77
Transfer Point 2 – Hopper to Conveyor [b]	1	1.59	0.18	0.25
Transfer Point 3 – Conveyor to Scalping Screen [b]	1	6.25	0.18	2.06
Paved Loader Two-Way Road Dust [c, d]	5	1.30	9.90	1.21
Paved Loader Two-Way Road Exhaust [c, d]	5	3.20	9.90	2.97
Paved Transfer Truck One-Way Road Dust [c, e]	18	3.40	4.09	3.16
Paved Transfer Truck One-Way Road Exhaust [c, e]	18	2.55	4.09	2.37
Barge Traffic [f]	777	15.20	23.26	3.53

a. Transfer point 1 source parameters were determined per NSSGA section 5.3.6.5 guidance for Truck unloading and used Loader equipment specifications from CAT Medium Wheel Loader Model 982XE (CAT, 2025; NSSGA, 2007).
b. Transfer point 2 and 3 source parameters were determined per NSSGA section 5.3.2 for single, elevated, conveyor transfer points (NSSGA, 2007). The release height is equal to the distance from the ground to the center of the source, the initial lateral dimension is equal to the width of the conveyor divided by 4.3, and the initial vertical dimension is equal to the plume height (the total drop distance) divided by 4.3.
c. The Loader and Transfer Truck Road Dust and Exhaust release heights and initial vertical dimensions are equal to the Loader and Transfer Truck Dust and Exhaust Area release heights and initial vertical dimensions in **Table 3-3.**
d. Per the Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for two lane roadways is the road width plus 6 meters over 2.15 (Air District, 2022). The road width was estimated in Google Earth.
e. Per EPA Haul Road Workgroup Final Report, the initial lateral dimension for one lane roadways is the vehicle width plus 6 meters over 2.15 (EPA, 2011). The Transfer Truck vehicle width is approximated to be equal to the wheel wash width, 110 inches.
f. Barge Traffic parameters are from the San Francisco Citywide HRA Table 8 (San Francisco Department of Public Health, 2020).

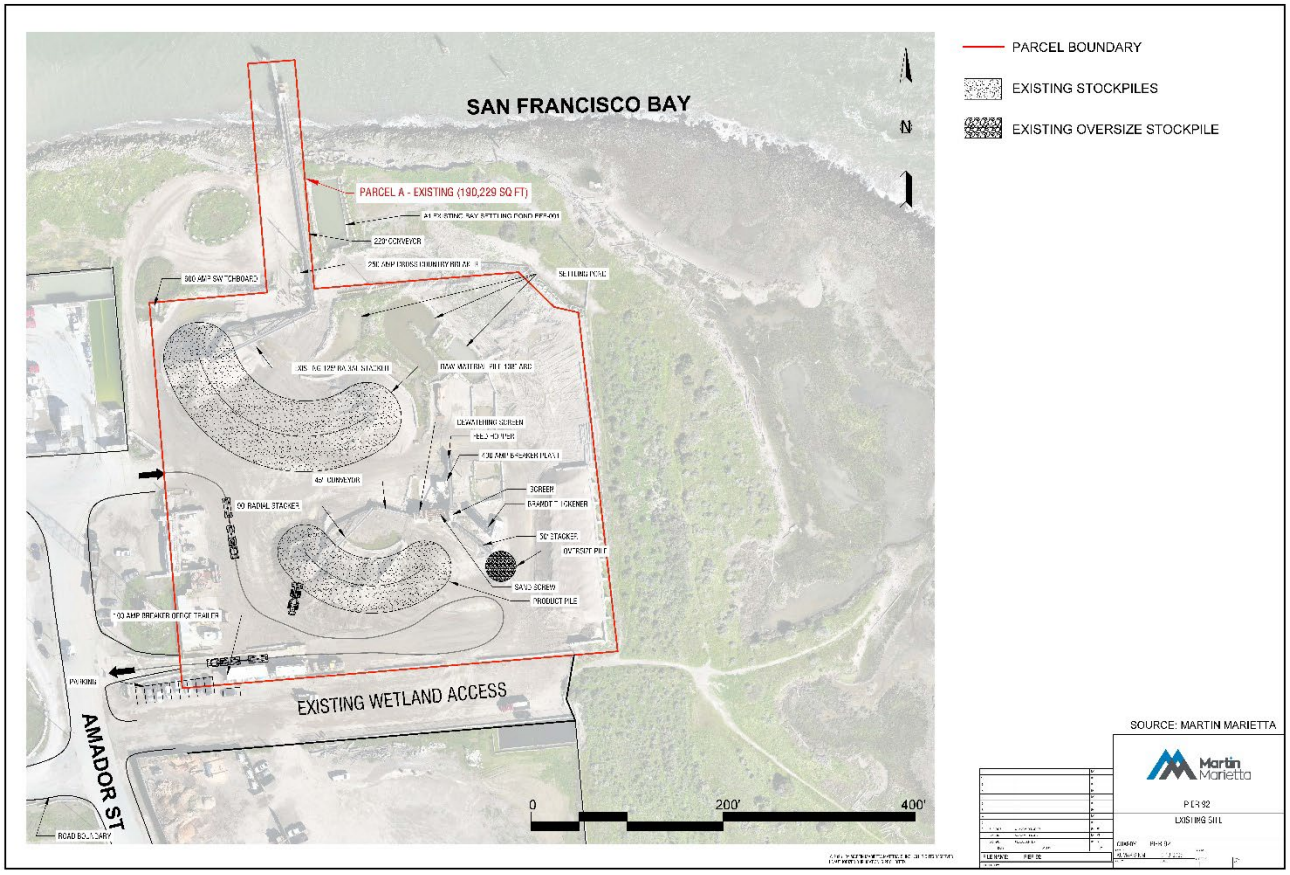
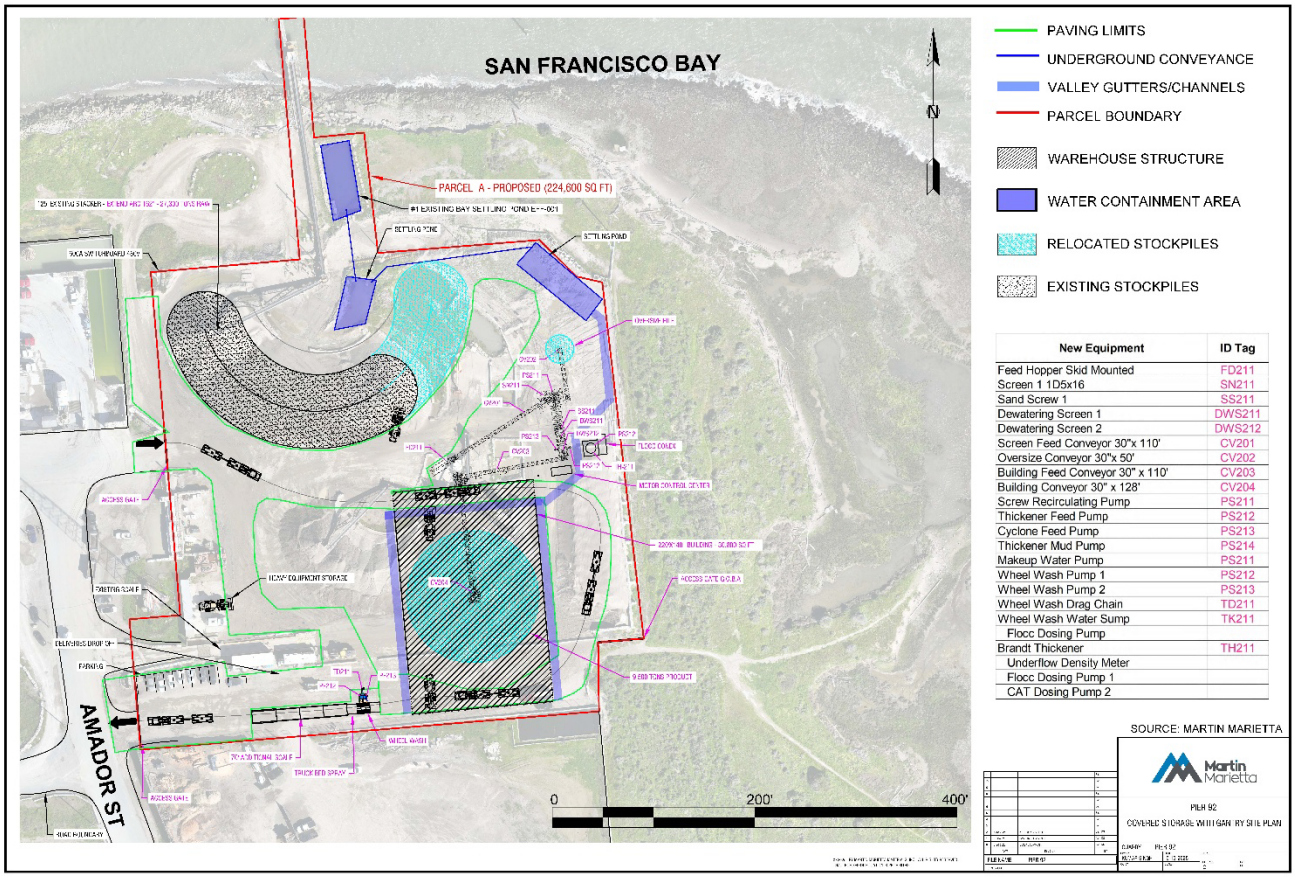


Figure 3-2. Facility Map – Baseline



New Equipment	ID Tag
Feed Hopper Skid Mounted	FD211
Screen 1 1D5x16	SN211
Sand Screw 1	SS211
Dewatering Screen 1	DWS211
Dewatering Screen 2	DWS212
Screen Feed Conveyor 30"x 110'	CV201
Oversize Conveyor 30"x 50'	CV202
Building Feed Conveyor 30" x 110'	CV203
Building Conveyor 30" x 128'	CV204
Screw Recirculating Pump	PS211
Thickener Feed Pump	PS212
Cyclone Feed Pump	PS213
Thickener Mud Pump	PS214
Makeup Water Pump	PS211
Wheel Wash Pump 1	PS212
Wheel Wash Pump 2	PS213
Wheel Wash Drag Chain	TD211
Wheel Wash Water Sump	TK211
Flocc Dosing Pump	
Brandt Thickener	TH211
Underflow Density Meter	
Flocc Dosing Pump 1	
CAT Dosing Pump 2	

Figure 3-3. Facility Map – Operational

3.1.9 Emission Rates

For annual average $PM_{2.5}$ modeling, the calculated annual $PM_{2.5}$ emissions representative of each source or source group converted to gram per second (g/s) will be used. The "$PM_{2.5}$" pollutant option will be used and the special analysis for SO_2, NO_2, or $PM_{2.5}$ NAAQS option in AERMOD will be disabled.

For the HRA models, the AERMOD dispersion model will be run with an equivalent unit emission rate of 1 g/s. Point sources and individual volume sources will be modeled with a unit emission rate of 1 g/s. For area sources, the emission rate will be converted into g/s-m^2 based on the source group's total area. For volume sources, the emission rate will be divided equally among the volume sources that make up each overall volume source group. The "Other" pollutant option will be selected.

4. HEALTH RISK ASSESSMENT METHODOLOGY

An HRA will be conducted in accordance with the Air District's Section 2-5 Health Risk Assessment Guidelines. Section 2-5 Health Risk Assessment Guidelines follow the Health Risk Assessment Guidelines adopted by Cal/EPA's OEHHA for use in the Air Toxics Hot Spots Program. The HRA will evaluate the Project's local risks and hazards, which will include cancer risk, chronic hazard index and acute hazard index. The HRA will be conducted using the methodology explained in the following sections.

4.1.1 Receptor Types

The HRA and $PM_{2.5}$ AERMOD models will contain a 20-meter by 20-meter grid extending 1,000 meters in all directions from the facility center, as well as additional 20-meter by 20-meter buffer gridding. The receptor grid will be used to evaluate the project risk. The following three key receptor types will be evaluated:

- The Maximally Exposed Individual Worker (MEIW) will be the highest impacted receptor which best aligns with a workplace as modeled with worker exposure pathways and duration. **Table 4-3** lists the nearest worker areas to the Project area.
- The Maximally Exposed Individual Resident (MEIR) will be the highest impacted receptor which best aligns with a residence as modeled with resident exposure pathways and duration. **Table 4-2** lists the nearest residential areas to the Project area.
- Sensitive receptors, as listed in **Table 4-1**.

Sensitive receptors are considered locations with people who are more sensitive than the general public to the effects of air pollutants. The reasons for increased sensitivity include preexisting health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be sensitive receptors because children, the infirm, and elderly people are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are also considered sensitive to poor air quality because residents are often home for extended periods of time which results in greater exposure to ambient air quality; therefore, residential receptors are evaluated as a separate receptor type from sensitive receptors. **Table 4-1** lists the nearest sensitive receptors within 1,000 meters of the Project's property boundary.[7] The list includes sensitive receptors potentially impacted by acute health risks (e.g., a medical facility where a sick person may visit for a single check-up per year) as well as sensitive receptors potentially impacted by chronic health risks (e.g., a medical facility where a patient may need to stay for long-term in-patient care or a school where a student would attend every weekday for many years).

[7] The sensitive receptors were identified using Google Earth and Google Maps.

Table 4-1. Sensitive Receptors near the Project Area

ID	Name of Sensitive Receptor	Address of Sensitive Receptor	Type	Distance from Property Boundary to Sensitive Receptor [miles] [a]
1	Bayview Child Health Center	1337 Evans Ave, San Francisco, CA 94124	Healthcare Facility	0.49
2	Bayview Child Health Center	3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	Healthcare Facility	0.52
3	Foster Care Mental Health	3801 3rd St, San Francisco, CA 94124	Healthcare Facility	0.59
4	Angel Childcare for Infants	1591 Hudson Ave, San Francisco, CA 94124	Daycare	0.68

Source: Google Earth, 2025

Table 4-2. Residential Areas near the Project

ID	Distance from Property Boundary to Residential Area [miles]
RES 1	0.62-0.67
RES 2	0.62-0.64
RES 3	0.57-0.59
RES 4	0.61-0.66

Source: Google Earth, 2025

Table 4-3. Worker Areas near the Project

ID	Distance from Property Boundary to Worker Area [meters]
WRK 1	150 - 715
WRK 2	310 - 975
WRK 3	430 - 930
WRK 4	445 - 945

Source: Google Earth, 2025

Figure 4-1 identifies the locations of the sensitive receptors and residential and worker areas listed in **Table 4-1**, **Table 4-2, and Table 4-3**.

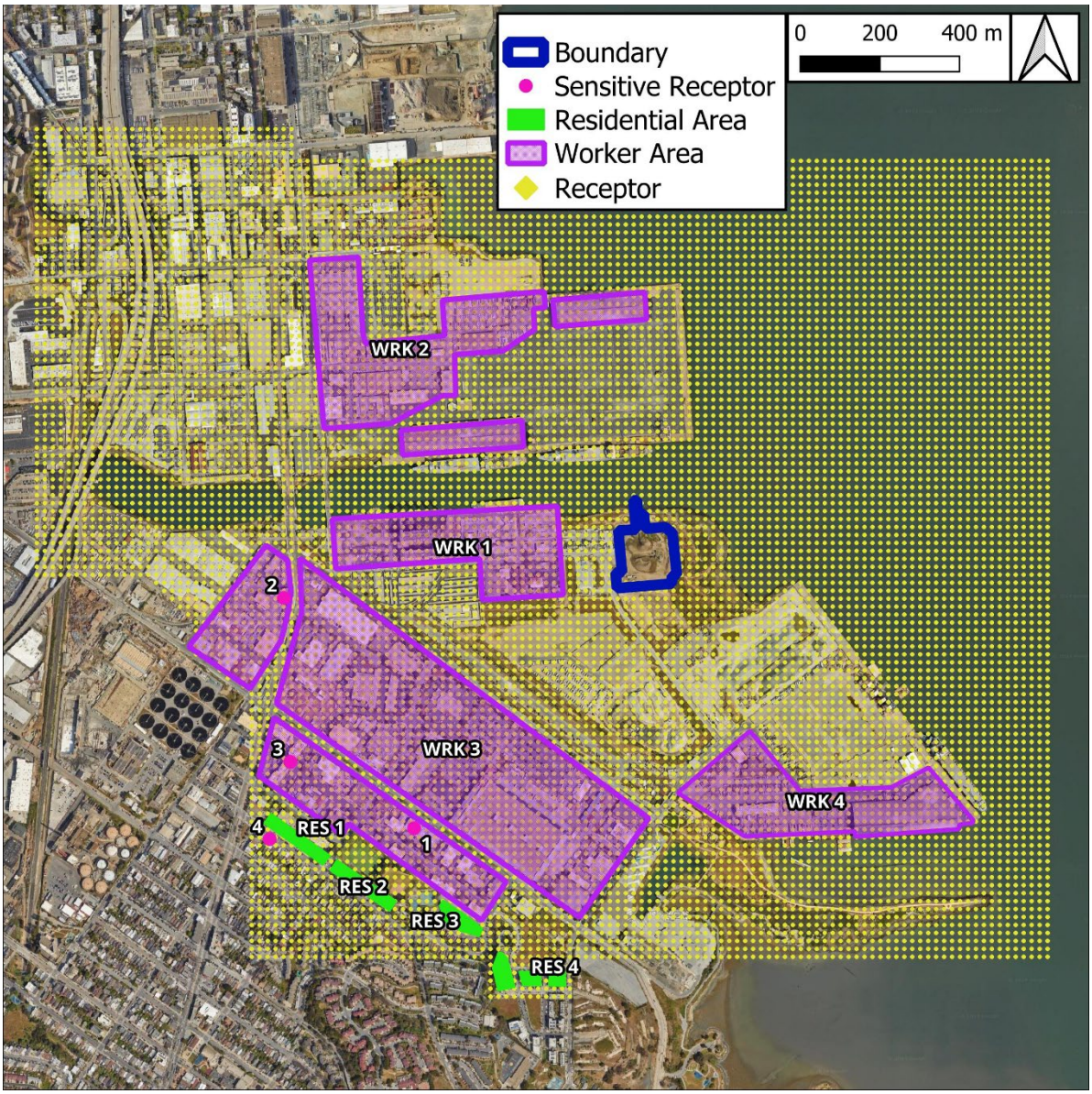


Figure 4-1. Location of Sensitive Receptors and Surrounding Residential and Worker Areas

The Project is not located within 1,000 feet of any school and thus a student scenario will not be evaluated as part of the HRA.

4.1.2 Exposure Pathways

Results from the HRA AERMOD air dispersion modeling will be combined with calculated hourly and annual TAC emission rates into the Hot Spots Analysis and Reporting Program (HARP) to model risk and exposure. The calculated annual TAC emission rates for the construction phase will account for the length of the construction phase.

Exposure pathways are generally classified as primary pathways and secondary pathways. Inhalation is the primary exposure pathway for all modeled sources and substances. For multi-pathway substances, non-inhalation exposure pathways will also be evaluated. Cancer risks and chronic and acute hazard indices will

be considered for the analysis. Only operational acute hazard indices will be considered as the Project's construction phase is not anticipated to include TACs with acute health impacts.

Residential cancer risks and chronic and acute hazard indices will be evaluated for the following default exposure pathways: dermal absorption, soil ingestion (reflecting a 0.02 m/s deposition rate for particulate-controlled sources), and mother's milk. The residential cancer risk will use the "Risk Management Policy" (RMP) Method to determine the daily breathing rate by age group. Worker cancer risks and chronic hazard indices will be evaluated based on default worker multi-pathway exposure for the following exposure pathways: dermal absorption, soil ingestion (reflecting a 0.02 m/s deposition rate for particulate-controlled sources), and an 8-hour breathing rate with moderate intensity. The worker cancer risk will use the OEHHA Derived Method to determine the daily breathing rate. HARP default parameters will be used for numerical pathway inputs.

A majority of the emission sources modeled represent non-continuously emitting sources, such as the off-road equipment and transfer truck dust and exhaust emissions which occur only during operating hours. The AERMOD model is set up to calculate normalized, long-term average concentrations as if the emission sources operate continuously. AERMOD's normalized, long-term average concentrations therefore include hours when zero emissions actually occur. However, off-site workers' operating schedules are expected to overlap with Project's operational schedule, meaning their exposure during the workday does not include any hours where zero emissions occur. To correct this, a Worker Adjustment Factor (WAF) is applied as consistent with the OEHHA Risk Assessment Guidelines equation 4.1, and reproduced below.

$$WAF = \frac{H_{residential}}{H_{source}} \times \frac{D_{residential}}{D_{source}} \times DF$$

Where:
WAF = worker adjustment factor
$H_{residential}$ = number of hours the long-term residential concentration is based on (24 hours)
H_{source} = number of hours the source operates
$D_{residential}$ = number of days per week the long-term residential concentration is based on (7 days)
D_{source} = the number of days the source operates per week.
DF = discount factor applied if the offsite worker's schedule partially overlaps with the source's operating schedule. For the Project, it is assumed that the sources' operating schedules will fully overlap with the offsite worker's schedule, thus the DF is 1 for the Project.

For the construction phase, a 4.2 WAF will be applied assuming that construction operations will occur for 8 hours per day and 5 days per week. For the baseline scenario, the actual operating schedule of 9 hours per day and 5 days per week is applied, which results in a WAF of 3.7. For the project scenario, the projected operating schedule of 12 hours per day and 5 days per week is applied, which results in a WAF of 2.8. The healthcare patients and daycare children are also assumed to be at their locations during the Project's operating hours, thus the WAF is also applied for those scenarios.

4.1.3 Exposure Duration

4.1.3.1 Construction Phase

The construction phase is considered a short-term, one-time event. To account for the brief nature of the construction phase, the User Defined (Tier 2) option will be applied in HARP. Exposure is assumed to begin at the third trimester of pregnancy and exposure duration is equal to the duration of the construction phase,

which is anticipated to last up to 7 months. Construction phase exposure parameters are listed in **Table 4-4**.

Table 4-4. Construction Phase Exposure Parameters

Population	Receptor Age Group	Daily Breathing Rate (L/kg-day)[a]	Exposure Duration (years)[b]	Fraction of Time at Home[c]	Exposure Frequency (days/year)[d]	Averaging Time (days)[e]	Age Sensitivity Factor[f]
Worker	16 to 70	230	0.584	-	153	25,550	1
Resident	3rd Trimester	361	0.25	1.0	213	25,550	10
	0 < 2	1,090	0.584	1.0	213	25,550	10
	2 < 16	572	0.584	1.0	213	25,550	3
	16 < 30	261	0.584	0.73	213	25,550	1
Healthcare Patients[g]	0 < 2	1,090	0.584	1.0	153	25,550	10
	2 < 16	572	0.584	1.0	153	25,550	3
Daycare Children	6 weeks < 2	1,090	0.584	1.0	153	25,550	10
	2 < 9	631	0.584	1.0	153	25,550	3

a. Daily breathing rate (L/kg-day) per OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA, 2015) and the Air District's Air Toxics NSR Program HRA Guidelines (Air District, 2016). For the worker population, the 95th percentile 8-hour breathing rate based on moderate activity will be used. For the resident and sensitive populations, the 95th percentile breathing rates will be used for age groups less than 2 years old and the 80th percentile breathing rates will be used for age groups greater than or equal to 2 years old.
b. Exposure Duration is equal to the duration of the construction phase except for the 3rd trimester age group, which is equal to 3 months (0.25 years), per OEHHA Air Toxics Hot Spots Program Guidance Manual and recommendations (OEHHA, 2015). The construction phase is anticipated to last up to 7 months, which rounded up is 0.584 years.
c. The fraction of time spent at home is conservatively assumed to be 1 (i.e. 24 hours/day) for age groups from 3rd trimester to less than 16 years old and 0.73 for adults aged 16-30 per the Air District's Air Toxics NSR Program HRA Guidelines (Air District, 2016). The fraction of time at home for daycare children and healthcare patients was conservatively set to 1 per OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA, 2015).
d. Exposure frequencies per OEHHA Air Toxics Hot Spots Program Guidance Manual recommendations (OEHHA, 2015). The exposure frequency for residents is equal to the duration of the construction phase, 7 months (213 days). The exposure frequency for workers assumes 5 working days per week for 7 months, about 30.42 weeks. The exposure frequency for daycare children and healthcare patients assumes 5 days per week for 7 months.
e. Averaging time for lifetime exposure, 70 years.
f. Age Sensitivity Factor per Table 8.3 of OEHHA Air Toxics Hot Spots Program Guidance Manual (OEHHA, 2015).
g. Healthcare facilities near the project site listed in **Table 4-1** are for children. Therefore, the receptor age group was limited to 0 to 16 years of age.

4.1.3.2 Operation Phase

Consistent with Air District HRA Modeling Protocol, residential receptor exposure is assumed to begin prior to birth (during the third trimester of pregnancy) and continue for 30 years while worker exposure is assumed to begin at age 16 and continue for 25 years (Air District, 2020). Sensitive receptor exposure duration will be 16 years for healthcare patients and 5.9 years (rounded up to 6 years) for daycare children. For the residential scenario, the default fraction of time at residence for age bins greater than or equal to 16 years will be applied to account for adults spending a portion of the day away from their residence. Operation phase exposure parameters are listed in **Table 4-5.**

Table 4-5. Operation Phase Exposure Parameters[a]

Population	Receptor Age Group	Daily Breathing Rate (L/kg-day)	Exposure Duration (years)[b]	Fraction of Time at Home	Exposure Frequency (days/year)[b]	Averaging Time (days)	Age Sensitivity Factor
Worker	16 to 70	230	25	-	254 (Baseline)/ 262 (Project)	25,550	1
Resident	3rd Trimester	361	0.25	1.0	350	25,550	10
	0 < 2	1,090	2	1.0	350	25,550	10
	2 < 16	572	14	1.0	350	25,550	3
	16 < 30	261	14	0.73	350	25,550	1
Healthcare Patients	0 < 2	1,090	2	1.0	180	25,550	10
	2 < 16	572	14	1.0	180	25,550	3
Daycare Children	6 weeks < 2	1,090	1.9	1.0	180	25,550	10
	2 < 9	631	4.0	1.0	180	25,550	3

a. The receptor age group, daily breathing rate (L/kg-day), fraction of time at home, averaging time, and age sensitivity factor will be equal to parameters listed in **Table 4-4**.

b. Exposure duration and frequency for residents, healthcare patients, and daycare children are per OEHHA Air Toxics Hot Spots Program Guidance Manual and recommendations (OEHHA, 2015). The worker exposure frequency is adjusted to reflect the number of operating days per year for the Baseline and Project as provided by EP.

4.1.4 Net Project Analysis

The Facility will continue to operate during construction; therefore, the Project health risk impact will be equal to the sum of the construction phase and operation phase health risk. The HRA results from the Baseline Period will be subtracted from the Project period results to determine the Project's net health risk impact. The net health risk impact results will be analyzed in the environmental document to determine if the Project results in a significant health risk. The Citywide HRA Health Risk Significance Thresholds developed in collaboration with San Francisco Planning Department, San Francisco Department of Public Health, and the Air District will be used to determine the Project's significance. The Project is located within a Health Vulnerable zip code and the air pollutant exposure zone (San Francisco Planning Department, 2025). Therefore, the existing impacts and net project impacts will be compared to the applicable air pollutant exposure zone criteria for determining the applicable significance scenario.

4.1.5 Cumulative Analysis

The Cumulative HRA and annual average $PM_{2.5}$ modeling (the Cumulative Analysis) will assess the combined impacts from the Project's operation and construction phase, present and foreseeable projects, and existing stationary sources using the Citywide HRA results. The Cumulative Analysis will be compared to the San Francisco Planning Department Air Quality Health Risk Thresholds. The Project's operation phase encompasses existing impacts and the potential impacts from projected operations. Present and foreseeable projects will be determined in consultation with EP to determine which projects, if any, will affect the identified MEIR and MEIW from the Project. If such projects have published HRA or CEQA Air Quality Reports, the project-specific results will conservatively be applied to the Cumulative Analysis. The cancer risk, chronic hazard index, and ambient $PM_{2.5}$ concentrations from stationary sources within 1,000 feet of the Project and from roadway and railway impacts will be determined using the San Francisco Air Pollutant Exposure Zone modeling results. The Cumulative Analysis will incorporate quantitative analysis if

quantitative data is available. If no quantitative information is available for cumulative projects, the Cumulative Analysis will be qualitative.

5. REFERENCES

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APPENDIX A. EMISSION CALCULATION INPUTS

Table A-1. Construction - Asphalt Paving - Emission Factors

Pollutant	Emission Factor (lb/acre)	Notes
ROG	2.62	CalEEMod refers to Sacramento Metropolitan Air Quality Management District's 1994 Air Quality Thresholds of Significance, First Edition.

Table A-2. Construction - Excavation Activity - Emission Factors and VMT

PM_{10} and $PM_{2.5}$ EF Formula	$EF_{TSP} = \frac{C_{TSP} \times (S^{1.2})}{M^{1.3}}$ $EF_{PM15} = \frac{C_{PM15} \times (S^{1.5})}{M^{1.4}}$ $EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$ $EF_{PM10} = EF_{PM15} \times F_{PM10}$
	EF = Emission factor, (lb/hr) CalEEMod refers to formula in AP-42 Chapter 11.9, Table 11.9-1, for "Bulldozing, Overburden".
	C = arbitrary coefficient used by AP-42 C_{TSP} = 5.7 C_{PM15} = 1
	s = Material silt content (%). Material silt content per Facility specification. If information is not available, default of 6.9% is applied, consistent with CalEEMod Section 4.4.2.
	$F_{PM2.5}$ = $PM_{2.5}$ scaling factor. The AP-42 default value is 0.105 (Chapter 11.9, Table 11.9-1).
	F_{PM10} = PM_{10} scaling factor. The AP-42 default value is 0.75 (Chapter 11.9, Table 11.9-1).
	M = Material moisture content (%). Moisture content per Facility specification. If information is not available, default of 7.9% is used, consistent with CalEEMod Section 4.4.2.

Table A-3. Constructions - Grading Above Grade - Emission Factors and VMT

PM_{10} and $PM_{2.5}$ EF Formula	$EF_{TSP} = 0.04 * (S^{2.5})$ $EF_{PM15} = 0.051 * (S^{2.0})$ $EF_{PM2.5} = EF_{TSP} \times F_{PM2.5}$ $EF_{PM10} = EF_{PM15} \times F_{PM10}$
	EF = Emission factor, (lb/VMT) CalEEMod refers to formula in AP-42 Chapter 11.9, Table 11.9-1, for "Grading".
	S = mean vehicle speed, mph. The AP-42 default value is 7.1 mph (Chapter 11.9, Table 11.9-1).
	$F_{PM2.5}$ = $PM_{2.5}$ scaling factor. The AP-42 default value is 0.031 (Chapter 11.9, Table 11.9-1).
	F_{PM10} = PM_{10} scaling factor. The AP-42 default value is 0.6 (Chapter 11.9, Table 11.9-1).
VMT Formula	$VMT = \frac{A_s}{W_b} \times \frac{43{,}560\ (\frac{sqft}{acre})}{5{,}280\ (\frac{ft}{mile})}$
	VMT = vehicle miles traveled, (mile/year)
	A_s = acreage of the grading site, (acre/yr). 1.5 acres of grading area per Project Sponsor.
	W_b = blade width of the grading equipment, (ft) If blade width information is not available, default blade width of 12 ft will be used per CalEEMod Appendix C, Section 4.4.1.

Table A-4. Construction - Off-Road Equipment Exhaust - Emission Factors

Type	Equipment	Quantity [1]	Construction Schedule [1]		Default HP [2]	Default Load Factor [2]	Emission Factors (g/bhp-hr) [3]			
			Hour/Day	Total Construction Days			PM_{10}	$PM_{2.5}$	NO_x	ROG
Aerial Lifts (25 - 50 hp)	Man Lift	1	8	40	46	0.31	0.020	0.019	2.870	0.151
Cranes (300 - 600 hp)	Crane	1	8	40	367	0.29	0.072	0.066	1.748	0.195
Forklifts (75 - 100 hp)	Gradall Forklift	1	8	140	82	0.2	0.092	0.085	2.152	0.228
Paver (75 - 100 hp)	Paver	1	8	15	81	0.42	0.119	0.110	2.450	0.229
Off-Highway Trucks (300 - 600 hp)	Water Truck	1	8	15	376	0.38	0.034	0.031	0.965	0.176
Tractors/Loaders/Backhoes (75 - 100 hp)	Bobcat	1	8	15	84	0.37	0.054	0.050	1.807	0.177
Rollers (25 - 50 hp)	Sheepsfoot Compactor	1	8	15	36	0.38	0.146	0.134	3.577	0.529
Rollers (25 - 50 hp)	Vibratory Drum Roller	1	8	30	36	0.38	0.146	0.134	3.577	0.529
Graders (100 - 175 hp)	Motor Grader	1	8	20	148	0.41	0.127	0.117	2.284	0.295

1. Off-Road equipment quantities and construction schedule were provided by EP on 7/31/2025, based off information provided by the Project Sponsor.
2. Default HP and load factor based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type.
3. Default Emission Factors for horsepower and 2027 construction year from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Assumes diesel-fueled equipment. Per CalEEMod User Guide Appendix C, these emission factors are based upon the calendar year specified in EMFAC.

Table A-5. Construction - On-Road Vehicle Emissions - Emission Factors

Vehicle Type		Non-Adjusted Emission Factors			
		PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	Running (g/mi) [1]	1.30E-01	4.97E-02	8.49E-01	1.22E-02
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	2.89E+00	0.00E+00
Heavy Duty Trucks (Asphalt Delivery)	Running (g/mi) [1]	1.30E-01	4.97E-02	8.49E-01	1.22E-02
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	2.89E+00	0.00E+00
Heavy Duty Trucks (Base Underlay Delivery)	Running (g/mi) [1]	1.30E-01	4.97E-02	8.49E-01	1.22E-02
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	2.89E+00	0.00E+00
Construction Worker Trucks	Running (g/mi) [3]	2.39E-02	1.22E-02	6.50E-02	2.79E-02
	Start-Up (g/trip) [4]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soil Haul Trucks	Running (g/mi) [5]	1.29E-01	4.91E-02	8.69E-01	1.08E-02
	Start-Up (g/trip) [6]	0.00E+00	0.00E+00	2.91E+00	0.00E+00

Vehicle Type		Adjustment Factor [7]			
		PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	T7 Single Other Class 8	1.030770355	1.029718034	1.056899163	1.022120531
Heavy Duty Trucks (Asphalt Delivery)	T7 Single Other Class 8	1.030770355	1.029718034	1.056899163	1.022120531
Heavy Duty Trucks (Base Underlay Delivery)	T7 Single Other Class 8	1.030770355	1.029718034	1.056899163	1.022120531
Construction Worker Trucks	LDT2	1	1	1	1
Soil Haul Trucks	T7 Single Dump Class 8	1.029507979	1.02758622	1.048645743	1.018793286

Vehicle Type			Adjusted Emission Factors [8]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	T7 Single Other Class 8	Running (g/mi)	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Heavy Duty Trucks (Asphalt Delivery)	T7 Single Other Class 8	Running (g/mi)	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Heavy Duty Trucks (Base Underlay Delivery)	T7 Single Other Class 8	Running (g/mi)	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Construction Worker Trucks	LDT2	Running (g/mi)	2.39E-02	1.22E-02	6.50E-02	2.79E-02
	LDT2	Start-Up (g/trip)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soil Haul Trucks	T7 Single Dump Class 8	Running (g/mi)	1.33E-01	5.05E-02	9.12E-01	1.10E-02
	T7 Single Dump Class 8	Start-Up (g/trip)	0.00E+00	0.00E+00	3.05E+00	0.00E+00

1. Heavy Duty Trucks (Equipment/Delivery, Asphalt Delivery, and Base Underlay Delivery) emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Other Class 8 for RUNEX, PMTW, and PMBW.

2. Heavy Duty Trucks (Equipment/Delivery, Asphalt Delivery, and Base Underlay Delivery) emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Other Class 8 for STREX.

3. Construction Worker Trucks emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category LDT2 for RUNEX, PMTW, and PMBW.

4. Construction Worker Trucks emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category LDT2 for STREX.

5. Soil Haul Trucks emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW.

6. Soil Haul Trucks emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for STREX.

7. Adjustment factors per Appendix A - EMFAC2021 Adjustment Factors (October 2025) for each respective vehicle type in year 2027.

8. Adjusted Emission Factors = Non-Adjusted Emission Factors * Adjustment Factors.

Table A-6. Construction - On-Road Vehicle Emissions - Vehicle Miles Traveled

Vehicle Type	Total Trips in Construction Period [1, 2, 3, 4, 5]	Trip Length (mi/trip) [6]	Annual VMT (mi/yr) [7]
Heavy Duty Trucks (Equipment/Deliveries)	18	5.64	101.5
Heavy Duty Trucks (Asphalt Delivery)	248	14.1	3,496.8
Heavy Duty Trucks (Base Underlay Delivery)	410	4.9	2,009.0
Construction Worker Trucks	1,400	12.26	17,164.0
Soil Haul Trucks	414	5.64	2,335.0

1. Total Trips in Construction Period (Equipment Delivery Trucks) is assumed to be twice the number of the construction equipment units, accounting for delivery and removal of equipment from the site. It is assumed that one heavy duty truck will be used to deliver each construction equipment and the equipment will stay on site until construction completes.

2. Total Trips in Construction Period (Asphalt Delivery Trucks) = Asphalt Required (tons) / Delivery Truck Capacity (tons/truck) x 2. Per the project description, approximately 63,330 square feet of area will be paved with asphalt. Assuming 0.039 tons of asphalt is required per square foot, 2,470 tons of asphalt is required. Each haul truck's capacity is assumed to be 20 tons/truck. It is assumed that two trips will be required to account for delivery and return to the asphalt pickup location. Therefore, 248 round trips are required.

3. Total Trips in Construction Period (Base Underlay Trucks) = Base Underlay Required (tons) / Delivery Truck Capacity (tons/truck) x 2. Per the project description, approximately 63,330 square feet of area will require base underlay. Assuming 0.0645 tons of base underlay is required per square foot, 4,085 tons of base underlay is required. Each haul truck's capacity is assumed to be 20 tons/truck. It is assumed that two trips will be required to account for delivery and return to the base underlay pickup location. Therefore, 410 round trips are required.

4. Total Trips in Construction Period (Worker Trucks) = Total Trips per Day (trips/day) x Construction Period (days). Total trips per day is assumed to be 10 trips per day and construction period is 140 days provided by Martin Marietta (5 days per week x 28 weeks).

5. Total Trips in Construction Period (Soil Haul Trucks) = Soil Excavated During Construction (cubic yards) / Haul Truck Capacity (cubic yards/truck) x 2. Per the project description, approximately 3,305 cubic yards of soil will be removed. Each haul truck's capacity is 16 cubic yards, per CalEEMod v2022.1 User Guide, Section 4.6.1. It is assumed that two trips will be required to account for delivery and return to the base underlay pickup location.

6. Default miles per trip from CalEEMod 2022.1 User Guide Appendix G, Table G-15, *2015 California Statewide Travel Demand Model Trip Lengths and Purpose Splits by Trip Type (Aggregated by Analysis Level)* , San Francisco Bay Area, Nonresidential Trip Length, Other-Other (Equipment/delivery trucks and soil haul trucks) and Home-Work (Construction Worker Trucks). Trip length for asphalt delivery trucks and base underlay trucks per project information.

7. Annual VMT (mi/yr) = Total Trips in Construction Period (trips/period) * Trip Length (mi/trip).

Table A-7. Construction - Fugitive Road Dust Emissions

Paved Roads
PM_{10} and $PM_{2.5}$ Emission Factor Formula

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

AP-42 Chapter 13.2.1 (updated January 2011) Equation 2

E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1
$sL_{\text{Equipment Delivery Truck}}$ =	0.020		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway. The remainder of distance traveled by the construction on-road vehicles are represented using the Freeway silt loading.
$sL_{\text{Asphalt Delivery Truck}}$ =	0.017		
$sL_{\text{Base Underlay Truck}}$ =	0.020		
$sL_{\text{Construction Worker Truck}}$ =	0.017		
$sL_{\text{Soil Haul Truck}}$ =	0.020		

Segment	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Freeway (Equipment Delivery Trucks)	23,601	0.015	Distance is the difference between Off-Site Travel Distance and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines, Appendix E*, Table 22 for Freeways.
Freeway (Asphalt Delivery Trucks)	68,270	0.015	
Freeway (Base Underlay Delivery Trucks)	19,694	0.015	
Freeway (Construction Worker Trucks)	58,555	0.015	
Freeway (Soil Haul Trucks)	23,601	0.015	

W = 2.4 — Mean vehicle weight (tons) on paved roadway, per default from CalEEMod, Appendix C, Section 5.1.4.

P = 65 — Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.

N = 365 — Number of days in the averaging period

VMT, Trip Length, and Max No. of Annual Trips

Refer to Table A-6 of Appendix A.

Table A-8. Operational - Material Transfer Points - Emission Factors

Pollutant	Emission Factor (lb/ton)	Notes
PM_{10}	9.90E-04	PM_{10} emission factor for sand transfer per AP-42, Chapter 11.12 Concrete Batching, Table 11.12-2.
$PM_{2.5}$	1.49E-04	$PM_{2.5}$ emission factor per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM10 emissions.
Crystalline Silica	1.02E-04	Crystalline silica emission factor = PM_{10} emission factor x Site-specific respirable crystalline silica weight percent. Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM_4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The site-specific bulk material crystalline silica (wt %): 30.6% Resultant respirable crystalline silica emission factor (wt %): 10.3%

Table A-9. Operational - Stockpiles - Emission Factors

PM_{10} and $PM_{2.5}$ Emission Factor Formula	$E_{TSP} = (1.7)\left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right)$ (lb/acre-day)			Equation 4-9 from Control of Open Fugitive Dust Sources (EPA-450/3-88-008, September 1988)
		E_{TSP} = Total Suspended Solids emission factor, lb/acre/day		
		s=	1.58	Silt content of sand (%). Material passing the 200 mesh: average 0.5% and range of 0.2-1.58%.
		p=	65	Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.2-1.
		f=	13.3	Percentage of time that the unobstructed wind speed exceeds 12 mph at the Raw Material Stockpile is based on Mojave Desert Air Quality Management District (MDAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries, Wind Erosion from Stockpiles section. Used for baseline (raw material, oversized, and product) and Project (raw material and oversized).
		f=	1.0	Percentage of time that the unobstructed wind speed exceeds 12 mph at the Product Stockpile is estimated to be at 1%. The enclosure for the Product Stockpile is only open on the North and South ends and partially enclosed otherwise. Used only for Project (product).
		PM_{10}=	$0.5*E_{TSP}$	
		$PM_{2.5}$=	$0.15*PM_{10}$	Per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM_{10} emissions.
Crystalline Silica EF	10.3% x PM_{10} Emission Factor	Crystalline silica emission factor = PM10 emission factor x Site-specific respirable crystalline silica weight percent. Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California". The site-specific bulk material crystalline silica (wt %): 30.6% Resultant respirable crystalline silica emission factor (wt %): 10.3%			

Table A-10. Operational - Fugitive Road Dust - Emission Factors

Unpaved Roads
PM_{10} and $PM_{2.5}$ Emission Factor Formula

$$E = k(\frac{s}{12})^a \times (\frac{W}{3})^b$$

AP-42 Chapter 13.2.2 (updated November 2006) Equation 1a

E= Size-specific emission factor (lb/VMT)

$s_{front\ loader}$= 7.1 — Surface material silt content (%) for sand and gravel processing (material storage area mean)

$s_{customer\ truck}$= 4.8 — Surface material silt content (%) for sand and gravel processing (plant road mean)

a,b,k= Constants per Table 13.2.2-2 for industrial roads

	PM_{10}	$PM_{2.5}$
k =	1.5	0.15
a =	0.9	0.9
b =	0.45	0.45

W= Mean vehicle weight (tons)

Paved Roads
PM_{10} and $PM_{2.5}$ Emission Factor Formula

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

AP-42 Chapter 13.2.1 (updated January 2011) Equation 2

E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1

$sL_{within\ Facility\ boundary}$= 12 — Road surface silt loading (g/m^2) for Concrete Batching Facility (AP-42 Chapter 13.2.1)

$sL_{outside\ Facility\ boundary,\ emissions}$= 0.031 — Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway.

$sL_{outside\ Facility\ boundary,\ Modeling\ -\ Off\ Site\ Locations}$= 0.038 — Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below, excluding travel on Freeways.

$sL_{outside\ Facility\ boundary,\ Modeling\ -\ Adjacent\ Plants}$= 0.116 — Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street (North/South and East/West bound). The distance traveled on the East/West bound segment of Amador street is 635 feet as measured in Google Earth.

Segment	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
Freeway	2,798	0.015	Distance is the difference between Off-Site Travel Distance (Emissions) and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines, Appendix E*, Table 22 for Freeways.

W = Mean vehicle weight (tons). Note that actual vehicle weight for customer truck travel outside the facility boundary was conservatively used in lieu of the CalEEMod default vehicle weight of 2.4 tons.

P = 65 — Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.

N = 365 — Number of days in the averaging period

VMT, Trip Length, and Max No. of Annual Trips

$$VMT\left(\frac{mi}{yr}\right) = Trip\ Length\ (mi/trip)\ x\ Maximum\ Number\ of\ Annual\ Trips(trip/yr)$$

Trip Length (miles) = Vehicle distance traveled as estimated in Google Earth.

	Baseline Value (ft)	Project Value (ft)	
Unpaved Road Front Loader Path =	120	50	
Paved Road Front Loader Path =	0	150	
Unpaved Road Customer Trucks Path =	745	--	
Paved Road Customer Trucks Path =	215	775	Inside Facility
Paved Road Customer Trucks Path (Project Emissions) =	8,976	8,976	Outside Facility [1]
Paved Road Customer Trucks Path (to Freeway) =	6,178	6,178	Outside Facility [2]
Paved Road Customer Trucks Path (to Adjacent Plants) =	898	898	Outside Facility [2]

1. Values per weighted average trip length (concrete plants + other off-site locations/direct deliveries) provided by the Transportation Analysis for baseline and Project Average are used for emission calculation.

2. For air dispersion modeling purposes, the trip lengths outside the Facility boundary are the distance between the Facility to the nearest interstate, reflecting other off-site delivery locations, and the distance between the Facility and the CEMEX main entrance driveway, reflecting the adjacent concrete plants.

Maximum No. of Annual Trips = Baseline Annual Trips are based on the actual trips during Baseline Period (Jan 1, 2020 - Dec 31, 2024) provided by EP divided by 5 years, which is 70,954 trips/5 yr. Project maximum annual trips are estimated by dividing the annual throughput values by the vehicle capacity.

Baseline Truck Trips (Within Facility Boundary) =	14,191	customer truck trips/yr	Inside Facility [3]
Baseline Truck Trips (Outside Facility Boundary) =	28,382	customer truck trips/yr	Outside Facility [3]
Baseline Truck Trips (Outside Facility Boundary, to Freeway) =	9,934	customer truck trips/yr	Outside Facility [4]
Baseline Truck Trips (Outside Facility Boundary, to Adjacent Plants) =	18,448	customer truck trips/yr	Outside Facility [4]
Project Truck Trips (Within Facility Boundary) =	40,000	customer truck trips/yr	Inside Facility [3]
Project Truck Trips (Outside Facility Boundary) =	80,000	customer truck trips/yr	Outside Facility [3]
Project Truck Trips (Outside Facility Boundary, to Freeway) =	28,000	customer truck trips/yr	Outside Facility [4]
Project Truck Trips (Outside Facility Boundary, to Adjacent Plants) =	52,000	customer truck trips/yr	Outside Facility [4]
Front Loader Capacity =	22,000	lb	
Customer Trucks Capacity =	40,000	lb	

3. Customer truck trip within the Facility boundary is one-way only. Customer truck trip outside the Facility boundary is multiplied by 2 to account for travel to/from the site.

4. Trip ratios to off-site locations (35%) and adjacent plants (65%) are based on the Transportation Analysis for Baseline and Project Average.

	Pollutant	TAC Speciation (wt %) [1]	Vehicle Type
TAC Speciations	Hexavalent chromium	0.00000018	Loader
	Mercury	0.000000017	Loader
	Arsenic	0.0000073	Loader
	Beryllium	0.000000043	Loader
	Cadmium	0.00000004	Loader
	Cobalt	0.000006	Loader
	Copper	0.0000046	Loader
	Lead	0.0000038	Loader
	Nickel	0.00004	Loader
	Selenium	0.000000105	Loader
	Vanadium	0.000026	Loader
	Crystalline Silica	0.272976052	Loader
	Benzene	0.00000024	Loader
	Toluene	0.00000024	Loader
	Ethylbenzene	0.00000024	Loader
	Xylenes	0.00000024	Loader
	Naphthalene	0.0000094	Loader
	Hexavalent chromium	0.00000014	Truck
	Mercury	5.5E-09	Truck
	Arsenic	0.00001	Truck
	Beryllium	0.00000013	Truck
	Cadmium	0.00000004	Truck
	Cobalt	0.0000069	Truck
	Copper	0.0000066	Truck
	Lead	0.0000036	Truck
	Nickel	0.000045	Truck
	Selenium	0.000000105	Truck
	Vanadium	0.000031	Truck
	Crystalline Silica	0.272976052	Truck
	Benzene	0.00000064	Truck
	Toluene	0.00000064	Truck
	Ethylbenzene	0.00000064	Truck
	Xylenes	0.00000064	Truck
	Naphthalene	0.000028	Truck
	1. TAC speciation percentages are from site-specific analytical sampling taken August 1, 2024.		

Table A-11. Operational - Barge and Tugboats - Emission Factors

Engine	Engine Power		Emission Factors [1]		
	Total Power (bhp)	Load (%)	$PM_{10}/PM_{2.5}$ (g/bhp-hr)	NO_x (g/bhp-hr)	ROG (g/bhp-hr)
Tugboat - Main Engine	2,400	30	0.05	3.54	0.19
Tugboat - Generator Engine	198	60	0.07	3.40	0.18
Barge - Main Engine	1,750	60	0.03	3.97	0.21
Barge - Generator Engine	257	60	0.04	3.51	0.12
Barge - Bow Thruster Engine	375	60	0.05	3.65	0.11

1. NOx, ROG, PM10/PM2.5 emission factors per EPA's Marine Compression-Ignition (CI) Engines certification database. EPA's Marine CI database provided a NOx + NMHC emission factor for the main engine which is assumed to be 95% NOx and 5% VOC based on the BAAQMD's policy, CARB Emission Factors for CI Diesel Engines (effective June 28, 2004).

Table A-12. Operational - Barge and Tugboats - Specifications and Annual Operating Time

Parameter	Tugboat - Main Engine	Tugboat - Generator Engine	Barge - Main Engine	Barge - Generator Engine	Barge - Bow Thruster Engine
Model	Caterpillar C32	John Deere Powertech 4045TFM85	Caterpillar 3512C	Caterpillar C7.1	Caterpillar C9.3
Engine Family Name	FCPXN32.1EP3	FJDXN04.5146	ECPXN78.1AT3	GPKXN07.0BP1	GCPXN09.3EB3
Engine Power (bhp)	1,200	99	1,750	257	375
Engines per vessel	2	2	1	1	1
Operating time per trip (each) (hr/trip) [1]	2.5	8	4	24	1
Barge Capacity (tons/trip)	3,250				
Baseline Max Throughput (tons/yr) [2]	349,078				
Baseline Max Annual Barge Trips (trips/yr) [3]	110				
Project Max Throughput (tons/yr) [2]	800,000				
Project Max Annual Barge Trips (trips/yr) [3]	250				
Baseline Operating time per year (each) (hr/yr) [1]	275	880	440	8,760	110
Project Operating time per year (each) (hr/yr) [1]	625	2,000	1,000	8,760	250

1. The tugboat main engines operate for the 1.25 hour journey between the sand mine and Pier 92, for a round-trip time of 2.5 hours per trip.
A tugboat generator engine operates 8 hours per trip. When not in use, the tugboat will be on shore power.
The barge main engine operates for 4 hours during each unloading process.
The barge generator engine operates continuously. A maximum operation of 365 days per year is reflected.
The barge bow thruster engine operates during the maneuvering process into and out of the pier unloading position for approximately 30 minutes to 1 hour (total) per trip.
2. Project Max Throughput per ATC Application
3. Project Max Annual Barge Trips (trips/year) = Project Max Throughput (tons/year) / Barge Capacity (tons/trip).

Table A-13. Operational - Off-Road Equipment - Emission Factors

Type	Equipment	HP [1]	Default Load Factor [2]	Year	Emission Factors (g/bhp-hr) [3]			
					PM_{10}	$PM_{2.5}$	NO_x	ROG
Rubber Tired Loader (300 - 600 bhp)	Rubber Tired Loaders	350	0.36	2020 - Baseline	0.118	0.109	3.146	0.302
				2021 - Baseline	0.099	0.091	2.630	0.266
				2022 - Baseline	0.086	0.079	2.277	0.244
				2023 - Baseline	0.074	0.068	1.966	0.225
				2024 - Baseline	0.068	0.063	1.796	0.219
				Average - Baseline	**0.089**	**0.082**	**2.363**	**0.251**
				2027 - Project	**0.046**	**0.042**	**1.203**	**0.188**
Off-Highway Trucks (100 - 175 bhp)	Water Truck	150	0.38	2020 - Baseline	0.140	0.129	2.668	0.315
				2021 - Baseline	0.116	0.107	2.289	0.284
				2022 - Baseline	0.091	0.084	1.856	0.246
				2023 - Baseline	0.085	0.078	1.736	0.242
				2024 - Baseline	0.073	0.067	1.542	0.229
				Average - Baseline	**0.101**	**0.093**	**2.018**	**0.263**
				2027 - Project	**0.053**	**0.049**	**1.062**	**0.194**
Forklifts (75 - 100 bhp)	Forklifts	82	0.2	2020 - Baseline	0.302	0.278	4.067	0.450
				2021 - Baseline	0.261	0.240	3.683	0.402
				2022 - Baseline	0.216	0.199	3.285	0.352
				2023 - Baseline	0.182	0.168	2.981	0.316
				2024 - Baseline	0.157	0.145	2.751	0.292
				Average - Baseline	**0.224**	**0.206**	**3.353**	**0.362**
				2027 - Project	**0.092**	**0.085**	**2.152**	**0.228**
Aerial Lifts (25 - 50 bhp)	Man Basket	46	0.31	2020 - Baseline	0.031	0.028	2.953	0.167
				2021 - Baseline	0.027	0.024	2.920	0.165
				2022 - Baseline	0.024	0.022	2.905	0.162
				2023 - Baseline	0.023	0.021	2.895	0.162
				2024 - Baseline	0.022	0.020	2.886	0.158
				Average - Baseline	**0.025**	**0.023**	**2.912**	**0.163**
				2027 - Project	**0.020**	**0.019**	**2.870**	**0.151**
Tractors/Loaders/Backhoes (50 - 75 bhp)	Bobcat	75	0.37	2020 - Baseline	1.013	0.932	12.627	1.608
				2021 - Baseline	1.015	0.934	12.678	1.615
				2022 - Baseline	1.010	0.929	12.477	1.590
				2023 - Baseline	1.009	0.928	12.404	1.582
				2024 - Baseline	1.025	0.943	12.795	1.630
				Average - Baseline	**1.014**	**0.933**	**12.596**	**1.605**
				2027 - Project	**1.002**	**0.922**	**12.173**	**1.556**

1. HP for rubber tired loader, water truck and bobcat are based on actual equipment specifications provided by Martin Marietta. Default HP for forklifts and man basket are based on CalEEMod 2021.1 User Guide Appendix G, Table G-12,*Horsepower and Load Factors for Construction Equipment by Fuel Type,* for forklifts and aerial lifts.

2. Default load factors are based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, *Horsepower and Load Factors for Construction Equipment by Fuel Type.*

3. Default Emission Factors for horsepower from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Baseline emission factors are averaged across the Baseline Period (2020-2024). Project emission factors are from 2027.

Table A-14. Operational - Off-Road Equipment - Project Operational Schedule

Equipment	Quantity[3]		HP [1]	Default Load Factor [2]	Daily Operating Hours per Equipment (hr/day) [3]		Operational Days (days/year) [3]		Total Equipment Annual Operating Hours (hr/yr) [4]	
	Baseline	Project			Baseline	Project	Baseline	Project	Baseline	Project
Rubber Tired Loaders	1	2	350	0.36	9	12	254	262	2,286	6,288
Water Truck	1	1	150	0.38	2	2	254	262	508	524
Forklifts/Telehandler	1	1	82	0.20	0.5	0.5	254	262	127	131
Man Basket	1	1	46	0.31	0.5	0.5	254	262	127	131
Bobcat	1	1	75	0.37	0.5	0.5	254	262	127	131

1. HP for rubber tired loader, water truck and bobcat are based on actual equipment specifications. Default HP for forklifts and man basket are based on CalEEMod 2021.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type, for forklifts and aerial lifts.

2. Default load factors are based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type.
3. Equipment quantity and operational schedule provided using the "Revised Data for Pier 92 AQ-HRA Recalculations.pdf" provided by the EP on 11/22/2025.
4. Total Equipment Annual Operating Hours (hr/yr) = No. of Equipment * Daily Operating Hours per Equipment (hr/day) * Operational Days (day/year).

Table A-15. Operational - On-Road Vehicle - Emission Factors

Vehicle Type		Year	Non-Adjusted Emission Factors			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Transfer/Customer Truck	Running (g/mi) [1]	2020 - Baseline	2.16E-01	1.29E-01	4.14E+00	1.51E-01
		2021 - Baseline	1.92E-01	1.07E-01	3.45E+00	1.13E-01
		2022 - Baseline	1.82E-01	9.73E-02	3.18E+00	9.79E-02
		2023 - Baseline	1.35E-01	5.47E-02	1.54E+00	1.63E-02
		2024 - Baseline	1.33E-01	5.28E-02	1.38E+00	1.39E-02
		Average - Baseline	**1.72E-01**	**8.81E-02**	**2.74E+00**	**7.84E-02**
		2027 - Project	**1.29E-01**	**4.91E-02**	**8.69E-01**	**1.08E-02**
	Idling (g/vehicle/day) [2]	2020 - Baseline	1.12E-01	1.07E-01	2.64E+01	2.01E+00
		2021 - Baseline	8.24E-02	7.89E-02	2.58E+01	1.95E+00
		2022 - Baseline	7.03E-02	6.73E-02	2.55E+01	1.93E+00
		2023 - Baseline	1.18E-02	1.13E-02	2.24E+01	1.81E+00
		2024 - Baseline	9.44E-03	9.03E-03	2.03E+01	1.81E+00
		Average - Baseline	**5.72E-02**	**5.47E-02**	**2.41E+01**	**1.90E+00**
		2027 - Project	**6.08E-03**	**5.82E-03**	**1.24E+01**	**1.83E+00**

Vehicle Type		Year	Adjustment Factor [3]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Transfer/Customer Truck	T7 Single Dump Class 8	2020 - Baseline	1	1	1	1
		2021 - Baseline	1	1	1	1
		2022 - Baseline	1.000000003	1.000000008	1.000000134	1
		2023 - Baseline	1.000037736	1.000037861	1.000066462	1.000044491
		2024 - Baseline	1.001736675	1.001608346	1.001831401	1.001204779
		2027 - Project	1.029507979	1.027586220	1.048645743	1.018793286

Vehicle Type		Year	Adjusted Emission Factors [4]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Transfer/Customer Truck	Running (g/mi)	2020 - Baseline	2.16E-01	1.29E-01	4.14E+00	1.51E-01
		2021 - Baseline	1.92E-01	1.07E-01	3.45E+00	1.13E-01
		2022 - Baseline	1.82E-01	9.73E-02	3.18E+00	9.79E-02
		2023 - Baseline	1.35E-01	5.47E-02	1.54E+00	1.63E-02
		2024 - Baseline	1.33E-01	5.28E-02	1.39E+00	1.39E-02
		Average - Baseline	**1.72E-01**	**8.81E-02**	**2.74E+00**	**7.84E-02**
		2027 - Project	**1.33E-01**	**5.05E-02**	**9.12E-01**	**1.10E-02**
	Idling (g/vehicle/day)	2020 - Baseline	1.12E-01	1.07E-01	2.64E+01	2.01E+00
		2021 - Baseline	8.24E-02	7.89E-02	2.58E+01	1.95E+00
		2022 - Baseline	7.03E-02	6.73E-02	2.55E+01	1.93E+00
		2023 - Baseline	1.18E-02	1.13E-02	2.24E+01	1.81E+00
		2024 - Baseline	9.46E-03	9.05E-03	2.03E+01	1.81E+00
		Average - Baseline	**5.72E-02**	**5.47E-02**	**2.41E+01**	**1.90E+00**
		2027 - Project	**6.26E-03**	**5.98E-03**	**1.30E+01**	**1.86E+00**

1. Transfer/Customer truck emission factors for running per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW. Baseline emission factors are averaged across the Baseline Period (2020-2024). Project emission factors are from 2027.

2. Transfer/Customer truck emission factors for truck idling per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for IDLEX. Baseline emission factors are averaged across the Baseline Period (2020-2024). Project emission factors are from 2027.

3. Adjustment factors per Appendix A - EMFAC2021 Adjustment Factors (October 2025) for T7 Single Dump Class 8. No Adjustment Factors were required for 2020-2021.

4. Adjusted Emission Factors = Non-Adjusted Emission Factors * Adjustment Factors.

APPENDIX B. DETAILED EMISSION CALCULATIONS

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Table 1. Operation: Criteria Pollutant Potential to Emit (PTE) Summary

Scenario	Sources	Maximum Annual Emissions (tpy)				Average Daily Emissions (lb/day) [1]			
		PM_{10}	$PM_{2.5}$	NO_x	ROG	PM_{10}	$PM_{2.5}$	NO_x	ROG
Baseline	Material Transfer	0.276	0.041	N/A	N/A	1.515	0.227	N/A	N/A
	Stockpiles	0.040	0.006	N/A	N/A	0.216	0.032	N/A	N/A
	Fugitive Road Dust	0.926	0.190	N/A	N/A	5.076	1.039	N/A	N/A
	Barge Trips	0.102	0.102	8.515	0.348	0.561	0.561	46.656	1.909
	Off-Road Equipment	0.036	0.033	0.877	0.096	0.197	0.182	4.806	0.524
	On-Road Vehicles	0.010	0.005	0.157	0.005	0.053	0.027	0.863	0.026
	Total Baseline Emissions	**1.390**	**0.377**	**9.549**	**0.449**	**7.619**	**2.068**	**52.325**	**2.458**
Project	Material Transfer	0.634	0.095	N/A	N/A	3.472	0.521	N/A	N/A
	Stockpiles	0.045	0.007	N/A	N/A	0.247	0.037	N/A	N/A
	Fugitive Road Dust	0.957	0.231	N/A	N/A	5.242	1.267	N/A	N/A
	Barge Trips	0.148	0.148	12.696	0.566	0.810	0.810	69.565	3.099
	Off-Road Equipment	0.046	0.042	1.145	0.178	0.253	0.231	6.276	0.973
	On-Road Vehicles	0.021	0.008	0.149	0.003	0.114	0.043	0.814	0.014
	Total Project Emissions	**1.850**	**0.531**	**13.989**	**0.746**	**10.138**	**2.909**	**76.655**	**4.087**
Change in Emissions [2]	Material Transfer	0.357	0.054	N/A	N/A	1.957	0.294	N/A	N/A
	Stockpiles	0.006	0.001	N/A	N/A	0.030	0.005	N/A	N/A
	Fugitive Road Dust	0.030	0.042	N/A	N/A	0.165	0.228	N/A	N/A
	Barge Trips	0.045	0.045	4.181	0.217	0.249	0.249	22.909	1.190
	Off-Road Equipment	0.010	0.009	0.268	0.082	0.056	0.050	1.470	0.450
	On-Road Vehicles	0.011	0.003	-0.009	-0.002	0.061	0.016	-0.049	-0.012
Total Change in Emissions		**0.46**	**0.15**	**4.44**	**0.30**	**2.52**	**0.84**	**24.33**	**1.63**

1. Average Daily Emissions (lb/day) = Maximum Annual Emissions (tpy) /365 * 2000 (ton/lb). Consistent with BAAQMD's CEQA Air Quality Guidelines (April 2022), Chapter 5, "Project-Level Air Quality Impacts", Section 5.2.3, "Operational Criteria Air Pollutant Emissions".
2. Change in Emissions = Project Emissions - Baseline Emissions.

Table 2. Construction: Criteria Pollutant PTE Summary

Sources	Maximum Annual Emissions (tpy)				Average Daily Emissions (lb/day) [1, 2]			
	PM_{10}	$PM_{2.5}$	NO_x	ROG	PM_{10}	$PM_{2.5}$	NO_x	ROG
Paving	N/A	N/A	N/A	1.90E-03	N/A	N/A	N/A	2.72E-02
Excavation	3.01E-02	1.66E-02	N/A	N/A	4.30E-01	2.36E-01	N/A	N/A
Grading	7.95E-04	8.59E-05	N/A	N/A	1.14E-02	1.23E-03	N/A	N/A
Off-Road Equipment	2.13E-03	2.02E-03	3.06E-01	1.61E-02	3.04E-02	2.89E-02	4.36E+00	2.30E-01
On-Road Vehicles	1.63E-03	6.77E-04	1.28E-02	6.34E-04	2.32E-02	9.68E-03	1.83E-01	9.06E-03
Fugitive Road Dust	1.63E-03	4.01E-04	N/A	N/A	2.33E-02	5.73E-03	N/A	N/A
Total Construction Emissions	**3.47E-02**	**1.93E-02**	**3.18E-01**	**1.86E-02**	**4.95E-01**	**2.76E-01**	**4.55E+00**	**2.66E-01**

1. Average Daily Emissions (lb/day) = Maximum Annual Emissions (tpy) / Construction Period (days) * 2000 (ton/lb). Construction period is 140 days per Project Sponsor. Consistent with BAAQMD's CEQA Air Quality Guidelines (April 2022), Chapter 5, "Project-Level Air Quality Impacts", Section 5.2.2, "Construction-Related Criteria Air Pollutant Emissions".
2. It is assumed that operational emissions during construction phase will not exceed Baseline operational emissions.

Table 3. Operation: Toxic Air Contaminant (TAC) PTE Summary

Scenario	Sources	Respirable Crystalline Silica (lb/yr)	Diesel Particulate Matter (lb/yr)	Heavy Metals
Baseline	Material Transfer	57.00	N/A	N/A
	Stockpiles	8.14	N/A	N/A
	Fugitive Road Dust	477.44	N/A	See Table 4
	Barge Trips	N/A	204.72	N/A
	Off-Road Equipment	N/A	71.97	N/A
	On-Road Vehicles	N/A	19.25	N/A
	Total Baseline Emissions	**542.58**	**295.95**	**See Table 4**
Project	Material Transfer	130.63	N/A	N/A
	Stockpiles	9.28	N/A	N/A
	Fugitive Road Dust	442.37	N/A	See Table 4
	Barge Trips	N/A	295.70	N/A
	Off-Road Equipment	N/A	92.39	N/A
	On-Road Vehicles	N/A	41.60	N/A
	Total Project Emissions	**582.27**	**429.69**	**See Table 4**
Change in Emissions [1]	Material Transfer	73.63	N/A	N/A
	Stockpiles	1.14	N/A	N/A
	Fugitive Road Dust	-35.08	N/A	See Table 4
	Barge Trips	N/A	90.98	N/A
	Off-Road Equipment	N/A	20.41	N/A
	On-Road Vehicles	N/A	22.35	N/A
Total Change in Emissions		**39.69**	**133.74**	**See Table 4**

1. Change in Emissions = Project Emissions - Baseline Emissions.

Table 4. Operation: TAC PTE Summary - Fugitive Road Dust

Pollutants	Annual Emissions (lb/yr)			Average Hourly Emissions (lb/hr)		
	Baseline	Project	Change in Emissions [1]	Baseline	Project	Change in Emissions [1]
Hexavalent chromium	2.72E-04	2.57E-04	-1.50E-05	3.10E-08	2.93E-08	-1.71E-09
Mercury	1.74E-05	1.75E-05	1.55E-07	1.99E-09	2.00E-09	1.77E-11
Arsenic	1.57E-02	1.42E-02	-1.49E-03	1.79E-06	1.62E-06	-1.70E-07
Beryllium	1.69E-04	1.45E-04	-2.32E-05	1.92E-08	1.66E-08	-2.65E-09
Cadmium	7.00E-05	6.48E-05	-5.14E-06	7.99E-09	7.40E-09	-5.87E-10
Cobalt	1.15E-02	1.05E-02	-9.54E-04	1.31E-06	1.20E-06	-1.09E-07
Copper	1.02E-02	9.19E-03	-9.98E-04	1.16E-06	1.05E-06	-1.14E-07
Lead	6.43E-03	5.98E-03	-4.48E-04	7.34E-07	6.83E-07	-5.11E-08
Nickel	7.53E-02	6.92E-02	-6.16E-03	8.60E-06	7.90E-06	-7.03E-07
Selenium	1.84E-04	1.70E-04	-1.35E-05	2.10E-08	1.94E-08	-1.54E-09
Vanadium	5.08E-02	4.65E-02	-4.36E-03	5.80E-06	5.31E-06	-4.98E-07
Crystalline Silica	4.77E+02	4.42E+02	-3.51E+01	5.45E-02	5.05E-02	-4.00E-03
Benzene	8.49E-04	7.37E-04	-1.12E-04	9.69E-08	8.41E-08	-1.28E-08
Toluene	8.49E-04	7.37E-04	-1.12E-04	9.69E-08	8.41E-08	-1.28E-08
Ethylbenzene	8.49E-04	7.37E-04	-1.12E-04	9.69E-08	8.41E-08	-1.28E-08
Xylenes	8.49E-04	7.37E-04	-1.12E-04	9.69E-08	8.41E-08	-1.28E-08
Naphthalene	3.64E-02	3.14E-02	-4.99E-03	4.16E-06	3.59E-06	-5.70E-07

1. Change in Emissions = Project Emissions - Baseline Emissions.

Table 5. Construction: TAC PTE Summary

Sources	Diesel Particulate Matter (lb/yr)
Paving	N/A
Excavation	N/A
Grading	N/A
Off-Road Equipment	4.26E+00
On-Road Vehicles	8.13E-07
Fugitive Road Dust	N/A
Total Construction Emissions	**4.26E+00**

Table 6. Project Operational: Material Transfer Sand Throughput

Scenario	Value	Units
Maximum Annual Throughput	800,000	ton/year

1. Maximum Annual Throughput (ton/yr) per Project Sponsor projections.

Table 7. Project Operational: Material Transfer Emission Factors

Pollutant	Emission Factor Sand Transfer (lb/ton)
PM_{10} [1]	9.90E-04
$PM_{2.5}$ [2]	1.49E-04
Crystalline Silica [3]	1.02E-04

1. PM_{10} emission factor for sand transfer per AP-42, Chapter 11.12 Concrete Batching, Table 11.12-2.

2. $PM_{2.5}$ emission factor per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM_{10} emissions.

3. Crystalline silica emission factor = PM_{10} emission factor x Site-specific respirable crystalline silica weight percent.

Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM_4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California".

The site-specific bulk material crystalline silica (wt %): 30.6%
Resultant respirable crystalline silica emission factor (wt %): 10.3%

Table 8. Project Operational: Material Transfer Criteria Pollutant PTE

Source	Annual Emissions (tpy) [1, 2]	
	PM_{10}	$PM_{2.5}$
Loader to Feed Hopper	0.40	0.06
Hopper to Conveyor (abated by Water Spray System)	0.12	0.02
Conveyor to Scalping Screen (abated by Water Spray System)	0.12	0.02
Total Emissions	**0.63**	**0.10**

1. Annual Emissions (tpy) = Maximum Annual Sand Throughput (ton/yr) * Emission Factor (lb/ton) * (1 - Control Efficiency [%]) / 2,000 (lb/ton). The control efficiency is applied to the second and third transfer points.
2. Control efficiency is used where applicable, per the BAAQMD Permit Handbook Chapter 11.5: 70%

Table 9. Project Operational: Material Transfer TAC PTE

Source	Pollutant	Annual Emissions (lb/yr) [1,2]
Loader to Feed Hopper	Crystalline Silica	81.64
Hopper to Conveyor (abated by Water Spray System)		24.49
Conveyor to Scalping Screen (abated by Water Spray System)		24.49
Total Emissions		**130.63**

1. Annual Emissions (lb/yr) = Maximum Annual Sand Throughput (ton/yr) * Respirable Crystalline Silica Emission Factor (lb/ton) * (1 - Control Efficiency [%]). The control efficiency is applied to the second and third transfer points.
2. Control efficiency is used where applicable, per the BAAQMD Permit Handbook Chapter 11.5: 70%

Table 10. Project Operational: Sand Stockpiles Criteria Pollutant PTE

Source	Maximum Stockpile Size (acres) [1]	Emission Factor (lb/day/acre) [2]		Annual Emissions (tpy) [3, 4]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Raw Material Stockpile	0.72	1.01	0.15	0.0399	0.0060
Oversized Material Stockpile	0.014	1.01	0.15	0.0008	0.0001
Product Sand Stockpiles	0.31	0.08	0.01	0.0043	0.0006
Total Emissions				**0.05**	**0.01**

1. Maximum stockpile sizes per values in the Project Sponsor projections.
2. Emission factors per Equation 4-9 from Control of Open Fugitive Dust Sources (EPA-450/3-88-008, September 1988).

$$E_{TSP} = (1.7)\left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right) \text{ (lb/acre-day)}$$

Where:

E_{TSP} = Total Suspended Solids emission factor, lb/acre/day

s= 1.58 Silt content of sand (%). Material passing the 200 mesh: average 0.5% and range of 0.2-1.58%.

p= 65 Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.2-1.

$f_{raw\ material,\ oversized}$ = 13.3 Percentage of time that the unobstructed wind speed exceeds 12 mph at the Raw Material and Oversized Stockpile is based on Mojave Desert Air Quality Management District (MDAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries, Wind Erosion from Stockpiles section.

$f_{product}$= 1.0 Percentage of time that the unobstructed wind speed exceeds 12 mph at the Product Stockpiles is estimated to be at 1%. The enclosure for the Product Stockpile is only open on the North and South ends and partially enclosed otherwise.

and

PM_{10}= 0.5 *E_{TSP} Per Page 4-17 of the Control of Open Fugitive Dust Sources (EPA-450/3-88-008, September 1988)

$PM_{2.5}$= 0.15 *PM_{10} Per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM_{10} emissions.

3. The Raw Material and Oversized Material storage piles are wetted by water spray and a control efficiency is assumed per the BAAQMD Permit Handbook Chapter 11.5: 70%

4. Raw Material and Oversized Material Storage Pile Annual Emissions (tpy) = Emission Factor (lb/acre-day) * Maximum Stockpile Size (acres) * 365 (days/yr) / 2000 (lb/ton) * (1 - Control Efficiency [%]).
Product Sand Storage Pile Annual Emissions (tpy) = Emission Factor (lb/acre-day) * Maximum Stockpile Size (acres) * 365 (days/yr) / 2000 (lb/ton). Product stockpile will be in an enclosed warehouse. Control is accounted for in the calculation of the emission factor.

Table 11. Project Operational: Sand Stockpile TAC PTE

Source	Pollutant	Emission Factor (lb/day/acre) [1]	Annual Emissions (lb/yr) [2, 3]
Raw Material Stockpile	Crystalline Silica	0.10	8.23
Oversized Material Stockpile		0.10	0.16
Product Sand Stockpiles		0.01	0.89
Total Emissions			**9.28**

1. Crystalline silica emission factor = PM_{10} emission factor x Site-specific respirable crystalline silica weight percent.

Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM_4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California".

The site-specific bulk material crystalline silica (wt %): 30.6%
Resultant respirable crystalline silica emission factor (wt %): 10.3%

2. The Raw Material and Oversized Material storage piles are wetted by water spray and a control efficiency is assumed, per the BAAQMD Permit Handbook: 70%

3. Raw Material and Oversized Material Storage Pile Annual Emissions (tpy) = Emission Factor (lb/acre-day) * Maximum Stockpile Size (acres) * 365 (days/yr) / 2000 (lb/ton) * (1 - Control Efficiency [%]).
Product Sand Storage Pile Annual Emissions (tpy) = Emission Factor (lb/acre-day) * Maximum Stockpile Size (acres) * 365 (days/yr) / 2000 (lb/ton). Product stockpile will be in an enclosed warehouse. Control is accounted for in the calculation of the emission factor.

Table 12. Project Operational: Vehicle Weights [1]

Vehicle Type	Empty Weight (lb)	Load Weight (lb)	Full Weight (lb)	Mean Vehicle Weight (tons)
Front Loader	76,409	22,000	98,409	43.70
Customer Truck	26,000	40,000	66,000	23.00

1. Vehicle weights provided by Project Sponsor.

Table 13. Project Operational: Vehicle Miles Traveled (VMT)

Parameter	Within Facility Boundary				Outside Facility Boundary		
	Unpaved Roads		Paved Roads		Paved Roads		
	Front Loader	Customer Truck	Front Loader	Customer Truck	Customer Truck (Emissions)	Customer Truck (Modeling - Off Site Locations)	Customer Truck (Modeling - Adjacent Concrete Plants)
Trip Length (ft/trip) [1, 2]	50	N/A	150	775	8,976	6,178	898
Project Annual Trips (trips/yr) [3, 4]	72,727	N/A	72,727	40,000	80,000	28,000	52,000
Project Annual VMT (mi/yr) [5]	689	N/A	2,066	5,871	136,000	32,760	8,840

1. Trip lengths within the Facility boundary is measured using Google Earth with the route provided by the Project Sponsor.

2. For emission calculations purposes, the customer truck trip length outside the Facility boundary is the weighted average trip length using the same approach as the transportation analysis. For modeling purposes, the trip lengths outside the Facility boundary are the distance between the Facility to the nearest interstate, reflecting other off-site delivery locations, and the distance between the Facility and the CEMEX main entrance driveway, reflecting the adjacent concrete plants.

3. Project Annual Trips (trips/yr) = Project Sand Annual Throughput (ton/yr) * 2000 (lb/yr) / Vehicle Capacity (lb/trip). Customer truck trip within the Facility boundary is one-way only. Customer truck trip outside the Facility boundary is multiplied by 2 to account for travel to/from the site.

4. For modeling purposes, the annual trips for customer trucks outside the Facility boundary will include travel to other off-site locations (represented by travel to Freeway) and to the adjacent concrete plants. Trip ratios to off-site direct delivery locations and to adjacent concrete plants are 35% and 65%, respectively, based on the approach used in the transportation analysis.

5. Project Annual VMT (mi/yr) = Trip Length (ft/trip) * 0.00018394 (mi/ft) * Project Annual Trips (trips/yr).

Table 14. Project Operational: Fugitive Dust Criteria Pollutant PTE from Unpaved Roads

Scenario		Emission Factor (lb/VMT) [1]		Annual Emissions (tpy) [2, 3, 4, 5]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Within Facility Boundary	Front Loader	3.12	0.31	0.08	0.02
	Customer Truck	N/A	N/A	N/A	N/A
Total Annual Emissions				**0.08**	**0.02**

1. Fugitive emission estimates for vehicle travel on unpaved roads were calculated per AP-42 Chapter 13.2.2 as follows:

$$E = k(\frac{s}{12})^a \times (\frac{W}{3})^b$$

Where:

E= Size-specific emission factor (lb/VMT)

$s_{front\ loader}$ = 7.1 Surface material silt content (%) for sand and gravel processing (material storage area mean)

a,b,k = Constants per Table 13.2.2-2 for industrial roads

	PM_{10}	$PM_{2.5}$
k =	1.5	0.15
a =	0.9	0.9
b =	0.45	0.45

W = Mean vehicle weight (tons).

2. PM_{10} Control efficiency for watering: 70% per the BAAQMD Permit Handbook.

3. $PM_{2.5}$ Control efficiency for watering: 40% per the BAAQMD Permit Handbook.

4. Control efficiency for the front loader travel in the enclosed warehouse: 75% per MDAQMD Emissions Inventory Guidance for Mineral Handling and Processing Industries.

5. Annual Emissions (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) * (1 - Control $Efficiency_{watering}$ [%] * (1 - Control $Efficiency_{warehouse}$ [%]) / 2,000 (lb/ton).

Table 15. Project Operational: Fugitive Dust Criteria Pollutant PTE from Paved Roads

Scenario		Emission Factor (lb/VMT) [1]		Annual Emissions (tpy) [2, 3, 4]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Within Facility Boundary	Front Loader	0.951	0.233	0.295	0.072
	Customer Truck	0.494	0.121	0.435	0.107
Outside Facility Boundary	Customer Truck (Emissions)	0.002	0.001	0.146	0.036
	Customer Truck (Modeling - Off Site Locations)	0.003	0.001	0.043	0.010
	Customer Truck (Modeling - Adjacent Concrete Plants)	0.007	0.002	0.032	0.008
Total Annual Emissions [5]				**0.876**	**0.215**

1. Fugitive emissions estimates for vehicle travel on paved roads at Pier 92 were calculated based on AP-42 Chapter 13.2.1 (updated January 2011) Equation 2 as follows:

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

Where:

E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1
$sL_{\text{within Facility boundary}}$ =	12		Road surface silt loading (g/m^2) for Concrete Batching Facility (AP-42 Chapter 13.2.1).
$sL_{\text{outside Facility boundary, emissions}}$ =	0.031		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway.
$sL_{\text{outside Facility boundary, Modeling - Off Site Locations}}$ =	0.038		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below, excluding travel on Freeways.
$sL_{\text{outside Facility boundary, Modeling - Adjacent Plants}}$ =	0.116		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street (North/South and East/West bound). The distance traveled on the East/West bound segment of Amador street is 635 feet as measured in Google Earth.

Segment	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Freeway	2,798	0.015	Distance is the difference between Off-Site Travel Distance (Emissions) and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Freeways.

W =		Mean vehicle weight (tons). Note that actual vehicle weight for customer truck travel outside the facility boundary was conservatively used in lieu of the CalEEMod default vehicle weight of 2.4 tons.
P =	65	Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.
N =	365	Number of days in the averaging period

2. Control Efficiency for watering within the facility boundary: 70% per the BAAQMD Permit Handbook
3. Annual Emissions Within Facility Boundary (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) * (1 - Control Efficiency [%]) / 2,000 (lb/ton).
4. Annual Emissions Outside Facility Boundary (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) / 2,000 (lb/ton).
5. Total Annual Emissions = Within Facility Boundary Emissions (Front Loader + Customer Truck) and Outside Facility Boundary Emissions (Customer Truck (Emissions)).

Table 16. Baseline Operational: Fugitive Dust TAC Emissions from Unpaved and Paved Roads within Facility Boundary

Vehicle Type	Pollutant	TAC Speciation (wt %) [1]	Annual Emissions (lb/yr) [2]		Average Hourly Emissions (lb/hr) [3]	
			Within Facility Boundary		Within Facility Boundary	
			Unpaved Roads	Paved Roads	Unpaved Roads	Paved Roads
Front Loader	Hexavalent chromium	1.80E-07	2.90E-05	1.06E-04	3.31E-09	1.21E-08
	Mercury	1.70E-08	2.74E-06	1.00E-05	3.13E-10	1.14E-09
	Arsenic	7.30E-06	1.18E-03	4.30E-03	1.34E-07	4.91E-07
	Beryllium	4.30E-08	6.94E-06	2.53E-05	7.92E-10	2.89E-09
	Cadmium	4.00E-08	6.45E-06	2.36E-05	7.36E-10	2.69E-09
	Cobalt	6.00E-06	9.68E-04	3.54E-03	1.10E-07	4.04E-07
	Copper	4.60E-06	7.42E-04	2.71E-03	8.47E-08	3.09E-07
	Lead	3.80E-06	6.13E-04	2.24E-03	7.00E-08	2.56E-07
	Nickel	4.00E-05	6.45E-03	2.36E-02	7.36E-07	2.69E-06
	Selenium	1.05E-07	1.69E-05	6.19E-05	1.93E-09	7.06E-09
	Vanadium	2.60E-05	4.19E-03	1.53E-02	4.79E-07	1.75E-06
	Crystalline Silica	2.73E-01	4.40E+01	1.61E+02	5.03E-03	1.84E-02
	Benzene	2.40E-07	3.87E-05	1.41E-04	4.42E-09	1.61E-08
	Toluene	2.40E-07	3.87E-05	1.41E-04	4.42E-09	1.61E-08
	Ethylbenzene	2.40E-07	3.87E-05	1.41E-04	4.42E-09	1.61E-08
	Xylenes	2.40E-07	3.87E-05	1.41E-04	4.42E-09	1.61E-08
	Naphthalene	9.40E-06	1.52E-03	5.54E-03	1.73E-07	6.32E-07
Customer Truck	Hexavalent chromium	1.40E-07	N/A	1.22E-04	N/A	1.39E-08
	Mercury	5.50E-09	N/A	4.78E-06	N/A	5.46E-10
	Arsenic	1.00E-05	N/A	8.70E-03	N/A	9.93E-07
	Beryllium	1.30E-07	N/A	1.13E-04	N/A	1.29E-08
	Cadmium	4.00E-08	N/A	3.48E-05	N/A	3.97E-09
	Cobalt	6.90E-06	N/A	6.00E-03	N/A	6.85E-07
	Copper	6.60E-06	N/A	5.74E-03	N/A	6.55E-07
	Lead	3.60E-06	N/A	3.13E-03	N/A	3.58E-07
	Nickel	4.50E-05	N/A	3.91E-02	N/A	4.47E-06
	Selenium	1.05E-07	N/A	9.13E-05	N/A	1.04E-08
	Vanadium	3.10E-05	N/A	2.70E-02	N/A	3.08E-06
	Crystalline Silica	2.73E-01	N/A	2.37E+02	N/A	2.71E-02
	Benzene	6.40E-07	N/A	5.57E-04	N/A	6.36E-08
	Toluene	6.40E-07	N/A	5.57E-04	N/A	6.36E-08
	Ethylbenzene	6.40E-07	N/A	5.57E-04	N/A	6.36E-08
	Xylenes	6.40E-07	N/A	5.57E-04	N/A	6.36E-08
	Naphthalene	2.80E-05	N/A	2.44E-02	N/A	2.78E-06

1. TAC speciation percentages are from site-specific analytical sampling taken August 1, 2024.
2. Annual TAC Emissions (lb/yr) = TAC speciation (%) * PM_{10} Annual Emissions (tpy) * 2000 (lb/ton).
3. Average Hourly Emissions (lb/hr) = Annual Emissions (lb/yr) / 365 (days/yr) / 24 (hr/day).

Table 17. Project Operational: Parameters for Tugboat and Barge Engines

Parameter	Tugboat - Main Engine	Tugboat - Generator Engine	Barge - Main Engine	Barge - Generator Engine	Barge - Bow Thruster Engine
Model	Caterpillar C32	John Deere Powertech 4045TFM85	Caterpillar 3512C	Caterpillar C7.1	Caterpillar C9.3
Engine Family Name	FCPXN32.1EP3	FJDXN04.5146	ECPXN78.1AT3	GPKXN07.0BP1	GCPXN09.3EB3
Engine Power (bhp)	1,200	99	1,750	257	375
Engines per vessel	2	2	1	1	1
Operating time per trip (each) (hr/trip) [1]	2.5	8	4	24	1
Barge Capacity (tons/trip)	3,250				
Project Max Annual Barge Trips (trips/yr) [2]	250				
Project Operating time per year (each) (hr/yr) [3]	625	2,000	1,000	8,760	250

1. The tugboat main engines operate for the 1.25 hour journey between the sand mine and Pier 92, for a round-trip time of 2.5 hours per trip.
A tugboat generator engine operates 8 hours per trip. When not in use, the tugboat will be on shore power.
The barge main engine operates for 4 hours during each unloading process.
The barge generator engine operates continuously. A maximum operation of 365 days per year is reflected.
The barge bow thruster engine operates during the maneuvering process into and out of the pier unloading position for approximately 30 minutes to 1 hour (total) per trip.

2. Project Max Annual Barge Trips (trips/yr) = Project Max Throughput (tons/yr) / Barge Capacity (tons/trip).

3. Project Annual Operating Time (hr/yr) = Operating time per trip (each) (hr/trip) * Project Max Annual Barge Trips (trips/yr).

Table 18. Project Operational: Emission Factors for Tugboat and Barge Engines

Engine	Engine Power		Emission Factors [3]			
	Total Power (bhp) [1]	Load (%) [2]	PM_{10} (g/bhp-hr)	$PM_{2.5}$ (g/bhp-hr)	NO_x (g/bhp-hr)	ROG (g/bhp-hr)
Tugboat - Main Engine	2,400	30	0.05	0.05	3.54	0.19
Tugboat - Generator Engine	198	60	0.07	0.07	3.40	0.18
Barge - Main Engine	1,750	60	0.03	0.03	3.97	0.21
Barge - Generator Engine	257	60	0.04	0.04	3.51	0.12
Barge - Bow Thruster Engine	375	60	0.05	0.05	3.65	0.11

1. Total Power (bhp) = Engine Power (bhp) * Engine per vessel.

2. Load factor per project-specific information.

3. ROG, NO_x, PM_{10}, $PM_{2.5}$ emission factors per EPA's Marine Compression-Ignition (CI) Engines certification database. EPA's Marine CI database provided a NO_x + NMHC emission factor for the main engine which is assumed to be 95% NO_x and 5% VOC based on the BAAQMD's policy, CARB Emission Factors for CI Diesel Engines (effective June 28, 2004).

Table 19. Project Operational: Criteria Pollutant PTE for Tugboat and Barge Engines

Engine	Annual Emissions (tpy) [1]			
	PM_{10}	$PM_{2.5}$	NO_x	ROG
Tugboat - Main Engine	0.026	0.026	1.757	0.092
Tugboat - Generator Engine	0.018	0.018	0.891	0.047
Barge - Main Engine	0.035	0.035	4.592	0.242
Barge - Generator Engine	0.067	0.067	5.230	0.178
Barge - Bow Thruster Engine	0.003	0.003	0.227	0.007
Total Annual Emissions	**0.148**	**0.148**	**12.696**	**0.566**

1. Total Annual Emissions (tpy) = Emission Factor (g/bhp-hr) * 0.00220462 (lb/g) * Total Engine Power (bhp) * Annual Operating Time (hr/yr) * Engine Load (%) / 2,000 (lb/ton).

Table 20. Project Operational: TAC PTE for Tugboat and Barge Engines

Source	Pollutant	Annual Emissions (lb/yr) [1,2]
Tugboat - Main Engine	Diesel Particulate Matter (DPM)	51.79
Tugboat - Generator Engine		35.16
Barge - Main Engine		69.05
Barge - Generator Engine		133.24
Barge - Bow Thruster Engine		6.47
Total Emissions		**295.70**

1. Conservatively assumes that DPM emission is equal to the $PM_{10}/PM_{2.5}$ emissions.
2. Annual Emissions (lb/yr) = $PM_{10}/PM_{2.5}$ Annual Emissions (tpy) * 2000 (lb/ton).

Table 21. Project Operational: Off-Road Equipment List

Equipment	Quantity	Operational Schedule [1]		Total Annual Operating Hours [2]	Fuel	Brake Horsepower (bhp) [3]	Default Load Factor [4]
		hr/day	day/yr				
Rubber Tired Loaders	2	12	262	6,288	Diesel	350	0.36
Water Truck	1	2	262	524	Diesel	150	0.38
Forklifts/Telehandler	1	0.5	262	131	Diesel	82	0.2
Man Basket	1	0.5	262	131	Diesel	46	0.31
Bobcat	1	0.5	262	131	Diesel	75	0.37

1. Operational schedule provided by the EP per "Revised Data for Pier 92 AQ-HRA Recalculations.pdf" received on 11/22/2025.

2. Total Annual Operating Hours (hr/yr) = No. of Equipment * Daily Operating Hours per Equipment (hr/day) * Operational Days (day/yr).

3. Brake horse power (bhp) for rubber tired loader, water truck and bobcat are based on actual equipment specifications. Default bhp for forklifts and man basket are based on CalEEMod 2021.1 User Guide Appendix G, Table G-12, *Horsepower and Load Factors for Construction Equipment by Fuel Type,* for forklifts and aerial lifts.

4. Default load factors are based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, *Horsepower and Load Factors for Construction Equipment by Fuel Type.*

Table 22. Project Operational: Off-Road Equipment Emission Factors

Equipment	Type	Year	Emission Factors (g/bhp-hr)[1]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Rubber Tired Loaders	Rubber Tired Loader (300 - 600 bhp)	2027	0.046	0.042	1.203	0.188
Water Truck	Off-Highway Trucks (100 - 175 bhp)	2027	0.053	0.049	1.062	0.194
Forklifts/Telehandler	Forklifts (75 - 100 bhp)	2027	0.092	0.085	2.152	0.228
Man Basket	Aerial Lifts (25 - 50 bhp)	2027	0.020	0.019	2.870	0.151
Bobcat	Tractors/Loaders/Backhoes (50 - 75 bhp)	2027	1.002	0.922	12.173	1.556

1. Default Emission Factors for horsepower from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Project emission factors are from 2027 operational year.

Table 23. Project Operational: Off-Road Equipment Criteria Pollutant PTE

Equipment	Total Annual Emissions (tpy) [1]			
	PM_{10}	$PM_{2.5}$	NO_x	ROG
Rubber Tired Loaders	4.02E-02	3.67E-02	1.05E+00	1.64E-01
Water Truck	1.74E-03	1.61E-03	3.50E-02	6.39E-03
Forklifts/Telehandler	2.18E-04	2.01E-04	5.10E-03	5.40E-04
Man Basket	4.12E-05	3.91E-05	5.91E-03	3.11E-04
Bobcat	4.02E-03	3.69E-03	4.88E-02	6.24E-03
Total Annual Emissions	**4.62E-02**	**4.22E-02**	**1.15E+00**	**1.78E-01**

1. Total Annual Emissions (tpy) = Emission Factor (g/bhp-hr) * Equipment Horsepower (HP) * Default Load Factor * 0.00220462 (lb/g) * Total Annual Operating Hours (hr/yr) / 2,000 (lb/ton)

Table 24. Project Operational: On-Road Vehicle

Location	Vehicle Type	Trip Length (mi/trip) [1, 2]	Annual Trips (trips/yr) [3, 4]	Annual VMT (mi/yr) [5]
Within Facility Boundary	Customer Truck	0.15	40,000	5,871
Outside Facility Boundary	Customer Truck (Emissions)	1.70	80,000	136,000
	Customer Truck (Modeling - Off Site Locations)	1.17	28,000	32,760
	Customer Truck (Modeling - Adjacent Concrete Plants)	0.17	52,000	8,840

1. Trip lengths within the Facility boundary is measured using Google Earth with the route provided by the Project Sponsor.
2. For emission calculations purposes, the customer truck trip length outside the Facility boundary is the weighted average trip length using the same approach as the transportation analysis. For modeling purposes, the trip lengths outside the Facility boundary are the distance between the Facility to the nearest interstate, reflecting other off-site delivery locations, and the distance between the Facility and the CEMEX main entrance driveway, reflecting the adjacent concrete plants.

3. Project Annual Trips (trips/yr) = Project Sand Annual Throughput (ton/yr) * 2000 (lb/yr) / Vehicle Capacity (lb/trip). Customer truck trip within the Facility boundary is one-way only. Customer truck trip outside the Facility boundary is multiplied by 2 to account for travel to/from the site.

4. For modeling purposes, the annual trips for customer trucks outside the Facility boundary will include travel to other off-site locations (represented by travel to Freeway) and to the adjacent concrete plants. Trip ratios to off-site direct delivery locations and to adjacent concrete plants are 35% and 65%, respectively, based on the approach used in the transportation analysis.

5. Project Annual VMT (mi/yr) = Trip Length (mi/trip) * Project Annual Trips (trips/yr).

Table 25. Project Operational: On-Road Vehicle Emission Factors

Equipment		Year	Emission Factors			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Customer Truck	Running (g/mi) [1]	2027	1.33E-01	5.05E-02	9.12E-01	1.10E-02
	Idling (g/vehicle/day) [2]	2027	6.26E-03	5.98E-03	1.30E+01	1.86E+00

1. Transfer/Customer truck emission factors for running per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW. Project emission factors are from 2027. Conservatively incorporates CARB's upward adjustment factors for EMFAC2021 - Appendix A, released in October 2025.

2. Transfer/Customer truck emission factors for truck idling per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for IDLEX. Project emission factors are from 2027. Conservatively incorporates CARB's upward adjustment factors for EMFAC2021 - Appendix A, released in October 2025.

Table 26. Project Operational: On-Road Vehicle Criteria Pollutant PTE

Location	Vehicle Type	Emissions Type	Annual Emission (tpy) [1, 2, 3]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Within Facility Boundary	Customer Truck	Running	8.61E-04	3.27E-04	5.90E-03	7.10E-05
		Idling	9.59E-07	9.16E-07	2.00E-03	2.85E-04
Outside Facility Boundary	Customer Truck (Emissions)	Running	1.99E-02	7.56E-03	1.37E-01	1.64E-03
		Idling	1.92E-06	1.83E-06	3.99E-03	5.70E-04
	Customer Truck (Modeling - Off Site Locations)	Running	4.80E-03	1.82E-03	3.29E-02	3.96E-04
		Idling	6.71E-07	6.41E-07	1.40E-03	1.99E-04
	Customer Truck (Modeling - Adjacent Concrete Plants)	Running	1.30E-03	4.92E-04	8.88E-03	1.07E-04
		Idling	1.25E-06	1.19E-06	2.60E-03	3.70E-04
Total Annual Emissions [4]			**2.08E-02**	**7.89E-03**	**1.49E-01**	**2.57E-03**

1. Assume one vehicle per trip and 5 mins of idling time per trip.
2. Running: Annual Emissions (tpy) = Emission Factors (g/mi) * Annual VMT (mi). Converted to units of ton.
3. Idling: Annual Emissions (tpy) = Emission Factors (g/vehicle/day) / 24 (hr/day) / 60 (mins/hr) * Idling time (mins/trip) * Annual Trips (trips/yr). Converted to units of ton.
4. Total Annual Emissions = Within Facility Boundary Emissions (Customer Truck) and Outside Facility Boundary Emissions (Customer Truck (Emissions)).

Table 27. Project Baseline: TAC PTE for Off-Road Equipment and On-Road Vehicle

Off-Road Equipment	Pollutant	Annual Emissions (lb/yr) [1]
Rubber Tired Loaders	Diesel Particulate Matter (DPM)	80.35
Water Truck		3.49
Forklifts/Telehandler		0.44
Man Basket		0.08
Bobcat		8.03
Total Annual Off-Road Emissions		**92.39**

On-Road Vehicle		Pollutant	Annual Emissions (lb/yr) [1]
Within Facility Boundary	Customer Truck	Diesel Particulate Matter (DPM)	1.72
Outside Facility Boundary	Customer Truck (Emissions)		39.88
	Customer Truck (Modeling - Off Site Locations)		9.61
	Customer Truck (Modeling - Adjacent Concrete Plants)		2.59
Total Annual On-Road Emissions [3]			**41.60**

1. Conservatively assumes that DPM emission is equal to PM_{10} emissions.
2. Annual Emissions (lb/yr) = PM_{10} Annual Emissions (tpy) * 2000 (lb/ton).
3. Total Annual Emissions = Within Facility Boundary Emissions (Customer Truck) and Outside Facility Boundary Emissions (Customer Truck (Emissions)).

Table 28. Baseline Operational: Material Transfer Sand Throughput Limits

Scenario	Value [1]	Units
Baseline Annual Throughput	349,078	ton/year

1. Baseline throughput as determined by EP per operation during Baseline Period 2020-2024.

Table 29. Baseline Operational: Material Transfer Emission Factors

Pollutant	Emission Factor Sand Transfer (lb/ton)
PM_{10} [1]	9.90E-04
$PM_{2.5}$ [2]	1.49E-04
Crystalline Silica [3]	1.02E-04

1. PM_{10} emission factor for sand transfer per AP-42, Chapter 11.12 Concrete Batching, Table 11.12-2.

2. $PM_{2.5}$ emission factor per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM_{10} emissions.

3. Crystalline silica emission factor = PM_{10} emission factor x Site-specific respirable crystalline silica weight percent.

Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM_4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California".

The site-specific bulk material crystalline silica (wt %): 30.6%
Resultant respirable crystalline silica emission factor (wt %): 10.3%

Table 30. Baseline Operational: Material Transfer Criteria Pollutant PTE

Source	Annual Emissions (tpy) [1, 2]	
	PM_{10}	$PM_{2.5}$
Loader to Feed Hopper	0.17	0.03
Hopper to Conveyor (abated by A-1 Water Spray System)	0.05	0.01
Conveyor to Screen (abated by A-1 Water Spray System)	0.05	0.01
Total Emissions	**0.28**	**0.04**

1. Annual Emissions (tpy) = Maximum Annual Sand Throughput (ton/yr) * Emission Factor (lb/ton) * (1 - Control Efficiency [%]) / 2,000 (lb/ton). The control efficiency is applied to the second and third transfer points.
2. Control efficiency is used where applicable, per the BAAQMD Permit Handbook Chapter 11.5: 70%

Table 31. Baseline Operational: Material Transfer TAC PTE

Source	Pollutant	Annual Emissions (lb/yr) [1,2]
Loader to Feed Hopper	Crystalline Silica	35.62
Hopper to Conveyor (abated by A-1 Water Spray System)		10.69
Conveyor to Screen (abated by A-1 Water Spray System)		10.69
Total Emissions		**57.00**

1. Annual Emissions (lb/yr) = Maximum Annual Sand Throughput (ton/yr) * Respirable Crystalline Silica Emission Factor (lb/ton) * (1 - Control Efficiency [%]). The control efficiency is applied to the second and third transfer points.
2. Control efficiency is used where applicable, per the BAAQMD Permit Handbook Chapter 11.5: 70%

Table 32. Baseline Operational: Sand Stockpiles Criteria Pollutant PTE

Source	Baseline Stockpile Size (acres) [1]	Emission Factor (lb/day/acre) [2]		Annual Emissions (tpy) [3,4]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Raw Material Stockpile	0.460	1.01	0.15	0.0255	0.0038
Oversized Stockpile	0.014	1.01	0.15	0.0008	0.0001
Product Sand Stockpile	0.238	1.01	0.15	0.0132	0.0020
Total Emissions				**0.040**	**0.006**

1. Baseline stockpile sizes during Baseline Period 2020-2024 provided by Project Sponsor.
2. Emission factors per Equation 4-9 from Control of Open Fugitive Dust Sources (EPA-450/3-88-008, September 1988).

$$E_{TSP} = (1.7)\left(\frac{s}{1.5}\right)\left(\frac{365-p}{235}\right)\left(\frac{f}{15}\right) \text{ (lb/acre-day)}$$

Where:

E_{TSP} = Total Suspended Solids emission factor, lb/acre/day

s= 1.58 Silt content of sand (%). Material passing the 200 mesh: average 0.5% and range of 0.2-1.58%.

p= 65 Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.2-1.

f= 13.3 Percentage of time that the unobstructed wind speed exceeds 12 mph, based on Mojave Desert Air Quality Management District (MDAQMD) Emissions Inventory Guidance for Mineral Handling and Processing Industries, Wind Erosion from Stockpiles section.

and

PM_{10}= 0.5 *E_{TSP} Per Page 4-17 of the Control of Open Fugitive Dust Sources (EPA-450/3-88-008, September 1988)

$PM_{2.5}$= 0.15 *PM_{10} Per BAAQMD Permit Handbook Chapter 11.5 for Concrete Batch Plants, $PM_{2.5}$ is equal to 15% of PM_{10} emissions.

3. Storage piles are wetted by water spray and a control efficiency is assumed per the BAAQMD Permit Handbook Chapter 11.5: 70%
4. Annual Emissions (tpy) = Emission Factor (lb/acre-day) * Stockpile Size (acres) * (1 - Control Efficiency [%]) * 365 (days/yr) / 2000 (lb/ton).

Table 33. Baseline Operational: Sand Stockpiles TAC PTE

Source	Pollutant	Uncontrolled Emission Factor (lb/day/acre) [1]	Annual Emissions (lb/yr) [2, 3]
Raw Material Stockpile	Crystalline Silica	0.10	5.3
Oversized Stockpile		0.10	0.2
Product Sand Stockpile		0.10	2.7
Total Emissions			**8.1**

1. Crystalline silica emission factor = PM_{10} emission factor x Site-specific respirable crystalline silica weight percent.

Site-specific respirable crystalline silica weight percent was calculated using the correlation associated with the site-specific bulk material crystalline silica content and PM_4 crystalline silica emission factor. The correlation was obtained from Figure 4 of the Journal of the Air & Waste Management Association article, "PM_4 Crystalline Silica Emission Factors and Ambient Concentrations at Aggregate-Producing Sources in California".

The site-specific bulk material crystalline silica (wt %): 30.6%
Resultant respirable crystalline silica emission factor (wt %): 10.3%

2. Storage piles are wetted by water spray and a control efficiency is assumed, per the BAAQMD Permit Handbook: 70%
3. Annual Emissions (lb/yr) = Emission Factor (lb/acre-day) * Stockpile Size (acres) * (1 - Control Efficiency %) * 365 (days/yr).

Table 34. Baseline Operational: Vehicle Weights [1]

Vehicle Type	Empty Weight (lb)	Load Weight (lb)	Full Weight (lb)	Mean Vehicle Weight (tons)
Front Loader	76,409	22,000	98,409	43.70
Customer Truck	26,000	40,000	66,000	23.00

1. Vehicle weights provided by the Project Sponsor.

Table 35. Baseline Operational: Vehicle Miles Traveled (VMT)

Parameter	Within Facility Boundary				Outside Facility Boundary		
	Unpaved Roads		Paved Roads		Paved Roads		
	Front Loader	Customer Truck	Front Loader	Customer Truck	Customer Truck (Emissions)	Customer Truck (Modeling - Off Site Locations)	Customer Truck (Modeling - Adjacent Concrete Plants)
Trip Length (ft/trip) [1, 2]	120	745	N/A	215	8,976	6,178	898
Baseline Annual Trips (trips/yr) [3, 4]	31,734	14,191	N/A	14,191	28,382	9,934	18,448
Baseline Annual VMT (mi/yr) [5]	721	2,002	N/A	578	48,249	11,623	3,136

1. Trip lengths within the Facility boundary is measured using Google Earth with the route provided by the Project Sponsor.

2. For emission calculations purposes, the customer truck trip length outside the Facility boundary is the weighted average trip length using the same approach as the transportation analysis. For modeling purposes, the trip lengths outside the Facility boundary are the distance between the Facility to the nearest interstate, reflecting other off-site delivery locations, and the distance between the Facility and the CEMEX main entrance driveway, reflecting the adjacent concrete plants.

3. Loader Baseline Annual Trips (trips/yr) = Baseline Sand Annual Throughput (ton/yr) * 2000 (lb/yr) / Loader Capacity (lb/trip).
Customer Truck Baseline Annual Trips (trip/yr) = Actual Trips from Baseline Period (70,954 trips) / 5 Years. Baseline actual trips per EP on "Revised Data for Pier 92 AQ-HRA Recalculations.pdf" received on 11/22/2025. Customer truck trip within the Facility boundary is one-way only. Customer truck trip outside the Facility boundary is multiplied by 2 to account for travel to/from the site.

4. For modeling purposes, the annual trips for customer trucks outside the Facility boundary will include travel to other off-site locations (represented by travel to Freeway) and to the adjacent concrete plants. Trip ratios to off-site direct delivery locations and to adjacent concrete plants are 35% and 65%, respectively, based on the approach used in the transportation analysis.

5. Baseline Annual VMT (mi/yr) = Trip Length (ft/trip) * 0.00018394 (mi/ft) * Baseline Annual Trips (trips/yr).

Table 36. Baseline Operational: Fugitive Dust Criteria Pollutant PTE from Unpaved Roads

Scenario		Emission Factor (lb/VMT) [1]		Annual Emissions (tpy) [2, 3, 4]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Within Facility Boundary	Front Loader	3.12	0.31	0.34	0.07
	Customer Truck	1.64	0.16	0.49	0.10
Total Annual Emissions				**0.83**	**0.17**

1. Fugitive emission estimates for vehicle travel from unpaved roads were calculated per AP-42 Chapter 13.2.2 as follows:

$$E = k(\frac{s}{12})^a \times (\frac{W}{3})^b$$

Where:

E= Size-specific emission factor (lb/VMT)

$s_{front\ loader}$ = 7.1 Surface material silt content (%) for sand and gravel processing (material storage area mean)

$s_{customer\ truck}$ = 4.8 Surface material silt content (%) for sand and gravel processing (plant road mean)

a,b,k = Constants per Table 13.2.2-2 for industrial roads

	PM_{10}	$PM_{2.5}$
k =	1.5	0.15
a =	0.9	0.9
b =	0.45	0.45

W = Mean vehicle weight (tons)

2. PM_{10} Control efficiency for watering: 70% per the BAAQMD Permit Handbook.
3. $PM_{2.5}$ Control efficiency for watering: 40% per the BAAQMD Permit Handbook.
4. Annual Emissions (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) * (1 - Control Efficiency [%]) / 2,000 (lb/ton).

Table 37. Baseline Operational: Fugitive Dust Criteria Pollutant PTE from Paved Roads

Scenario		Emission Factor (lb/VMT) [1]		Annual Emissions (tpy) [2, 3, 4, 5]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Within Facility Boundary	Front Loader	N/A	N/A	N/A	N/A
	Customer Truck	0.494	0.121	0.043	0.011
Outside Facility Boundary	Customer Truck (Emissions)	0.002	0.000528	0.052	0.013
	Customer Truck (Modeling - Off Site Locations)	0.003	0.00064	0.015	0.004
	Customer Truck (Modeling - Adjacent Concrete Plants)	0.007	0.002	0.011	0.003
Total Annual Emissions [5]				**0.095**	**0.023**

1. Fugitive emissions estimates for vehicle travel on paved roads at Pier 92 were calculated based on AP-42 Chapter 13.2.1 (updated January 2011) Equation 2 as follows:

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

Where:

E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1
$sL_{\text{within Facility boundary}}$ =	12		Road surface silt loading (g/m^2) for Concrete Batching Facility (AP-42 Chapter 13.2.1)
$sL_{\text{outside Facility boundary, emissions}}$ =	0.031		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway.
$sL_{\text{outside Facility boundary, Modeling - Off Site Locations}}$ =	0.038		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below, excluding travel on Freeways.
$sL_{\text{outside Facility boundary, Modeling - Adjacent Plants}}$ =	0.116		Road surface silt loading (g/m^2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street (North/South and East/West bound). The distance traveled on the East/West bound segment of Amador street is 635 feet as measured in Google Earth.

Section	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines,* Appendix E, Table 22 for Major Streets.
Freeway	2,798	0.015	Distance is the difference between Off-Site Travel Distance (Emissions) and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District *CEQA Air Quality Guidelines, Appendix E*, Table 22 for Freeways.

W = Mean vehicle weight (tons). Note that actual vehicle weight for customer truck travel outside the facility boundary was conservatively used in lieu of the CalEEMod default vehicle weight of 2.4 tons.

P = 65 Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.

N = 365 Number of days in the averaging period

2. Control efficiency for watering within the facility boundary: 70% per the BAAQMD Permit Handbook
3. Annual Emissions Within Facility Boundary (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) * (1 - Control Efficiency [%]) / 2,000 (lb/ton).
4. Annual Emissions Outside Facility Boundary (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) / 2,000 (lb/ton).
5. Total Annual Emissions = Within Facility Boundary Emissions (Front Loader + Customer Truck) and Outside Facility Boundary Emissions (Customer Truck (Emissions)).

Table 38. Baseline Operational: Fugitive Dust TAC Emissions from Unpaved and Paved Roads within Facility Boundary

Vehicle Type	Pollutant	TAC Speciation (wt %) [1]	Annual Emissions (lb/yr) [2]		Average Hourly Emissions (lb/hr) [3]	
			Within Facility Boundary		Within Facility Boundary	
			Unpaved Roads	Paved Roads	Unpaved Roads	Paved Roads
Front Loader	Hexavalent chromium	1.80E-07	1.22E-04	N/A	1.39E-08	N/A
	Mercury	1.70E-08	1.15E-05	N/A	1.31E-09	N/A
	Arsenic	7.30E-06	4.93E-03	N/A	5.63E-07	N/A
	Beryllium	4.30E-08	2.91E-05	N/A	3.32E-09	N/A
	Cadmium	4.00E-08	2.70E-05	N/A	3.08E-09	N/A
	Cobalt	6.00E-06	4.05E-03	N/A	4.63E-07	N/A
	Copper	4.60E-06	3.11E-03	N/A	3.55E-07	N/A
	Lead	3.80E-06	2.57E-03	N/A	2.93E-07	N/A
	Nickel	4.00E-05	2.70E-02	N/A	3.08E-06	N/A
	Selenium	1.05E-07	7.09E-05	N/A	8.10E-09	N/A
	Vanadium	2.60E-05	1.76E-02	N/A	2.01E-06	N/A
	Crystalline Silica	2.73E-01	1.84E+02	N/A	2.11E-02	N/A
	Benzene	2.40E-07	1.62E-04	N/A	1.85E-08	N/A
	Toluene	2.40E-07	1.62E-04	N/A	1.85E-08	N/A
	Ethylbenzene	2.40E-07	1.62E-04	N/A	1.85E-08	N/A
	Xylenes	2.40E-07	1.62E-04	N/A	1.85E-08	N/A
	Naphthalene	9.40E-06	6.35E-03	N/A	7.25E-07	N/A
Customer Truck	Hexavalent chromium	1.40E-07	1.38E-04	1.20E-05	1.58E-08	1.37E-09
	Mercury	5.50E-09	5.43E-06	4.71E-07	6.20E-10	5.38E-11
	Arsenic	1.00E-05	9.88E-03	8.56E-04	1.13E-06	9.77E-08
	Beryllium	1.30E-07	1.28E-04	1.11E-05	1.47E-08	1.27E-09
	Cadmium	4.00E-08	3.95E-05	3.42E-06	4.51E-09	3.91E-10
	Cobalt	6.90E-06	6.82E-03	5.91E-04	7.78E-07	6.74E-08
	Copper	6.60E-06	6.52E-03	5.65E-04	7.44E-07	6.45E-08
	Lead	3.60E-06	3.56E-03	3.08E-04	4.06E-07	3.52E-08
	Nickel	4.50E-05	4.45E-02	3.85E-03	5.07E-06	4.40E-07
	Selenium	1.05E-07	1.04E-04	8.99E-06	1.18E-08	1.03E-09
	Vanadium	3.10E-05	3.06E-02	2.65E-03	3.50E-06	3.03E-07
	Crystalline Silica	2.73E-01	2.70E+02	2.34E+01	3.08E-02	2.67E-03
	Benzene	6.40E-07	6.32E-04	5.48E-05	7.22E-08	6.26E-09
	Toluene	6.40E-07	6.32E-04	5.48E-05	7.22E-08	6.26E-09
	Ethylbenzene	6.40E-07	6.32E-04	5.48E-05	7.22E-08	6.26E-09
	Xylenes	6.40E-07	6.32E-04	5.48E-05	7.22E-08	6.26E-09
	Naphthalene	2.80E-05	2.77E-02	2.40E-03	3.16E-06	2.74E-07

1. TAC speciation percentages are from site-specific analytical sampling taken August 1, 2024.

2. Annual TAC Emissions (lb/yr) = TAC speciation (%) * PM_{10} Annual Emissions (tpy) * 2000 (lb/ton).

3. Average Hourly Emissions (lb/hr) = Annual Emissions (lb/yr) / 365 (days/yr) / 24 (hr/day).

Table 39. Baseline Operational: Parameters for Tugboat and Barge Engines

Parameter	Tugboat - Main Engine	Tugboat - Generator Engine	Barge - Main Engine	Barge - Generator Engine	Barge - Bow Thruster Engine
Model	Caterpillar C32	John Deere Powertech 4045TFM85	Caterpillar 3512C	Caterpillar C7.1	Caterpillar C9.3
Engine Family Name	FCPXN32.1EP3	FJDXN04.5146	ECPXN78.1AT3	GPKXN07.0BP1	GCPXN09.3EB3
Engine Power (bhp)	1,200	99	1,750	257	375
Engines per vessel	2	2	1	1	1
Operating time per trip (each) (hr/trip) [1]	2.5	8	4	24	1
Barge Capacity (tons/trip)	3,250				
Baseline Max Annual Barge Trips (trips/yr) [2]	110				
Baseline Annual Operating Time (hr/yr) [3]	275	880	440	8,760	110

1. The tugboat main engines operate for the 1.25 hour journey between the sand mine and Pier 92, for a round-trip time of 2.5 hours per trip.
A tugboat generator engine operates 8 hours per trip. When not in use, the tugboat will be on shore power.
The barge main engine operates for 4 hours during each unloading process.
The barge generator engine operates continuously. A maximum operation of 365 days per year is reflected.
The barge bow thruster engine operates during the maneuvering process into and out of the pier unloading position for approximately 30 minutes to 1 hour (total) per trip.

2. Baseline Max Annual Barge Trips (trips/yr) = Baseline Max Throughput (tons/yr) / Barge Capacity (tons/trip).

3. Baseline Annual Operating Time (hr/yr) = Operating time per trip (each) (hr/trip) * Baseline Max Annual Barge Trips (trips/yr).

Table 40. Baseline Operational: Emission Factors for Tugboat and Barge Engines

Engine	Engine Power		Emission Factors [3]			
	Total Power (bhp) [1]	Load (%) [2]	PM_{10} (g/bhp-hr)	$PM_{2.5}$ (g/bhp-hr)	NO_x (g/bhp-hr)	ROG (g/bhp-hr)
Tugboat - Main Engine	2,400	30	0.05	0.05	3.54	0.19
Tugboat - Generator Engine	198	60	0.07	0.07	3.40	0.18
Barge - Main Engine	1,750	60	0.03	0.03	3.97	0.21
Barge - Generator Engine	257	60	0.04	0.04	3.51	0.12
Barge - Bow Thruster Engine	375	60	0.05	0.05	3.65	0.11

1. Total Power (bhp) = Engine Power (bhp) * Engine per vessel.

2. Load factor per project-specific information.

3. ROG, NO_x, PM_{10}, $PM_{2.5}$ emission factors per EPA's Marine Compression-Ignition (CI) Engines certification database. EPA's Marine CI database provided a NO_x + NMHC emission factor for the main engine which is assumed to be 95% NO_x and 5% VOC based on the BAAQMD's policy, CARB Emission Factors for CI Diesel Engines (effective June 28, 2004).

Table 41. Baseline Operational: Criteria Pollutant PTE for Tugboat and Barge Engines

Engine	Annual Emissions (tpy) [1]			
	PM_{10}	$PM_{2.5}$	NO_x	ROG
Tugboat - Main Engine	0.011	0.011	0.773	0.041
Tugboat - Generator Engine	0.008	0.008	0.392	0.021
Barge - Main Engine	0.015	0.015	2.020	0.106
Barge - Generator Engine	0.067	0.067	5.230	0.178
Barge - Bow Thruster Engine	0.001	0.001	0.100	0.003
Total Annual Emissions	**0.10**	**0.10**	**8.51**	**0.35**

1. Total Annual Emissions (tpy) = Emission Factor (g/bhp-hr) * 0.00220462 (lb/g) * Total Engine Power (bhp) * Annual Operating Time (hr/yr) * Engine Load (%) / 2,000 (lb/ton).

Table 42. Baseline Operational: TAC PTE for Tugboat and Barge Engines

Source	Pollutant	Annual Emissions (lb/yr) [1,2]
Tugboat - Main Engine	Diesel Particulate Matter (DPM)	22.79
Tugboat - Generator Engine		15.47
Barge - Main Engine		30.38
Barge - Generator Engine		133.24
Barge - Bow Thruster Engine		2.85
Total Emissions		**204.72**

1. Conservatively assumes that DPM emission is equal to the $PM_{10}/PM_{2.5}$ emissions.
2. Annual Emissions (lb/yr) = $PM_{10}/PM_{2.5}$ Annual Emissions (tpy) * 2000 (lb/ton).

Table 43. Baseline Operational: Off-Road Equipment List

Equipment	Quantity	Operational Schedule [1]		Total Annual Operating Hours [2]	Fuel	Brake Horsepower (bhp) [3]	Default Load Factor [4]
		hr/day	day/yr				
Rubber Tired Loaders	1	9	254	2,286	Diesel	350	0.36
Water Truck	1	2	254	508	Diesel	150	0.38
Forklifts/Telehandler	1	0.5	254	127	Diesel	82	0.2
Man Basket	1	0.5	254	127	Diesel	46	0.31
Bobcat	1	0.5	254	127	Diesel	75	0.37

1. Operational schedule provided by the EP per "Revised Data for Pier 92 AQ-HRA Recalculations.pdf" received on 11/22/2025.
2. Total Annual Operating Hours (hr/yr) = No. of Equipment * Daily Operating Hours per Equipment (hr/day) * Operational Days (day/yr).
3. Brake horse power (bhp) for rubber tired loader, water truck and bobcat are based on actual equipment specifications. Default bhp for forklifts and man basket are based on CalEEMod 2021.1 User Guide Appendix G, Table G-12, *Horsepower and Load Factors for Construction Equipment by Fuel Type,* for forklifts and aerial lifts.
4. Default load factors are based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, *Horsepower and Load Factors for Construction Equipment by Fuel Type.*

Table 44. Baseline Operational: Off-Road Equipment Emission Factors

Equipment	Type	Year	Emission Factors (g/bhp-hr)[1]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Rubber Tired Loaders	Rubber Tired Loader (300 - 600 bhp)	2020	0.118	0.109	3.146	0.302
		2021	0.099	0.091	2.630	0.266
		2022	0.086	0.079	2.277	0.244
		2023	0.074	0.068	1.966	0.225
		2024	0.068	0.063	1.796	0.219
		Average	**0.089**	**0.082**	**2.363**	**0.251**
Water Truck	Off-Highway Trucks (100 - 175 bhp)	2020	0.140	0.129	2.668	0.315
		2021	0.116	0.107	2.289	0.284
		2022	0.091	0.084	1.856	0.246
		2023	0.085	0.078	1.736	0.242
		2024	0.073	0.067	1.542	0.229
		Average	**0.101**	**0.093**	**2.018**	**0.263**
Forklifts/Telehandler	Forklifts (75 - 100 bhp)	2020	0.302	0.278	4.067	0.450
		2021	0.261	0.240	3.683	0.402
		2022	0.216	0.199	3.285	0.352
		2023	0.182	0.168	2.981	0.316
		2024	0.157	0.145	2.751	0.292
		Average	**0.224**	**0.206**	**3.353**	**0.362**
Man Basket	Aerial Lifts (25 - 50 bhp)	2020	0.031	0.028	2.953	0.167
		2021	0.027	0.024	2.920	0.165
		2022	0.024	0.022	2.905	0.162
		2023	0.023	0.021	2.895	0.162
		2024	0.022	0.020	2.886	0.158
		Average	**0.025**	**0.023**	**2.912**	**0.163**
Bobcat	Tractors/Loaders/Backhoes (50 - 75 bhp)	2020	1.013	0.932	12.627	1.608
		2021	1.015	0.934	12.678	1.615
		2022	1.01	0.929	12.477	1.59
		2023	1.009	0.928	12.404	1.582
		2024	1.025	0.943	12.795	1.63
		Average	**1.014**	**0.933**	**12.596**	**1.605**

1. Default Emission Factors for horsepower from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Baseline emission factors are averaged across the Baseline Period (2020-2024) operational year.

Table 45. Baseline Operational: Off-Road Equipment Criteria Pollutant PTE

Equipment	Total Annual Emissions (tpy) [1]			
	PM_{10}	$PM_{2.5}$	NO_x	ROG
Rubber Tired Loaders	2.83E-02	2.60E-02	7.50E-01	7.98E-02
Water Truck	3.22E-03	2.97E-03	6.44E-02	8.40E-03
Forklifts/Telehandler	5.13E-04	4.73E-04	7.70E-03	8.32E-04
Man Basket	5.07E-05	4.59E-05	5.81E-03	3.25E-04
Bobcat	3.94E-03	3.63E-03	4.89E-02	6.24E-03
Total Annual Emissions	**3.60E-02**	**3.31E-02**	**8.77E-01**	**9.56E-02**

1. Total Annual Emissions (tpy) = Emission Factor (g/bhp-hr) * Equipment Horsepower (bhp) * Default Load Factor * 0.00220462 (lb/g) * Total Annual Operating Hours (hr/yr) / 2,000 (lb/ton)

Table 46. Baseline Operational: On-Road Vehicle

Location	Vehicle Type	Trip Length (mi/trip) [1, 2]	Annual Trips (trips/yr) [3, 4]	Annual VMT (mi/yr) [5]
Within Facility Boundary	Customer Truck	0.18	14,191	2,580
Outside Facility Boundary	Customer Truck (Emissions)	1.70	28,382	48,249
	Customer Truck (Modeling - Off Site Locations)	1.17	9,934	11,623
	Customer Truck (Modeling - Adjacent Concrete Plants)	0.17	18,448	3,136

1. Trip lengths within the Facility boundary is measured using Google Earth with the route provided by the Project Sponsor.

2. For emission calculations purposes, the customer truck trip length outside the Facility boundary is the weighted average trip length using the same approach as the transportation analysis. For modeling purposes, the trip lengths outside the Facility boundary are the distance between the Facility to the nearest interstate, reflecting other off-site delivery locations, and the distance between the Facility and the CEMEX main entrance driveway, reflecting the adjacent concrete plants.

3. Baseline Annual Trips (trips/yr) = Total actual trips from January 1, 2020, to December 31, 2024 divided by total baseline years: 70,954 trips/5 years = 14,191 trips/year. Customer truck trip within the Facility boundary is one-way only. Customer truck trip outside the Facility boundary is multiplied by 2 to account for travel to and from the site.

4. For modeling purposes, the annual trips for customer trucks outside the Facility boundary will include travel to other off-site locations (represented by travel to Freeway) and to the adjacent concrete plants. Trip ratios to off-site direct delivery locations and to adjacent concrete plants are 35% and 65%, respectively, based on the approach used in the transportation analysis.

5. Baseline Annual VMT (mi/yr) = Trip Length (mi/trip) * Baseline Annual Trips (trips/yr).

Table 47. Baseline Operational: On-Road Vehicle Emission Factors

Equipment		Year	Emission Factors			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Customer Truck	Running (g/mi) [1]	2020	2.16E-01	1.29E-01	4.14E+00	1.51E-01
		2021	1.92E-01	1.07E-01	3.45E+00	1.13E-01
		2022	1.82E-01	9.73E-02	3.18E+00	9.79E-02
		2023	1.35E-01	5.47E-02	1.54E+00	1.63E-02
		2024	1.33E-01	5.28E-02	1.39E+00	1.39E-02
		Average	**1.72E-01**	**8.81E-02**	**2.74E+00**	**7.84E-02**
	Idling (g/vehicle/day) [2]	2020	1.12E-01	1.07E-01	2.64E+01	2.01E+00
		2021	8.24E-02	7.89E-02	2.58E+01	1.95E+00
		2022	7.03E-02	6.73E-02	2.55E+01	1.93E+00
		2023	1.18E-02	1.13E-02	2.24E+01	1.81E+00
		2024	9.46E-03	9.05E-03	2.03E+01	1.81E+00
		Average	**5.72E-02**	**5.47E-02**	**2.41E+01**	**1.90E+00**

1. Transfer/Customer truck emission factors for running per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW. Baseline emission factors are averaged across the Baseline Period (2020-2024). Conservatively incorporates CARB's upward adjustment factors for EMFAC2021 - Appendix A, released in October 2025.

2. Transfer/Customer truck emission factors for truck idling per EMFAC2025 v2.0.0 for BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for IDLEX. Baseline emission factors are averaged across the Baseline Period (2020-2024). Conservatively incorporates CARB's upward adjustment factors for EMFAC2021 - Appendix A, released in October 2025.

Table 48. Baseline Operational: On-Road Vehicle Criteria Pollutant PTE

Location	Vehicle Type	Emissions Type	Annual Emission (tpy) [1, 2, 3]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Within Facility Boundary	Customer Truck	Running	4.88E-04	2.51E-04	7.79E-03	2.23E-04
		Idling	3.11E-06	2.97E-06	1.31E-03	1.03E-04
Outside Facility Boundary	Customer Truck (Emissions)	Running	9.13E-03	4.69E-03	1.46E-01	4.17E-03
		Idling	6.22E-06	5.95E-06	2.62E-03	2.07E-04
	Customer Truck (Modeling - Off Site Locations)	Running	2.20E-03	1.13E-03	3.51E-02	1.00E-03
		Idling	2.18E-06	2.08E-06	9.16E-04	7.24E-05
	Customer Truck (Modeling - Adjacent Concrete Plants)	Running	5.93E-04	3.05E-04	9.47E-03	2.71E-04
		Idling	4.04E-06	3.87E-06	1.70E-03	1.34E-04
Total Annual Emissions [4]			**9.62E-03**	**4.95E-03**	**1.57E-01**	**4.70E-03**

1. Assume one vehicle per trip and 5 mins of idling time per trip.
2. Running: Annual Emissions (tpy) = Emission Factors (g/mi) * Annual VMT (mi). Converted to units of ton.
3. Idling: Annual Emissions (tpy) = Emission Factors (g/vehicle/day) / 24 (hr/day) / 60 (mins/hr) * Idling time (mins/trip) * Annual Trips (trips/yr). Converted to units of ton.
4. Total Annual Emissions = Within Facility Boundary Emissions (Customer Truck) and Outside Facility Boundary Emissions (Customer Truck (Emissions)).

Table 49. Project Baseline: TAC PTE for Off-Road Equipment and On-Road Vehicle

Off-Road Equipment	Pollutant	Annual Emissions (lb/yr) [1]
Rubber Tired Loaders	Diesel Particulate Matter (DPM)	56.52
Water Truck		6.45
Forklifts/Telehandler		1.03
Man Basket		0.10
Bobcat		7.88
Total Annual Off-Road Emissions		**71.97**

On-Road Vehicle		Pollutant	Annual Emissions (lb/yr) [1]
Within Facility Boundary	Customer Truck	Diesel Particulate Matter (DPM)	0.98
Outside Facility Boundary	Customer Truck (Emissions)		18.27
	Customer Truck (Modeling - Off Site Locations)		4.40
	Customer Truck (Modeling - Adjacent Concrete Plants)		1.19
Total Annual On-Road Emissions [3]			**19.25**

1. Conservatively assumes that DPM emission is equal to PM_{10} emissions.
2. Annual Emissions (lb/yr) = PM_{10} Annual Emissions (tpy) * 2000 (lb/ton).
3. Total Annual Emissions = Within Facility Boundary Emissions (Customer Truck) and Outside Facility Boundary Emissions (Customer Truck (Emissions)).

Table 50. Construction Paving Emissions

Source	Area (acre/yr) [1]	Pollutant	Emission Factor (lb/acre) [2]	Annual Emissions (tpy) [3]
Paving	1.45	ROG	2.62	1.90E-03

1. Area is based on project information.
2. Emission factor per CalEEMod 2022.1 Appendix C, Section 4.9.
3. Annual Emissions (tpy) = Emission Factor (lb/acre) x Paved Area (acre/yr) x Percentage Area Paved with Asphalt (%) / 2,000 (lb/ton). Assume 100% paving is with asphalt.

Table 51. Construction: Off-Road Equipment List

Equipment	Type	Quantity [1]	Construction Schedule [1]		Total Annual Operating Hours [2]	Fuel [3]	Default Brake Horsepower (bhp) [4]	Default Load Factor [4]
			Hour/Day	Total Construction Days				
Man Lift	Aerial Lifts (25 - 50 hp)	1	8	40	320	Diesel	46	0.31
Crane	Cranes (300 - 600 hp)	1	8	40	320	Diesel	367	0.29
Gradall Forklift	Forklifts (75 - 100 hp)	1	8	140	1120	Diesel	82	0.2
Paver	Paver (75 - 100 hp)	1	8	15	120	Diesel	81	0.42
Water Truck	Off-Highway Trucks (300 - 600 hp)	1	8	15	120	Diesel	376	0.38
Bobcat	Tractors/Loaders/Backhoes (75 - 100 hp)	1	8	15	120	Diesel	84	0.37
Sheepsfoot Compactor	Rollers (25 - 50 hp)	1	8	15	120	Diesel	36	0.38
Vibratory Drum Roller	Rollers (25 - 50 hp)	1	8	30	240	Diesel	36	0.38
Motor Grader	Graders (100 - 175 hp)	1	8	20	160	Diesel	148	0.41

1. Off-Road equipment quantities and construction schedule were provided by EP on 7/31/2025, based off information provided by the Project Sponsor.

2. Total Annual Operating Hours (hr/yr) = No. of Equipment * Daily Construction Operating Hours (hr/day) * Total Construction Days (day/yr).

3. Off-road equipment are assumed to be diesel-fueled.

4. Default bhp and load factor based on CalEEMod 2022.1 User Guide Appendix G, Table G-12, Horsepower and Load Factors for Construction Equipment by Fuel Type.

Table 52. Construction: Off-Road Equipment Criteria Pollutant PTE

Equipment	Type	Emission Factors (g/bhp-hr)[1]				Annual Emissions (tpy) [2]			
		PM_{10}	$PM_{2.5}$	NO_x	ROG	PM_{10}	$PM_{2.5}$	NO_x	ROG
Man Lift	Aerial Lifts (25 - 50 hp)	0.020	0.019	2.870	0.151	1.01E-04	9.56E-05	1.44E-02	7.60E-04
Crane	Cranes (300 - 600 hp)	0.072	0.066	1.748	0.195	7.51E-04	7.13E-04	1.08E-01	5.67E-03
Gradall Forklift	Forklifts (75 - 100 hp)	0.092	0.085	2.152	0.228	4.05E-04	3.85E-04	5.81E-02	3.06E-03
Paver	Paver (75 - 100 hp)	0.119	0.110	2.450	0.229	9.00E-05	8.55E-05	1.29E-02	6.80E-04
Water Truck	Off-Highway Trucks (300 - 600 hp)	0.034	0.031	0.965	0.176	3.78E-04	3.59E-04	5.42E-02	2.85E-03
Bobcat	Tractors/Loaders/Backhoes (75 - 100 hp)	0.054	0.050	1.807	0.177	8.22E-05	7.81E-05	1.18E-02	6.21E-04
Sheepsfoot Compactor	Rollers (25 - 50 hp)	0.146	0.134	3.577	0.529	3.62E-05	3.44E-05	5.19E-03	2.73E-04
Vibratory Drum Roller	Rollers (25 - 50 hp)	0.146	0.134	3.577	0.529	7.24E-05	6.88E-05	1.04E-02	5.46E-04
Motor Grader	Graders (100 - 175 hp)	0.127	0.117	2.284	0.295	2.14E-04	2.03E-04	3.07E-02	1.62E-03
Total Annual Emissions						**2.13E-03**	**2.02E-03**	**3.06E-01**	**1.61E-02**

1. Default Emission Factors for horsepower and 2027 construction year from CalEEMod 2022.1 User Guide Appendix G, Table G-11, Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour). Per CalEEMod User Guide Appendix C, these emission factors are based upon the calendar year specified in EMFAC.

2. Total Annual Emissions (tpy) = Emission Factor (g/bhp-hr) * Equipment Horsepower (bhp) * Default Load Factor * 0.00220462 (lb/g) * Total Annual Operating Hours (hr/yr) / 2,000 (lb/ton).

Table 53. Construction: On-Road Vehicle List

Vehicle Type	Total Trips in Construction Period [1, 2, 3, 4, 5]	Trip Length (mi/trip) [6]	Annual VMT (mi/yr) [7]
Heavy Duty Trucks (Equipment/Deliveries)	18	5.64	101.52
Heavy Duty Trucks (Asphalt Delivery)	248	14.1	3496.8
Heavy Duty Trucks (Base Underlay Delivery)	410	4.9	2009.0
Construction Worker Trucks	1,400	12.26	17164.0
Soil Haul Trucks	414	5.64	2335.0

1. Total Trips in Construction Period (Equipment Delivery Trucks) is assumed to be twice the number of the construction equipment units, accounting for delivery and removal of equipment from the site. It is assumed that one heavy duty truck will be used to deliver each construction equipment and the equipment will stay on site until construction completes.

2. Total Trips in Construction Period (Asphalt Delivery Trucks) = Asphalt Required (tons) / Delivery Truck Capacity (tons/truck) x 2. Per the project description, approximately 63,330 square feet of area will be paved with asphalt. Assuming 0.039 tons of asphalt is required per square foot, 2,470 tons of asphalt is required. Each haul truck's capacity is assumed to be 20 tons/truck. It is assumed that two trips will be required to account for delivery and return to the asphalt pickup location. Therefore, 248 round trips are required.

3. Total Trips in Construction Period (Base Underlay Trucks) = Base Underlay Required (tons) / Delivery Truck Capacity (tons/truck) x 2. Per the project description, approximately 63,330 square feet of area will require base underlay. Assuming 0.0645 tons of base underlay is required per square foot, 4,085 tons of base underlay is required. Each haul truck's capacity is assumed to be 20 tons/truck. It is assumed that two trips will be required to account for delivery and return to the base underlay pickup location. Therefore, 410 round trips are required.

4. Total Trips in Construction Period (Worker Trucks) = Total Trips per Day (trips/day) x Construction Period (days). Total trips per day is assumed to be 10 trips per day and construction period is 140 days provided by Martin Marietta (5 days per week x 28 weeks).

5. Total Trips in Construction Period (Soil Haul Trucks) = Soil Excavated During Construction (cubic yards) / Haul Truck Capacity (cubic yards/truck) x 2. Per the project description, approximately 3,305 cubic yards of soil will be removed. Each haul truck's capacity is 16 cubic yards, per CalEEMod v2022.1 User Guide, Section 4.6.1. It is assumed that two trips will be required to account for delivery and return to the base underlay pickup location.

6. Default miles per trip from CalEEMod 2022.1 User Guide Appendix G, Table G-15, 2015 California Statewide Travel Demand Model Trip Lengths and Purpose Splits by Trip Type (Aggregated by Analysis Level), San Francisco Bay Area, Nonresidential Trip Length, Other-Other (Equipment/delivery trucks and soil haul trucks) and Home-Work (Construction Worker Trucks). Trip length for asphalt delivery trucks and base underlay trucks per project information.

7. Annual VMT (mi/yr) = Total Trips in Construction Period (trips/period) * Trip Length (mi/trip).

Table 54. Construction: On-Road Vehicle Emission Factors

Vehicle Type			Emission Factors [7]			
			PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	T7 Single Other Class 8	Running (g/mi) [1]	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Heavy Duty Trucks (Asphalt Delivery)	T7 Single Other Class 8	Running (g/mi) [1]	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Heavy Duty Trucks (Base Underlay Delivery)	T7 Single Other Class 8	Running (g/mi) [1]	1.34E-01	5.12E-02	8.98E-01	1.25E-02
	T7 Single Other Class 8	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	3.05E+00	0.00E+00
Construction Worker Trucks	LDT2	Running (g/mi) [3]	2.39E-02	1.22E-02	6.50E-02	2.79E-02
	LDT2	Start-Up (g/trip) [4]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soil Haul Trucks	T7 Single Dump Class 8	Running (g/mi) [5]	1.33E-01	5.05E-02	9.12E-01	1.10E-02
	T7 Single Dump Class 8	Start-Up (g/trip) [6]	0.00E+00	0.00E+00	3.05E+00	0.00E+00

1. Heavy Duty Trucks (Equipment/Delivery, Asphalt Delivery, and Base Underlay Delivery) emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Other Class 8 for RUNEX, PMTW, and PMBW.

2. Heavy Duty Trucks (Equipment/Delivery, Asphalt Delivery, and Base Underlay Delivery) emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Other Class 8 for STREX.

3. Construction Worker Trucks emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category LDT2 for RUNEX, PMTW, and PMBW.

4. Construction Worker Trucks emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category LDT2 for STREX.

5. Soil Haul Trucks emission factors for running per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for RUNEX, PMTW, and PMBW.

6. Soil Haul Trucks emission factors for start-up per EMFAC2025 v2.0.0 for Calendar Year 2027, BAAQMD Region, Vehicle Category T7 Single Dump Class 8 for STREX.

7. Conservatively incorporates CARB's upward adjustment factors for EMFAC2021 - Appendix A, released in October 2025.

Table 55. Construction: On-Road Vehicle Criteria Pollutant PTE

Vehicle Type		Annual Emissions (tpy) [1, 2]			
		PM_{10}	$PM_{2.5}$	NO_x	ROG
Heavy Duty Trucks (Equipment/Deliveries)	Running (g/mi) [1]	1.50E-05	5.73E-06	1.00E-04	1.40E-06
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	6.06E-05	0.00E+00
Heavy Duty Trucks (Asphalt Delivery)	Running (g/mi) [1]	5.18E-04	1.97E-04	3.46E-03	4.83E-05
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	8.35E-04	0.00E+00
Heavy Duty Trucks (Base Underlay Delivery)	Running (g/mi) [1]	2.97E-04	1.13E-04	1.99E-03	2.77E-05
	Start-Up (g/trip) [2]	0.00E+00	0.00E+00	1.38E-03	0.00E+00
Construction Worker Trucks	Running (g/mi) [3]	4.53E-04	2.31E-04	1.23E-03	5.28E-04
	Start-Up (g/trip) [4]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Soil Haul Trucks	Running (g/mi) [5]	3.42E-04	1.30E-04	2.35E-03	2.82E-05
	Start-Up (g/trip) [6]	0.00E+00	0.00E+00	1.39E-03	0.00E+00
Total Annual Emissions		**1.63E-03**	**6.77E-04**	**1.28E-02**	**6.34E-04**

1. Running: Annual Emissions (tpy) = Emission Factor (g/mi) * Annual VMT (mi/yr). Converted to units of ton.

2. Start-Up: Annual Emissions (tpy) = Emission Factor (g/trip) * Total Trips per Year (trips/yr). Converted to units of ton.

Table 56. Construction: Off-Road Equipment and On-Road Vehicle TAC PTE

Off-Road Equipment	Pollutant	Annual Emissions (lb/yr) [1]
Man Lift	Diesel Particulate Matter (DPM)	0.20
Crane		1.50
Gradall Forklift		0.81
Paver		0.18
Water Truck		0.76
Bobcat		0.16
Sheepsfoot Compactor		0.07
Vibratory Drum Roller		0.14
Motor Grader		0.43
Total Annual Off-Road Emissions		**4.26**
On-Road Vehicle	**Pollutant**	**Annual Emissions (lb/yr) [1]**
Heavy Duty Trucks (Equipment/Deliveries)	Diesel Particulate Matter (DPM)	7.52E-09
Heavy Duty Trucks (Asphalt Delivery)		2.59E-07
Heavy Duty Trucks (Base Underlay Delivery)		1.49E-07
Construction Worker Trucks		2.26E-07
Soil Haul Trucks		1.71E-07
Total Annual On-Road Emissions		**8.13E-07**

1. Annual Emissions (lb/yr) = PM_{10} Annual Emissions (tpy) * 2000 (lb/ton). Conservatively assumes that DPM emission is equal to the PM_{10} emissions.

Table 57. Construction Excavation Activity Emissions

Source	Excavation Duration (hr/yr) [1]	Uncontrolled Emission Factors (lb/hr) [2]		Annual Emissions (tpy) [3]	
		PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Excavation	80	0.75	0.41	0.03	0.02

1. Excavation duration per project information provided by Project Sponsor.
2. Emission factor per CalEEMod 2022.1 Appendix C, Section 4.4.2. Bulldozing emission factor is used as an estimation for excavation.

$$EF_{TSP} = \frac{C_{TSP} \times (s^{1.2})}{M^{1.3}} \qquad EF_{PM15} = \frac{C_{PM15} \times (s^{1.5})}{M^{1.4}}$$

$$EF_{PM2.5} = EF_{TSP} \times F_{PM2.5} \qquad EF_{PM10} = EF_{PM15} \times F_{PM10}$$

where:

EF = Emission factor, (lb/hr)

C = arbitrary coefficient used by AP-42

C_{TSP} = 5.7

C_{PM15} = 1

M = 7.9 material moisture content (%). CalEEMod default value is 7.9%.

s = 6.9 material silt content (%). CalEEMod default value is 6.9%

F_{PM10} = 0.75 PM_{10} scaling factor. The CalEEMod default value is 0.75.

$F_{PM2.5}$ = 0.105 $PM_{2.5}$ scaling factor. The CalEEMod default value is 0.105

3. Annual Emissions (tpy) = Emission Factor (lb/hr) * Excavation Duration (hr/yr) / 2,000 (lb/ton).

Table 58. Construction Grading Above Grade Emissions

Description	Grading Area (acre) [1]	Emission Factor (lb/VMT) [2]		Vehicle Miles Traveled (miles/year) [3,4]	Annual Emissions (tpy) [5]	
		PM_{10}	$PM_{2.5}$		PM_{10}	$PM_{2.5}$
Grading	1.50	1.54	0.17	1.03	7.95E-04	8.59E-05

1. Grading area per project information provided by Project Sponsor.

2. Emission factors and constants per CalEEMod 2022.1 Appendix C, Section 4.4.1.

$$EF_{TSP} = 0.04 * (S^{2.5}) \qquad EF_{PM15} = 0.051 * (S^{2.0})$$

$$EF_{PM2.5} = EF_{TSP} \times F_{PM2.5} \qquad EF_{PM10} = EF_{PM15} \times F_{PM10}$$

where:

EF = Emission factor, (lb/VMT)

S = 7.1 mean vehicle speed, mph. The AP-42 default value is 7.1 mph

$F_{PM2.5}$ = 0.031 $PM_{2.5}$ scaling factor. The AP-42 default value is 0.031

F_{PM10} = 0.6 PM_{10} scaling factor. The AP-42 default value is 0.6

3. Vehicle Miles Traveled calculation per CalEEMod Appendix C, Section 4.4.1.

$$VMT = \frac{A_s}{W_b} \times \frac{43{,}560\ (\frac{sqft}{acre})}{5{,}280\ (\frac{ft}{mile})}$$

where:

VMT = vehicle miles traveled, (mile)

A_s = acreage of the grading site, (acre)

W_b = blade width of the grading equipment, (ft)

4. Default blade width 12 ft per CalEEMod 2022.1 Appendix C, Section 4.4.1.

5. Annual Emissions (tpy) = Emission Factor (lb/VMT) x VMT (miles/year) / 2,000 (lb/ton).

Table 59. Construction: Fugitive Dust Criteria Pollutant PTE from Paved Roads

Scenario	Emission Factor (lb/VMT) [1]		Annual Emissions (tpy) [2]	
	PM_{10}	$PM_{2.5}$	PM_{10}	$PM_{2.5}$
Equipment Delivery Trucks	1.44E-04	3.53E-05	7.31E-06	1.79E-06
Asphalt Delivery Trucks	1.25E-04	3.07E-05	2.19E-04	5.37E-05
Base Underlay Trucks	1.49E-04	3.65E-05	1.49E-04	3.66E-05
Construction Worker Trucks	1.27E-04	3.12E-05	1.09E-03	2.68E-04
Soil Haul Trucks	1.44E-04	3.53E-05	1.68E-04	4.12E-05
Total Annual Emissions [5]			**0.0016**	**0.0004**

1. Fugitive emissions estimates for construction vehicle travel on paved roads to/from Pier 92 were calculated based on AP-42 Chapter 13.2.1 (updated January 2011) Equation 2 as follows:

$$E = k(sL)^{0.91} \times (W)^{1.02} \times (1 - \frac{P}{4N})$$

Where: E = Size-specific emission factor (lb/VMT)

	PM_{10}	$PM_{2.5}$	
k =	0.0022	0.00054	Particulate size multiplier (lb/VMT) per Table 13.2.1-1
$sL_{\text{Equipment Delivery Truck}}$ =	0.020		Road surface silt loading (g/m2) is the distance-weighted average silt loading from the table below. This includes travel on Amador Street, Cargo Way, 3rd Street, 25th Street, and the Freeway. The remainder of distance traveled by the construction on-road vehicles are represented using the Freeway silt loading.
$sL_{\text{Asphalt Delivery Truck}}$ =	0.017		
$sL_{\text{Base Underlay Truck}}$ =	0.020		
$sL_{\text{Construction Worker Truck}}$ =	0.017		
$sL_{\text{Soil Haul Truck}}$ =	0.020		

Section	Distance (ft)	sL (g/m^2)	Notes
Amador Street (North/South bound)	263	0.32	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Local Streets.
Amador Street (East/West bound)	2,317	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Cargo Way	278	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
3rd St	2,425	0.015	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Freeways/Roads with >10,000 AADT.
25th St	895	0.032	Distance per Google Earth. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Major Streets.
Freeway (Equipment Delivery Trucks)	23,601	0.015	Distance is the difference between Off-Site Travel Distance and the distance between Facility to the Freeway. Silt Loading per Bay Area Air District CEQA Air Quality Guidelines, Appendix E, Table 22 for Freeways.
Freeway (Asphalt Delivery Trucks)	68,270	0.015	
Freeway (Base Underlay Delivery Trucks)	19,694	0.015	
Freeway (Construction Worker Trucks)	58,555	0.015	
Freeway (Soil Haul Trucks)	23,601	0.015	

W =	2.4	Mean vehicle weight (tons) on paved roadway, per default from CalEEMod, Appendix C, Section 5.1.4.
P =	65	Number of days with at least 0.01 in of precipitation per year, based on AP-42 Figure 13.2.1-2.
N =	365	Number of days in the averaging period

2. Annual Emissions (tpy) = Emission Factor (lb/VMT) * Annual VMT (mi/yr) / 2,000 (lb/ton).

APPENDIX C. AERMOD MODELING INPUTS

Model Input Summary

Model Name	Control						Output			Receptors		Sources		
	Title	Pollutant	Special Analysis	Regulatory	Flag point Height (m)	AERSURFACE Urban?	Options		Plot Files	Receptor Grid	Boundary	Point Sources	Area Sources	Volume Sources
P92 Constr HRA	Martin Marietta Northern California Aggregates, LLC Pier 92 Modernization and Plant Replacement Construction HRA	Other	-	User Defined / Use regulatory defaults	1.8	URBAN	- Receptor, day and maximum tables - Plot (contour files)	1st high - period	Source specific - period	Project Receptor Grid	Project Boundary	None	Construction Area	None
P92 Constr PM25	Martin Marietta Northern California Aggregates, LLC Pier 92 Modernization and Plant Replacement Construction Annual Avg PM2.5	PM25	Disable Special Analysis					1st high - period	All - period	Project Receptor Grid	Project Boundary	None	Construction Area	None
P92 Baseline HRA	Martin Marietta Northern California Aggregates, LLC Pier 92 Modernization and Plant Replacement Baseline HRA Model	Other	-					1st high - 1 hr, period	Source specific - 1hr, period	Baseline Receptor Grid	Baseline Boundary	Baseline Point Sources	Baseline Area Sources	Baseline Volume Sources
P92 Baseline PM25	Martin Marietta Northern California Aggregates, LLC Pier 92 Modernization and Plant Replacement Baseline Annual Avg PM2.5	PM25	Disable Special Analysis					1st high - 1 hr, period	All and Source specific - period	Baseline Receptor Grid	Baseline Boundary	Baseline Point Sources	Baseline Area Sources	Baseline Volume Sources
P92 Project HRA	Martin Marietta Northern California Aggregates, LLC Pier 92 Modernization and Plant Replacement Project HRA Model	Other	-					1st high - 1 hr, period	Source specific - 1hr, period	Project Receptor Grid	Project Boundary	Project Point Sources	Project Area Sources	Project Volume Sources
P92 Project PM25	Martin Marietta Northern California Aggregates, LLC Pier 92 Modernization and Plant Replacement Project Annual Avg PM2.5	PM25	Disable Special Analysis					1st high - 1 hr, period	All and Source specific - period	Project Receptor Grid	Project Boundary	Project Point Sources	Project Area Sources	Project Volume Sources

AERMOD Modeling Parameters - Construction Area Source

AERMOD Source Group	Source Description	Area (m^2)	HRA Unit Rate (g/s-m^2)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate (g/s-m^2)	Release Height (m)	Initial Vertical Dimension (m)	Notes
CONSTR	Construction Equipment	12446.75	8.03E-05	1.87E-02	4.31E-08	1.30	1.21	Construction equipment will be modeled as a single area source covering the construction area. The release height and the initial vertical dimension are per Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks.

Construction Polygon Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)
1	CONSTR	Construction Equipment	554809.7	4177850.4	4.94	8.03E-05	4.31E-08	1.30	1.21

AERMOD Modeling Parameters - Baseline Operation Point Sources

AERMOD Source Group	Source Description	HRA Unit Rate (g/s)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate (g/s)	Stack Height (m)	Stack Temp (K)	Stack Velocity (m/s)	Stack Diameter (m)	Notes
BH	Barge Hoteling	1	7.44E-02	2.14E-03	15.2	573.15	20.00	0.30	Parameters are from the San Francisco Citywide HRA Table 8, towboats at-berth.
TI	Truck Idling	1	2.97E-06	8.55E-08	2.55	644	17.80	0.305	Parameters are from the San Francisco Citywide HRA Section 3.4. The release height reflects the that of on-road heavy-duty trucks, which is based on a vehicle height of 3.0 meters. All other point source parameters are from Table 7 for sources that have incomplete modeling information. Note that the Stack Diameter of 3.05 m is assumed to be a typo of the conversion of 1 feet in the parentheses.

AERMOD Modeling Parameters - Baseline Operation Area Sources

AERMOD Source Group	Source Description	Area (m^2)	HRA Unit Rate ($g/s\text{-}m^2$)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate ($g/s\text{-}m^2$)	Release Height (m)	Initial Vertical Dimension (m)	Road Length (m)	Percent Road Length (%)	Notes
RMS	Raw Material Stockpile	1771	5.65E-04	3.83E-03	6.22E-08	4.57	2.13	-	-	Per NSSGA section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per NSSGA section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. Baseline raw material stockpile height is assumed to be 30 ft.
PSS	Product Sand Stockpile	934	1.07E-03	1.98E-03	6.10E-08	4.57	2.13	-	-	Per NSSGA section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per NSSGA section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. Baseline product sand stockpile height is assumed to be 30 ft.
OMS	Oversize Material Stockpile	70	1.43E-02	1.17E-04	4.79E-08	4.57	2.13	-	-	Per NSSGA section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per NSSGA section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. Baseline oversized material stockpile height is assumed to be 30 ft.
OREE	Off-Road Equipment Exhaust	11341	8.82E-05	7.11E-03	1.80E-08	1.30	1.21	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks.
OTTHDA	Off-site Transfer Truck Highway Dust Area	22778	4.39E-05	3.71E-03	4.68E-09	3.40	3.16	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
OTTHEA	Off-site Transfer Truck Highway Exhaust Area	22778	4.39E-05	1.13E-03	1.43E-09	2.55	2.37	-	-	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
OTTCPDA	Off-site Transfer Truck Concrete Plant Dust Area	3341	2.99E-04	2.80E-03	2.41E-08	3.40	3.16	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
OTTCPEA	Off-site Transfer Truck Concrete Plant Exhaust Area	3341	2.99E-04	3.09E-04	2.66E-09	2.55	2.37	-	-	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
UPLDA	Unpaved Loader Dust Area	197	5.09E-03	6.76E-02	1.43E-06	1.30	1.21	25	14.50%	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks.
UPLEA	Unpaved Loader Exhaust Area	197	5.09E-03	2.60E-02	5.52E-07	3.20	2.97	25	14.50%	Per Appendix E Table 8. Source release height represents equipment-specific exhaust height above ground multiplied by a factor of 1.7 to account for the source's motion and 0.5. The exhaust emissions are surface-based sources; therefore, the initial vertical dimension is the plume height divided by 2.15.
UPTTDA_1	Unpaved Transfer Truck Dust Area 1	40	2.50E-02	9.88E-02	3.02E-06	3.40	3.16	9.16	4.26%	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.

AERMOD Modeling Parameters - Baseline Operation Area Sources

AERMOD Source Group	Source Description	Area (m^2)	HRA Unit Rate ($g/s\text{-}m^2$)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate ($g/s\text{-}m^2$)	Release Height (m)	Initial Vertical Dimension (m)	Road Length (m)	Percent Road Length (%)	Notes
UPTTEA_1	Unpaved Transfer Truck Exhaust Area 1	40	2.50E-02	2.51E-04	6.43E-09	2.55	2.37	9.16	3.57%	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
UPTTDA_2	Unpaved Transfer Truck Dust Area 2	318	3.14E-03	9.88E-02	2.69E-06	3.40	3.16	64.8	30.15%	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
UPTTEA_2	Unpaved Transfer Truck Exhaust Area 2	318	3.14E-03	2.51E-04	5.72E-09	2.55	2.37	64.8	25.24%	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
PTTDA	Paved Transfer Truck Dust Area	186	5.37E-03	1.05E-02	1.62E-06	3.40	3.16	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
PTTEA	Paved Transfer Truck Exhaust Area	186	5.37E-03	2.51E-04	6.31E-09	2.55	2.37	41.8	16.28%	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.

AERMOD Modeling Parameters - Baseline Operation Volume Sources

AERMOD Source Group	Source Description	# of Sources	HRA Unit Rate (g/s)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate (g/s)	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)	Exclusion Zone	Road Length (m)	Percent Road Length (%)	Notes
TP1	TP 1 – Off-loaded Pile to Hopper	1	1.0	2.59E-02	7.46E-04	3.05	0.81	1.77	-	-	-	Per NSSGA section 5.3.6.5 guidance for Truck unloading and loader equipment specifications.
TP2	TP 2 – Hopper to Conveyor	1	1.0	7.78E-03	2.24E-04	1.59	0.18	0.25	-	-	-	Per NSSGA section 5.3.2 for single, elevated, conveyor transfer points. The release height is equal to the distance from the ground to the center of the source, the initial lateral dimension is equal to the width of the conveyor divided by 4.3, and the initial vertical dimension is equal to the plume height (the total drop distance) divided by 4.3.
TP3	TP 3 – Conveyor to Scalping Screen	1	1.0	7.78E-03	2.24E-04	6.25	0.18	2.06	-	-	-	Per NSSGA section 5.3.2 for single, elevated, conveyor transfer points. The release height is equal to the distance from the ground to the center of the source, the initial lateral dimension is equal to the width of the conveyor divided by 4.3, and the initial vertical dimension is equal to the plume height (the total drop distance) divided by 4.3.
UPLRD	Unpaved Loader Two-Way Road Dust	4	0.3	6.76E-02	2.05E-04	1.30	9.33	1.21	21.07	72.8	42.23%	Same release height and initial vertical dimension as Unpaved Loader Dust Area. Per Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for a two lane roadway is the road width plus 6 meters over 2.15. The road width is estimated in Google Earth.
UPLRE	Unpaved Loader Two-Way Road Exhaust	4	0.3	2.60E-02	7.91E-05	3.20	9.33	2.97	21.07	72.8	42.23%	Same release height and initial vertical dimension as Unpaved Loader Exhaust Area. Per Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for a two lane roadway is the road width plus 6 meters over 2.15. The road width is estimated in Google Earth.
UPTTRD	Unpaved Transfer Truck One-Way Road Dust	16	0.1	9.88E-02	1.16E-04	3.40	4.09	3.16	9.79	141	65.59%	Same release height and initial vertical dimension as Unpaved Transfer Truck Dust Area. Per EPA Haul Road Workgroup Final Report, the initial lateral dimension for one lane roadways is the vehicle width plus 6 meters over 2.15. The Transfer Truck vehicle width is approximated to be equal to the wheel wash width, 110 inches.

AERMOD Modeling Parameters - Baseline Operation Volume Sources

AERMOD Source Group	Source Description	# of Sources	HRA Unit Rate (g/s)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate (g/s)	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)	Exclusion Zone	Road Length (m)	Percent Road Length (%)	Notes
UPTTRE	Unpaved Transfer Truck One-Way Road Exhaust	16	0.1	2.51E-04	2.48E-07	2.55	4.09	2.37	9.79	141	54.92%	Same release height and initial vertical dimension as Unpaved Transfer Truck Dust Area. Per EPA Haul Road Workgroup Final Report, the initial lateral dimension for one lane roadways is the vehicle width plus 6 meters over 2.15. The Transfer Truck vehicle width is approximated to be equal to the wheel wash width, 110 inches.
BT	Barge Traffic	777	0.0013	2.80E-02	1.04E-06	15.20	23.26	3.53	-	-	-	Parameters are from the San Francisco Citywide HRA Table 8. Release height and point source parameters reflect Assist Tugs in Routes (near) mode.
UPLPPD	Unpaved Loader Product Pile Dust	6	0.1667	6.76E-02	1.40E-04	1.30	5.64	1.21	13.13	74.6	43.27%	Same release height and initial vertical dimension as Unpaved Loader Dust Area. Per Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for a two lane roadway is the road width plus 6 meters over 2.15. The road width is estimated in Google Earth.
UPLPPE	Unpaved Loader Product Pile Exhaust	6	0.1667	2.60E-02	5.40E-05	3.20	5.64	2.97	13.13	74.6	43.27%	Same release height and initial vertical dimension as Unpaved Loader Exhaust Area. Per Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for a two lane roadway is the road width plus 6 meters over 2.15. The road width is estimated in Google Earth.

Baseline Point Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Stack Height	Stack Temp	Stack Velocity	Stack Diameter
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(K)	(m/s)	(m)
1	BH	Barge Hoteling	554913.2	4177966.8	0.67	1.00	2.14E-03	15.20	573.15	20.00	0.30
2	TI	Truck Idling	554845.7	4177785.6	5.79	1.00	8.55E-08	2.55	644.00	17.80	0.305

Baseline Circle Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Radius	Vertices	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	-	(m)
1	OMS	Oversize Material Stockpile	554910.3	4177805	5.08	1.43E-02	4.79E-08	4.57	4.7191	20	2.13

Baseline Polygon Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)
1	RMS	Raw Material Stockpile	554805.6	4177875.4	4.01	5.65E-04	6.22E-08	4.57	2.13
2	PSS	Product Sand Stockpile	554841.3	4177816.2	5.56	1.07E-03	6.10E-08	4.57	2.13
3	OTTHDA	Off-site Transfer Truck Highway Dust Area	554782.1	4177759.6	6.13	4.39E-05	4.68E-09	3.40	3.16
4	OTTHEA	Off-site Transfer Truck Highway Exhaust Area	554782.1	4177759.6	6.13	4.39E-05	1.43E-09	2.55	2.37
5	PTTDA	Paved Transfer Truck Dust Area	554804.7	4177778.7	6.17	5.37E-03	1.62E-06	3.40	3.16
6	PTTEA	Paved Transfer Truck Exhaust Area	554804.7	4177778.7	6.17	5.37E-03	6.31E-09	2.55	2.37
7	UPTTDA_2	Unpaved Transfer Truck Dust Area 2	554847.2	4177781.1	5.89	3.14E-03	2.69E-06	3.40	3.16
8	UPTTEA_2	Unpaved Transfer Truck Exhaust Area 2	554847.2	4177781.1	5.89	3.14E-03	5.72E-09	2.55	2.37
9	OREE	Off-Road Equipment Exhaust	554802.1	4177849.7	4.72	8.82E-05	1.80E-08	1.30	1.21
10	OTTCPDA	Off-site Transfer Truck Concrete Plant Dust Area	554766.7	4177825.8	4.83	2.99E-04	2.41E-08	3.40	3.16
11	OTTCPEA	Off-site Transfer Truck Concrete Plant Exhaust Area	554766.7	4177825.8	4.83	2.99E-04	2.66E-09	2.55	2.37

Baseline Rectangle Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	X Length	Y Length	Angle	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)	-	(m)
1	UPTTDA_1	Unpaved Transfer Truck Dust Area 1	554799.5	4177834.7	5.24	2.50E-02	3.02E-06	3.40	4.09	9.79	88.7	3.16
2	UPLDA	Unpaved Loader Dust Area	554798.6	4177839.6	5.15	5.09E-03	1.43E-06	1.30	21.07	9.33	34.3	1.21
3	UPTTEA_1	Unpaved Transfer Truck Exhaust Area 1	554799.5	4177834.7	5.24	2.50E-02	6.43E-09	2.55	4.09	9.79	88.7	2.37
4	UPLEA	Unpaved Loader Exhaust Area	554798.6	4177839.6	5.15	5.09E-03	5.52E-07	3.20	21.07	9.33	34.3	2.97

Baseline Volume Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
1	TP1	TP 1 – Off-loaded Pile to Hopper	554892.9	4177835.9	4.94	1	7.46E-04	3.05	0.81	1.77
2	TP2	TP 2 – Hopper to Conveyor	554893.5	4177833.5	4.98	1	2.24E-04	1.59	0.18	0.25
3	TP3	TP 3 – Conveyor to Scalping Screen	554894.3	4177821	4.82	1	2.24E-04	6.25	0.18	2.06
4	UPLRD1	Unpaved Loader Two-Way Road Dust	554824.6	4177832	5.2	0.25	2.05E-04	1.30	9.33	1.21
5	UPLRD2	Unpaved Loader Two-Way Road Dust	554844.5	4177829.2	5.53	0.25	2.05E-04	1.30	9.33	1.21
6	UPLRD3	Unpaved Loader Two-Way Road Dust	554864.2	4177832.1	5.36	0.25	2.05E-04	1.30	9.33	1.21
7	UPLRD4	Unpaved Loader Two-Way Road Dust	554883.9	4177835.8	5.36	0.25	2.05E-04	1.30	9.33	1.21
8	UPLRE1	Unpaved Loader Two-Way Road Exhaust	554824.6	4177832	5.2	0.25	7.91E-05	3.20	9.33	2.97
9	UPLRE2	Unpaved Loader Two-Way Road Exhaust	554844.5	4177829.2	5.53	0.25	7.91E-05	3.20	9.33	2.97
10	UPLRE3	Unpaved Loader Two-Way Road Exhaust	554864.2	4177832.1	5.36	0.25	7.91E-05	3.20	9.33	2.97
11	UPLRE4	Unpaved Loader Two-Way Road Exhaust	554883.9	4177835.8	5.36	0.25	7.91E-05	3.20	9.33	2.97
12	UPTTRD1	Unpaved Transfer Truck One-Way Road Dust	554812.9	4177830.8	5.34	6.25E-02	1.16E-04	3.40	4.09	3.16
13	UPTTRD2	Unpaved Transfer Truck One-Way Road Dust	554819.3	4177825.4	5.37	6.25E-02	1.16E-04	3.40	4.09	3.16
14	UPTTRD3	Unpaved Transfer Truck One-Way Road Dust	554821.1	4177816.8	5.45	6.25E-02	1.16E-04	3.40	4.09	3.16
15	UPTTRD4	Unpaved Transfer Truck One-Way Road Dust	554822.6	4177808.2	5.48	6.25E-02	1.16E-04	3.40	4.09	3.16
16	UPTTRD5	Unpaved Transfer Truck One-Way Road Dust	554824.7	4177799.6	5.5	6.25E-02	1.16E-04	3.40	4.09	3.16
17	UPTTRD6	Unpaved Transfer Truck One-Way Road Dust	554829.4	4177792.5	5.72	6.25E-02	1.16E-04	3.40	4.09	3.16
18	UPTTRD7	Unpaved Transfer Truck One-Way Road Dust	554837.3	4177788.7	5.76	6.25E-02	1.16E-04	3.40	4.09	3.16
19	UPTTRD8	Unpaved Transfer Truck One-Way Road Dust	554845.6	4177785.7	5.79	6.25E-02	1.16E-04	3.40	4.09	3.16
20	UPTTRD9	Unpaved Transfer Truck One-Way Road Dust	554854.2	4177784.0	5.94	6.25E-02	1.16E-04	3.40	4.09	3.16
21	UPTTRD10	Unpaved Transfer Truck One-Way Road Dust	554863.0	4177783.8	6.34	6.25E-02	1.16E-04	3.40	4.09	3.16
22	UPTTRD11	Unpaved Transfer Truck One-Way Road Dust	554871.7	4177784.8	6.88	6.25E-02	1.16E-04	3.40	4.09	3.16
23	UPTTRD12	Unpaved Transfer Truck One-Way Road Dust	554880.1	4177787.4	6.26	6.25E-02	1.16E-04	3.40	4.09	3.16
24	UPTTRD13	Unpaved Transfer Truck One-Way Road Dust	554887.8	4177791.6	5.1	6.25E-02	1.16E-04	3.40	4.09	3.16
25	UPTTRD14	Unpaved Transfer Truck One-Way Road Dust	554895.8	4177795.0	5.11	6.25E-02	1.16E-04	3.40	4.09	3.16
26	UPTTRD15	Unpaved Transfer Truck One-Way Road Dust	554904.5	4177796.0	5.16	6.25E-02	1.16E-04	3.40	4.09	3.16
27	UPTTRD16	Unpaved Transfer Truck One-Way Road Dust	554910.8	4177791.0	5.33	6.25E-02	1.16E-04	3.40	4.09	3.16
28	UPTTRE1	Unpaved Transfer Truck One-Way Road Exhaust	554812.9	4177830.8	5.34	6.25E-02	2.48E-07	2.55	4.09	2.37
29	UPTTRE2	Unpaved Transfer Truck One-Way Road Exhaust	554819.3	4177825.4	5.37	6.25E-02	2.48E-07	2.55	4.09	2.37
30	UPTTRE3	Unpaved Transfer Truck One-Way Road Exhaust	554821.1	4177816.8	5.45	6.25E-02	2.48E-07	2.55	4.09	2.37
31	UPTTRE4	Unpaved Transfer Truck One-Way Road Exhaust	554822.6	4177808.2	5.48	6.25E-02	2.48E-07	2.55	4.09	2.37
32	UPTTRE5	Unpaved Transfer Truck One-Way Road Exhaust	554824.7	4177799.6	5.5	6.25E-02	2.48E-07	2.55	4.09	2.37
33	UPTTRE6	Unpaved Transfer Truck One-Way Road Exhaust	554829.4	4177792.5	5.72	6.25E-02	2.48E-07	2.55	4.09	2.37
34	UPTTRE7	Unpaved Transfer Truck One-Way Road Exhaust	554837.3	4177788.7	5.76	6.25E-02	2.48E-07	2.55	4.09	2.37
35	UPTTRE8	Unpaved Transfer Truck One-Way Road Exhaust	554845.6	4177785.7	5.79	6.25E-02	2.48E-07	2.55	4.09	2.37
36	UPTTRE9	Unpaved Transfer Truck One-Way Road Exhaust	554854.2	4177784.0	5.94	6.25E-02	2.48E-07	2.55	4.09	2.37
37	UPTTRE10	Unpaved Transfer Truck One-Way Road Exhaust	554863.0	4177783.8	6.34	6.25E-02	2.48E-07	2.55	4.09	2.37
38	UPTTRE11	Unpaved Transfer Truck One-Way Road Exhaust	554871.7	4177784.8	6.88	6.25E-02	2.48E-07	2.55	4.09	2.37
39	UPTTRE12	Unpaved Transfer Truck One-Way Road Exhaust	554880.1	4177787.4	6.26	6.25E-02	2.48E-07	2.55	4.09	2.37
40	UPTTRE13	Unpaved Transfer Truck One-Way Road Exhaust	554887.8	4177791.6	5.1	6.25E-02	2.48E-07	2.55	4.09	2.37
41	UPTTRE14	Unpaved Transfer Truck One-Way Road Exhaust	554895.8	4177795.0	5.11	6.25E-02	2.48E-07	2.55	4.09	2.37
42	UPTTRE15	Unpaved Transfer Truck One-Way Road Exhaust	554904.5	4177796.0	5.16	6.25E-02	2.48E-07	2.55	4.09	2.37
43	UPTTRE16	Unpaved Transfer Truck One-Way Road Exhaust	554910.8	4177791.0	5.33	6.25E-02	2.48E-07	2.55	4.09	2.37
44	BT1	Barge Traffic	568307.9	4178548.1	-0.29	1.29E-03	1.04E-06	15.20	23.26	3.53
45	BT2	Barge Traffic	568318.5	4178597	-0.29	1.29E-03	1.04E-06	15.20	23.26	3.53
46	BT3	Barge Traffic	568329	4178645.9	-0.29	1.29E-03	1.04E-06	15.20	23.26	3.53
47	BT4	Barge Traffic	568339.6	4178694.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
48	BT5	Barge Traffic	568350.2	4178743.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
49	BT6	Barge Traffic	568360.8	4178792.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
50	BT7	Barge Traffic	568371.3	4178841.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
51	BT8	Barge Traffic	568381.9	4178890.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
52	BT9	Barge Traffic	568392.5	4178939.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
53	BT10	Barge Traffic	568403	4178988	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
54	BT11	Barge Traffic	568413.6	4179036.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
55	BT12	Barge Traffic	568424.2	4179085.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
56	BT13	Barge Traffic	568434.8	4179134.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
57	BT14	Barge Traffic	568430.3	4179184.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
58	BT15	Barge Traffic	568423.8	4179233.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
59	BT16	Barge Traffic	568417.4	4179283.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
60	BT17	Barge Traffic	568410.9	4179332.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
61	BT18	Barge Traffic	568404.4	4179382.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
62	BT19	Barge Traffic	568398	4179432	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
63	BT20	Barge Traffic	568391.5	4179481.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
64	BT21	Barge Traffic	568385	4179531.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
65	BT22	Barge Traffic	568378.6	4179580.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
66	BT23	Barge Traffic	568372.1	4179630.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
67	BT24	Barge Traffic	568365.6	4179679.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
68	BT25	Barge Traffic	568359.1	4179729.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
69	BT26	Barge Traffic	568352.7	4179779	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
70	BT27	Barge Traffic	568346.2	4179828.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
71	BT28	Barge Traffic	568339.7	4179878.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
72	BT29	Barge Traffic	568321.1	4179921.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
73	BT30	Barge Traffic	568285.8	4179957.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
74	BT31	Barge Traffic	568250.4	4179992.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
75	BT32	Barge Traffic	568215	4180027.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
76	BT33	Barge Traffic	568179.7	4180063.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
77	BT34	Barge Traffic	568144.3	4180098.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
78	BT35	Barge Traffic	568109	4180133.9	0.92	1.29E-03	1.04E-06	15.20	23.26	3.53
79	BT36	Barge Traffic	568073.6	4180169.2	1.81	1.29E-03	1.04E-06	15.20	23.26	3.53
80	BT37	Barge Traffic	568038.2	4180204.6	2.6	1.29E-03	1.04E-06	15.20	23.26	3.53
81	BT38	Barge Traffic	567999.8	4180236.1	3.54	1.29E-03	1.04E-06	15.20	23.26	3.53
82	BT39	Barge Traffic	567957.8	4180263.3	4.83	1.29E-03	1.04E-06	15.20	23.26	3.53
83	BT40	Barge Traffic	567915.8	4180290.4	4.84	1.29E-03	1.04E-06	15.20	23.26	3.53
84	BT41	Barge Traffic	567873.8	4180317.6	5.04	1.29E-03	1.04E-06	15.20	23.26	3.53
85	BT42	Barge Traffic	567831.8	4180344.7	4.79	1.29E-03	1.04E-06	15.20	23.26	3.53
86	BT43	Barge Traffic	567789.9	4180371.9	4.52	1.29E-03	1.04E-06	15.20	23.26	3.53
87	BT44	Barge Traffic	567747.9	4180399	6.26	1.29E-03	1.04E-06	15.20	23.26	3.53
88	BT45	Barge Traffic	567705.9	4180426.1	4.46	1.29E-03	1.04E-06	15.20	23.26	3.53
89	BT46	Barge Traffic	567663.9	4180453.3	4.29	1.29E-03	1.04E-06	15.20	23.26	3.53
90	BT47	Barge Traffic	567621.9	4180480.4	3.66	1.29E-03	1.04E-06	15.20	23.26	3.53
91	BT48	Barge Traffic	567579.9	4180507.6	2.83	1.29E-03	1.04E-06	15.20	23.26	3.53
92	BT49	Barge Traffic	567537.9	4180534.7	1.57	1.29E-03	1.04E-06	15.20	23.26	3.53
93	BT50	Barge Traffic	567495.9	4180561.9	1.45	1.29E-03	1.04E-06	15.20	23.26	3.53
94	BT51	Barge Traffic	567454	4180589	0.64	1.29E-03	1.04E-06	15.20	23.26	3.53
95	BT52	Barge Traffic	567412	4180616.2	0.63	1.29E-03	1.04E-06	15.20	23.26	3.53
96	BT53	Barge Traffic	567370	4180643.3	0.64	1.29E-03	1.04E-06	15.20	23.26	3.53
97	BT54	Barge Traffic	567328	4180670.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
98	BT55	Barge Traffic	567286	4180697.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
99	BT56	Barge Traffic	567244	4180724.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
100	BT57	Barge Traffic	567202	4180751.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
101	BT58	Barge Traffic	567160	4180779.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
102	BT59	Barge Traffic	567118	4180806.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
103	BT60	Barge Traffic	567076.1	4180833.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
104	BT61	Barge Traffic	567034.1	4180860.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
105	BT62	Barge Traffic	566992.1	4180887.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
106	BT63	Barge Traffic	566950.1	4180914.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
107	BT64	Barge Traffic	566908.1	4180942	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
108	BT65	Barge Traffic	566866.1	4180969.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
109	BT66	Barge Traffic	566824.1	4180996.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
110	BT67	Barge Traffic	566782.1	4181023.4	0.62	1.29E-03	1.04E-06	15.20	23.26	3.53
111	BT68	Barge Traffic	566740.2	4181050.6	1.35	1.29E-03	1.04E-06	15.20	23.26	3.53
112	BT69	Barge Traffic	566698.2	4181077.7	0.94	1.29E-03	1.04E-06	15.20	23.26	3.53
113	BT70	Barge Traffic	566656.2	4181104.9	0.92	1.29E-03	1.04E-06	15.20	23.26	3.53
114	BT71	Barge Traffic	566614.2	4181132	0.74	1.29E-03	1.04E-06	15.20	23.26	3.53
115	BT72	Barge Traffic	566572.2	4181159.1	0.62	1.29E-03	1.04E-06	15.20	23.26	3.53
116	BT73	Barge Traffic	566530.2	4181186.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
117	BT74	Barge Traffic	566488.2	4181213.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
118	BT75	Barge Traffic	566446.2	4181240.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
119	BT76	Barge Traffic	566404.3	4181267.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
120	BT77	Barge Traffic	566362.3	4181294.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
121	BT78	Barge Traffic	566320.3	4181322	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
122	BT79	Barge Traffic	566278.3	4181349.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
123	BT80	Barge Traffic	566236.3	4181376.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
124	BT81	Barge Traffic	566194.3	4181403.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
125	BT82	Barge Traffic	566152.3	4181430.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
126	BT83	Barge Traffic	566110.3	4181457.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
127	BT84	Barge Traffic	566068.4	4181484.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
128	BT85	Barge Traffic	566026.4	4181512.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
129	BT86	Barge Traffic	565984.4	4181539.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
130	BT87	Barge Traffic	565942.4	4181566.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
131	BT88	Barge Traffic	565900.4	4181593.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
132	BT89	Barge Traffic	565858.4	4181620.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
133	BT90	Barge Traffic	565816.4	4181647.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
134	BT91	Barge Traffic	565774.4	4181675	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
135	BT92	Barge Traffic	565732.4	4181702.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
136	BT93	Barge Traffic	565690.5	4181729.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
137	BT94	Barge Traffic	565648.5	4181756.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
138	BT95	Barge Traffic	565606.5	4181783.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
139	BT96	Barge Traffic	565564.5	4181810.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
140	BT97	Barge Traffic	565522.5	4181837.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
141	BT98	Barge Traffic	565480.5	4181865	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
142	BT99	Barge Traffic	565438.5	4181892.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
143	BT100	Barge Traffic	565396.5	4181919.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
144	BT101	Barge Traffic	565354.6	4181946.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
145	BT102	Barge Traffic	565312.6	4181973.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
146	BT103	Barge Traffic	565270.6	4182000.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
147	BT104	Barge Traffic	565228.6	4182027.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
148	BT105	Barge Traffic	565186.6	4182055	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
149	BT106	Barge Traffic	565144.6	4182082.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
150	BT107	Barge Traffic	565102.6	4182109.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
151	BT108	Barge Traffic	565060.6	4182136.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
152	BT109	Barge Traffic	565018.7	4182163.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
153	BT110	Barge Traffic	564976.7	4182190.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
154	BT111	Barge Traffic	564934.7	4182217.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
155	BT112	Barge Traffic	564892.7	4182245.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
156	BT113	Barge Traffic	564850.7	4182272.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
157	BT114	Barge Traffic	564808.7	4182299.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
158	BT115	Barge Traffic	564766.7	4182326.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
159	BT116	Barge Traffic	564724.7	4182353.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
160	BT117	Barge Traffic	564682.8	4182380.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
161	BT118	Barge Traffic	564640.8	4182408	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
162	BT119	Barge Traffic	564598.8	4182435.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
163	BT120	Barge Traffic	564556.8	4182462.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
164	BT121	Barge Traffic	564514.8	4182489.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
165	BT122	Barge Traffic	564472.8	4182516.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
166	BT123	Barge Traffic	564430.8	4182543.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
167	BT124	Barge Traffic	564388.8	4182570.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
168	BT125	Barge Traffic	564346.8	4182598	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
169	BT126	Barge Traffic	564304.9	4182625.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
170	BT127	Barge Traffic	564262.9	4182652.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
171	BT128	Barge Traffic	564220.9	4182679.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
172	BT129	Barge Traffic	564178.9	4182706.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
173	BT130	Barge Traffic	564135.6	4182731.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
174	BT131	Barge Traffic	564090.3	4182752.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
175	BT132	Barge Traffic	564045	4182773.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
176	BT133	Barge Traffic	563999.6	4182794.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
177	BT134	Barge Traffic	563954.3	4182815.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
178	BT135	Barge Traffic	563909	4182836.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
179	BT136	Barge Traffic	563863.6	4182857.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
180	BT137	Barge Traffic	563818.3	4182879	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
181	BT138	Barge Traffic	563772.9	4182900.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
182	BT139	Barge Traffic	563727.6	4182921.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
183	BT140	Barge Traffic	563682.3	4182942.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
184	BT141	Barge Traffic	563636.9	4182963.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
185	BT142	Barge Traffic	563591.6	4182984.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
186	BT143	Barge Traffic	563546.3	4183005.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
187	BT144	Barge Traffic	563500.9	4183026.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
188	BT145	Barge Traffic	563455.6	4183047.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
189	BT146	Barge Traffic	563407.7	4183053.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
190	BT147	Barge Traffic	563357.9	4183049.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
191	BT148	Barge Traffic	563308.2	4183044.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
192	BT149	Barge Traffic	563258.4	4183039.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
193	BT150	Barge Traffic	563208.6	4183034.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
194	BT151	Barge Traffic	563158.9	4183029.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
195	BT152	Barge Traffic	563109.1	4183025.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
196	BT153	Barge Traffic	563059.3	4183020.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
197	BT154	Barge Traffic	563009.6	4183015.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
198	BT155	Barge Traffic	562959.8	4183010.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
199	BT156	Barge Traffic	562910	4183005.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
200	BT157	Barge Traffic	562860.3	4183001.1	0.63	1.29E-03	1.04E-06	15.20	23.26	3.53
201	BT158	Barge Traffic	562810.5	4182996.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
202	BT159	Barge Traffic	562760.7	4182991.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
203	BT160	Barge Traffic	562711	4182986.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
204	BT161	Barge Traffic	562661.2	4182981.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
205	BT162	Barge Traffic	562611.4	4182977.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
206	BT163	Barge Traffic	562561.6	4182972.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
207	BT164	Barge Traffic	562511.9	4182967.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
208	BT165	Barge Traffic	562462.1	4182962.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
209	BT166	Barge Traffic	562412.3	4182957.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
210	BT167	Barge Traffic	562362.6	4182953	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
211	BT168	Barge Traffic	562312.8	4182948.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
212	BT169	Barge Traffic	562263	4182943.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
213	BT170	Barge Traffic	562213.3	4182938.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
214	BT171	Barge Traffic	562163.5	4182933.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
215	BT172	Barge Traffic	562113.7	4182929	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
216	BT173	Barge Traffic	562064	4182924.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
217	BT174	Barge Traffic	562014.2	4182919.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
218	BT175	Barge Traffic	561964.4	4182914.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
219	BT176	Barge Traffic	561914.7	4182909.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
220	BT177	Barge Traffic	561864.9	4182905	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
221	BT178	Barge Traffic	561815.1	4182900.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
222	BT179	Barge Traffic	561765.3	4182895.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
223	BT180	Barge Traffic	561715.6	4182890.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
224	BT181	Barge Traffic	561665.8	4182885.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
225	BT182	Barge Traffic	561616	4182881	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
226	BT183	Barge Traffic	561566.3	4182876.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
227	BT184	Barge Traffic	561517.1	4182878.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
228	BT185	Barge Traffic	561468.8	4182891.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
229	BT186	Barge Traffic	561420.5	4182904.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
230	BT187	Barge Traffic	561372.2	4182917.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
231	BT188	Barge Traffic	561323.9	4182930.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
232	BT189	Barge Traffic	561275.6	4182943	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
233	BT190	Barge Traffic	561227.3	4182955.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
234	BT191	Barge Traffic	561178.9	4182968.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
235	BT192	Barge Traffic	561130.6	4182981.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
236	BT193	Barge Traffic	561082.3	4182994.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
237	BT194	Barge Traffic	561034	4183007.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
238	BT195	Barge Traffic	560985.7	4183020.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
239	BT196	Barge Traffic	560937.4	4183033.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
240	BT197	Barge Traffic	560889.1	4183046.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
241	BT198	Barge Traffic	560840.8	4183059.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
242	BT199	Barge Traffic	560792.5	4183072	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
243	BT200	Barge Traffic	560744.2	4183084.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
244	BT201	Barge Traffic	560695.9	4183097.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
245	BT202	Barge Traffic	560647.6	4183110.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
246	BT203	Barge Traffic	560599.3	4183123.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
247	BT204	Barge Traffic	560551	4183136.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
248	BT205	Barge Traffic	560502.7	4183149.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
249	BT206	Barge Traffic	560454.3	4183162.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
250	BT207	Barge Traffic	560406	4183175.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
251	BT208	Barge Traffic	560357.7	4183188.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
252	BT209	Barge Traffic	560309.4	4183201.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
253	BT210	Barge Traffic	560261.1	4183214	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
254	BT211	Barge Traffic	560212.8	4183226.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
255	BT212	Barge Traffic	560164.5	4183239.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
256	BT213	Barge Traffic	560116.2	4183252.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
257	BT214	Barge Traffic	560067.9	4183265.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
258	BT215	Barge Traffic	560019.6	4183278.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
259	BT216	Barge Traffic	559971.3	4183291.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
260	BT217	Barge Traffic	559923	4183304.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
261	BT218	Barge Traffic	559874.7	4183317.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
262	BT219	Barge Traffic	559826.4	4183330.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
263	BT220	Barge Traffic	559778.1	4183343	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
264	BT221	Barge Traffic	559729.8	4183355.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
265	BT222	Barge Traffic	559681.4	4183368.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
266	BT223	Barge Traffic	559633.1	4183381.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
267	BT224	Barge Traffic	559584.8	4183394.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
268	BT225	Barge Traffic	559536.5	4183407.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
269	BT226	Barge Traffic	559488.2	4183420.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
270	BT227	Barge Traffic	559439.9	4183433.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
271	BT228	Barge Traffic	559391.6	4183446.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
272	BT229	Barge Traffic	559343.3	4183459.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
273	BT230	Barge Traffic	559295	4183472	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
274	BT231	Barge Traffic	559246.7	4183484.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
275	BT232	Barge Traffic	559198.4	4183497.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
276	BT233	Barge Traffic	559150.1	4183510.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
277	BT234	Barge Traffic	559101.8	4183523.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
278	BT235	Barge Traffic	559053.5	4183536.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
279	BT236	Barge Traffic	559005.2	4183549.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
280	BT237	Barge Traffic	558956.8	4183562.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
281	BT238	Barge Traffic	558908.5	4183575.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
282	BT239	Barge Traffic	558860.2	4183588.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
283	BT240	Barge Traffic	558812.9	4183604.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
284	BT241	Barge Traffic	558765.8	4183620.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
285	BT242	Barge Traffic	558718.6	4183637.5	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
286	BT243	Barge Traffic	558671.5	4183654.2	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
287	BT244	Barge Traffic	558624.3	4183670.8	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
288	BT245	Barge Traffic	558577.2	4183687.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
289	BT246	Barge Traffic	558530	4183704.1	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
290	BT247	Barge Traffic	558482.9	4183720.7	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
291	BT248	Barge Traffic	558435.7	4183737.4	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
292	BT249	Barge Traffic	558388.6	4183754	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
293	BT250	Barge Traffic	558341.4	4183770.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
294	BT251	Barge Traffic	558294.3	4183787.3	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
295	BT252	Barge Traffic	558247.1	4183803.9	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
296	BT253	Barge Traffic	558200	4183820.6	0.61	1.29E-03	1.04E-06	15.20	23.26	3.53
297	BT254	Barge Traffic	558152.8	4183837.2	0.6	1.29E-03	1.04E-06	15.20	23.26	3.53
298	BT255	Barge Traffic	558105.7	4183853.8	0.49	1.29E-03	1.04E-06	15.20	23.26	3.53
299	BT256	Barge Traffic	558058.5	4183870.5	0.23	1.29E-03	1.04E-06	15.20	23.26	3.53
300	BT257	Barge Traffic	558011.4	4183887.1	-0.38	1.29E-03	1.04E-06	15.20	23.26	3.53
301	BT258	Barge Traffic	557964.2	4183903.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
302	BT259	Barge Traffic	557917.1	4183920.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
303	BT260	Barge Traffic	557869.9	4183937	0	1.29E-03	1.04E-06	15.20	23.26	3.53
304	BT261	Barge Traffic	557822.8	4183953.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
305	BT262	Barge Traffic	557775.6	4183970.3	0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
306	BT263	Barge Traffic	557728.5	4183986.9	0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
307	BT264	Barge Traffic	557679	4183991.2	0.03	1.29E-03	1.04E-06	15.20	23.26	3.53
308	BT265	Barge Traffic	557629	4183992.8	0.04	1.29E-03	1.04E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
309	BT266	Barge Traffic	557579	4183994.4	0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
310	BT267	Barge Traffic	557529.1	4183996	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
311	BT268	Barge Traffic	557479.1	4183997.6	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
312	BT269	Barge Traffic	557429.1	4183999.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
313	BT270	Barge Traffic	557379.1	4184000.7	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
314	BT271	Barge Traffic	557329.2	4184002.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
315	BT272	Barge Traffic	557279.2	4184003.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
316	BT273	Barge Traffic	557229.2	4184005.5	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
317	BT274	Barge Traffic	557179.2	4184007.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
318	BT275	Barge Traffic	557129.3	4184008.7	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
319	BT276	Barge Traffic	557079.3	4184010.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
320	BT277	Barge Traffic	557029.3	4184011.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
321	BT278	Barge Traffic	556979.3	4184013.4	0.03	1.29E-03	1.04E-06	15.20	23.26	3.53
322	BT279	Barge Traffic	556929.4	4184015	0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
323	BT280	Barge Traffic	556879.4	4184016.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
324	BT281	Barge Traffic	556829.4	4184018.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
325	BT282	Barge Traffic	556779.4	4184019.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
326	BT283	Barge Traffic	556729.5	4184021.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
327	BT284	Barge Traffic	556679.5	4184023	0	1.29E-03	1.04E-06	15.20	23.26	3.53
328	BT285	Barge Traffic	556629.5	4184024.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
329	BT286	Barge Traffic	556579.5	4184026.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
330	BT287	Barge Traffic	556529.6	4184027.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
331	BT288	Barge Traffic	556479.6	4184029.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
332	BT289	Barge Traffic	556429.6	4184030.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
333	BT290	Barge Traffic	556379.6	4184032.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
334	BT291	Barge Traffic	556329.7	4184034.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
335	BT292	Barge Traffic	556279.7	4184035.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
336	BT293	Barge Traffic	556229.7	4184037.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
337	BT294	Barge Traffic	556179.7	4184038.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
338	BT295	Barge Traffic	556129.8	4184040.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
339	BT296	Barge Traffic	556079.8	4184042	0	1.29E-03	1.04E-06	15.20	23.26	3.53
340	BT297	Barge Traffic	556029.8	4184043.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
341	BT298	Barge Traffic	555979.8	4184045.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
342	BT299	Barge Traffic	555929.9	4184046.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
343	BT300	Barge Traffic	555879.9	4184048.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
344	BT301	Barge Traffic	555829.9	4184049.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
345	BT302	Barge Traffic	555779.9	4184051.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
346	BT303	Barge Traffic	555730	4184053.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
347	BT304	Barge Traffic	555680	4184054.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
348	BT305	Barge Traffic	555630	4184056.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
349	BT306	Barge Traffic	555589	4184081.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
350	BT307	Barge Traffic	555550.1	4184113.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
351	BT308	Barge Traffic	555511.2	4184144.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
352	BT309	Barge Traffic	555472.3	4184176.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
353	BT310	Barge Traffic	555433.4	4184207.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
354	BT311	Barge Traffic	555394.5	4184239.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
355	BT312	Barge Traffic	555355.7	4184270.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
356	BT313	Barge Traffic	555316.8	4184301.9	0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
357	BT314	Barge Traffic	555277.9	4184333.3	0.03	1.29E-03	1.04E-06	15.20	23.26	3.53
358	BT315	Barge Traffic	555239	4184364.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
359	BT316	Barge Traffic	555200.1	4184396.2	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
360	BT317	Barge Traffic	555161.2	4184427.6	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
361	BT318	Barge Traffic	555122.3	4184459.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
362	BT319	Barge Traffic	555083.4	4184490.5	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
363	BT320	Barge Traffic	555044.6	4184521.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
364	BT321	Barge Traffic	555005.7	4184553.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
365	BT322	Barge Traffic	554966.8	4184584.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
366	BT323	Barge Traffic	554927.9	4184616.2	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
367	BT324	Barge Traffic	554889	4184647.6	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
368	BT325	Barge Traffic	554850.1	4184679.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
369	BT326	Barge Traffic	554811.2	4184710.5	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
370	BT327	Barge Traffic	554772.3	4184741.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
371	BT328	Barge Traffic	554733.5	4184773.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
372	BT329	Barge Traffic	554694.6	4184804.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
373	BT330	Barge Traffic	554655.7	4184836.2	0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
374	BT331	Barge Traffic	554616.8	4184867.6	0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
375	BT332	Barge Traffic	554577.9	4184899.1	0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
376	BT333	Barge Traffic	554539	4184930.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
377	BT334	Barge Traffic	554500.1	4184961.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
378	BT335	Barge Traffic	554461.2	4184993.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
379	BT336	Barge Traffic	554422.4	4185024.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
380	BT337	Barge Traffic	554383.5	4185056.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
381	BT338	Barge Traffic	554344.6	4185087.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
382	BT339	Barge Traffic	554305.7	4185119.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
383	BT340	Barge Traffic	554266.8	4185150.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
384	BT341	Barge Traffic	554227.9	4185181.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
385	BT342	Barge Traffic	554189	4185213.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
386	BT343	Barge Traffic	554150.1	4185244.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
387	BT344	Barge Traffic	554111.3	4185276.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
388	BT345	Barge Traffic	554072.4	4185307.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
389	BT346	Barge Traffic	554033.5	4185339.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
390	BT347	Barge Traffic	553994.6	4185370.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
391	BT348	Barge Traffic	553955.7	4185401.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
392	BT349	Barge Traffic	553916.8	4185433.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
393	BT350	Barge Traffic	553877.9	4185464.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
394	BT351	Barge Traffic	553839	4185496.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
395	BT352	Barge Traffic	553800.2	4185527.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
396	BT353	Barge Traffic	553761.3	4185559.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
397	BT354	Barge Traffic	553722.4	4185590.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
398	BT355	Barge Traffic	553683.5	4185621.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
399	BT356	Barge Traffic	553644.6	4185653.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
400	BT357	Barge Traffic	553605.7	4185684.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
401	BT358	Barge Traffic	553566.8	4185716.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
402	BT359	Barge Traffic	553527.9	4185747.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
403	BT360	Barge Traffic	553489.1	4185779.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
404	BT361	Barge Traffic	553450.2	4185810.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
405	BT362	Barge Traffic	553411.3	4185841.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
406	BT363	Barge Traffic	553372.4	4185873.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
407	BT364	Barge Traffic	553333.5	4185904.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
408	BT365	Barge Traffic	553294.6	4185936.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
409	BT366	Barge Traffic	553255.7	4185967.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
410	BT367	Barge Traffic	553216.8	4185999.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
411	BT368	Barge Traffic	553178	4186030.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
412	BT369	Barge Traffic	553139.1	4186061.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
413	BT370	Barge Traffic	553100.2	4186093.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
414	BT371	Barge Traffic	553061.3	4186124.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
415	BT372	Barge Traffic	553022.4	4186156.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
416	BT373	Barge Traffic	552983.5	4186187.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
417	BT374	Barge Traffic	552944.6	4186219.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
418	BT375	Barge Traffic	552905.7	4186250.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
419	BT376	Barge Traffic	552866.9	4186281.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
420	BT377	Barge Traffic	552828	4186313.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
421	BT378	Barge Traffic	552789.1	4186344.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
422	BT379	Barge Traffic	552750.2	4186376.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
423	BT380	Barge Traffic	552711.3	4186407.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
424	BT381	Barge Traffic	552672.4	4186439.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
425	BT382	Barge Traffic	552633.5	4186470.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
426	BT383	Barge Traffic	552594.6	4186501.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
427	BT384	Barge Traffic	552555.8	4186533.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
428	BT385	Barge Traffic	552516.9	4186564.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
429	BT386	Barge Traffic	552478	4186596.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
430	BT387	Barge Traffic	552439.1	4186627.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
431	BT388	Barge Traffic	552400.2	4186659.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
432	BT389	Barge Traffic	552361.3	4186690.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
433	BT390	Barge Traffic	552322.4	4186721.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
434	BT391	Barge Traffic	552283.5	4186753.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
435	BT392	Barge Traffic	552244.7	4186784.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
436	BT393	Barge Traffic	552205.8	4186816.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
437	BT394	Barge Traffic	552166.9	4186847.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
438	BT395	Barge Traffic	552128	4186879.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
439	BT396	Barge Traffic	552089.1	4186910.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
440	BT397	Barge Traffic	552050.2	4186941.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
441	BT398	Barge Traffic	552011.3	4186973.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
442	BT399	Barge Traffic	551972.4	4187004.8	-0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
443	BT400	Barge Traffic	551933.6	4187036.2	-0.08	1.29E-03	1.04E-06	15.20	23.26	3.53
444	BT401	Barge Traffic	551894.7	4187067.6	-0.17	1.29E-03	1.04E-06	15.20	23.26	3.53
445	BT402	Barge Traffic	551855.8	4187099.1	-0.24	1.29E-03	1.04E-06	15.20	23.26	3.53
446	BT403	Barge Traffic	551816.9	4187130.5	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
447	BT404	Barge Traffic	551778	4187161.9	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
448	BT405	Barge Traffic	551739.1	4187193.4	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
449	BT406	Barge Traffic	551700.2	4187224.8	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
450	BT407	Barge Traffic	551661.3	4187256.2	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
451	BT408	Barge Traffic	551622.5	4187287.6	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
452	BT409	Barge Traffic	551583.6	4187319.1	-0.25	1.29E-03	1.04E-06	15.20	23.26	3.53
453	BT410	Barge Traffic	551544.7	4187350.5	-0.18	1.29E-03	1.04E-06	15.20	23.26	3.53
454	BT411	Barge Traffic	551505.8	4187381.9	-0.08	1.29E-03	1.04E-06	15.20	23.26	3.53
455	BT412	Barge Traffic	551466.9	4187413.4	-0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
456	BT413	Barge Traffic	551428	4187444.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
457	BT414	Barge Traffic	551389.1	4187476.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
458	BT415	Barge Traffic	551350.2	4187507.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
459	BT416	Barge Traffic	551311.4	4187539.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
460	BT417	Barge Traffic	551272.5	4187570.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
461	BT418	Barge Traffic	551233.6	4187601.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
462	BT419	Barge Traffic	551194.7	4187633.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
463	BT420	Barge Traffic	551155.8	4187664.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
464	BT421	Barge Traffic	551116.9	4187696.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
465	BT422	Barge Traffic	551078	4187727.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
466	BT423	Barge Traffic	551039.1	4187759.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
467	BT424	Barge Traffic	551000.3	4187790.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
468	BT425	Barge Traffic	550961.4	4187821.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
469	BT426	Barge Traffic	550922.5	4187853.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
470	BT427	Barge Traffic	550883.6	4187884.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
471	BT428	Barge Traffic	550844.7	4187916.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
472	BT429	Barge Traffic	550805.8	4187947.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
473	BT430	Barge Traffic	550766.9	4187979.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
474	BT431	Barge Traffic	550724.8	4188005.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
475	BT432	Barge Traffic	550681.1	4188030	0	1.29E-03	1.04E-06	15.20	23.26	3.53
476	BT433	Barge Traffic	550637.4	4188054.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
477	BT434	Barge Traffic	550593.7	4188078.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
478	BT435	Barge Traffic	550550	4188102.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
479	BT436	Barge Traffic	550506.3	4188127.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
480	BT437	Barge Traffic	550462.6	4188151.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
481	BT438	Barge Traffic	550418.9	4188175.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
482	BT439	Barge Traffic	550375.2	4188200	0	1.29E-03	1.04E-06	15.20	23.26	3.53
483	BT440	Barge Traffic	550331.5	4188224.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
484	BT441	Barge Traffic	550287.8	4188248.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
485	BT442	Barge Traffic	550244.1	4188272.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
486	BT443	Barge Traffic	550200.3	4188297.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
487	BT444	Barge Traffic	550156.6	4188321.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
488	BT445	Barge Traffic	550112.9	4188345.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
489	BT446	Barge Traffic	550069.2	4188370	0	1.29E-03	1.04E-06	15.20	23.26	3.53
490	BT447	Barge Traffic	550025.5	4188394.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
491	BT448	Barge Traffic	549981.8	4188418.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
492	BT449	Barge Traffic	549938.1	4188442.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
493	BT450	Barge Traffic	549894.4	4188467.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
494	BT451	Barge Traffic	549850.7	4188491.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
495	BT452	Barge Traffic	549807	4188515.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
496	BT453	Barge Traffic	549763.3	4188540	0	1.29E-03	1.04E-06	15.20	23.26	3.53
497	BT454	Barge Traffic	549719.6	4188564.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
498	BT455	Barge Traffic	549672.3	4188567.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
499	BT456	Barge Traffic	549623.1	4188558.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
500	BT457	Barge Traffic	549573.9	4188549.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
501	BT458	Barge Traffic	549524.7	4188540.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
502	BT459	Barge Traffic	549475.5	4188531.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
503	BT460	Barge Traffic	549426.3	4188522.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
504	BT461	Barge Traffic	549377.1	4188513.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
505	BT462	Barge Traffic	549327.9	4188505	0	1.29E-03	1.04E-06	15.20	23.26	3.53
506	BT463	Barge Traffic	549278.7	4188496.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
507	BT464	Barge Traffic	549229.5	4188487.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
508	BT465	Barge Traffic	549180.3	4188478.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
509	BT466	Barge Traffic	549131.1	4188469.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
510	BT467	Barge Traffic	549081.9	4188460.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
511	BT468	Barge Traffic	549032.7	4188451.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
512	BT469	Barge Traffic	548983.5	4188442.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
513	BT470	Barge Traffic	548934.2	4188433.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
514	BT471	Barge Traffic	548885	4188425.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
515	BT472	Barge Traffic	548835.8	4188416.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
516	BT473	Barge Traffic	548786.6	4188407.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
517	BT474	Barge Traffic	548737.4	4188398.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
518	BT475	Barge Traffic	548688.2	4188389.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
519	BT476	Barge Traffic	548639	4188380.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
520	BT477	Barge Traffic	548589.8	4188371.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
521	BT478	Barge Traffic	548540.6	4188362.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
522	BT479	Barge Traffic	548492.4	4188350.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
523	BT480	Barge Traffic	548446.9	4188330	0	1.29E-03	1.04E-06	15.20	23.26	3.53
524	BT481	Barge Traffic	548401.5	4188309.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
525	BT482	Barge Traffic	548356.1	4188288.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
526	BT483	Barge Traffic	548310.6	4188267.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
527	BT484	Barge Traffic	548265.2	4188246.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
528	BT485	Barge Traffic	548219.8	4188225.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
529	BT486	Barge Traffic	548174.3	4188204.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
530	BT487	Barge Traffic	548128.9	4188183.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
531	BT488	Barge Traffic	548083.5	4188163	0	1.29E-03	1.04E-06	15.20	23.26	3.53
532	BT489	Barge Traffic	548038	4188142.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
533	BT490	Barge Traffic	547992.6	4188121.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
534	BT491	Barge Traffic	547947.2	4188100.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
535	BT492	Barge Traffic	547901.7	4188079.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
536	BT493	Barge Traffic	547921.1	4188080	0	1.29E-03	1.04E-06	15.20	23.26	3.53
537	BT494	Barge Traffic	547970.1	4188090.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
538	BT495	Barge Traffic	548019	4188100.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
539	BT496	Barge Traffic	548068	4188110.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53

Baseline Volume Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
540	BT497	Barge Traffic	548116.9	4188120.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
541	BT498	Barge Traffic	548165.9	4188130.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
542	BT499	Barge Traffic	548214.8	4188141	0	1.29E-03	1.04E-06	15.20	23.26	3.53
543	BT500	Barge Traffic	548263.8	4188151.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
544	BT501	Barge Traffic	548312.7	4188161.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
545	BT502	Barge Traffic	548361.7	4188171.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
546	BT503	Barge Traffic	548410.6	4188181.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
547	BT504	Barge Traffic	548459.6	4188191.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
548	BT505	Barge Traffic	548508.6	4188202.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
549	BT506	Barge Traffic	548557.5	4188212.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
550	BT507	Barge Traffic	548606.5	4188222.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
551	BT508	Barge Traffic	548655.4	4188232.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
552	BT509	Barge Traffic	548704.4	4188242.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
553	BT510	Barge Traffic	548753.3	4188253	0	1.29E-03	1.04E-06	15.20	23.26	3.53
554	BT511	Barge Traffic	548802.3	4188263.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
555	BT512	Barge Traffic	548851.2	4188273.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
556	BT513	Barge Traffic	548900.2	4188283.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
557	BT514	Barge Traffic	548949.1	4188293.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
558	BT515	Barge Traffic	548998.1	4188303.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
559	BT516	Barge Traffic	549047	4188314	0	1.29E-03	1.04E-06	15.20	23.26	3.53
560	BT517	Barge Traffic	549096	4188324.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
561	BT518	Barge Traffic	549145	4188334.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
562	BT519	Barge Traffic	549193.9	4188344.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
563	BT520	Barge Traffic	549242.9	4188354.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
564	BT521	Barge Traffic	549291.8	4188364.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
565	BT522	Barge Traffic	549340.8	4188375.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
566	BT523	Barge Traffic	549389.7	4188385.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
567	BT524	Barge Traffic	549438.7	4188395.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
568	BT525	Barge Traffic	549487.6	4188405.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
569	BT526	Barge Traffic	549536.6	4188415.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
570	BT527	Barge Traffic	549583.6	4188415	0	1.29E-03	1.04E-06	15.20	23.26	3.53
571	BT528	Barge Traffic	549626.3	4188389	0	1.29E-03	1.04E-06	15.20	23.26	3.53
572	BT529	Barge Traffic	549669	4188363	0	1.29E-03	1.04E-06	15.20	23.26	3.53
573	BT530	Barge Traffic	549711.7	4188337	0	1.29E-03	1.04E-06	15.20	23.26	3.53
574	BT531	Barge Traffic	549754.4	4188311	0	1.29E-03	1.04E-06	15.20	23.26	3.53
575	BT532	Barge Traffic	549797.1	4188285	0	1.29E-03	1.04E-06	15.20	23.26	3.53
576	BT533	Barge Traffic	549839.8	4188259	0	1.29E-03	1.04E-06	15.20	23.26	3.53
577	BT534	Barge Traffic	549882.5	4188232.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
578	BT535	Barge Traffic	549925.2	4188206.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
579	BT536	Barge Traffic	549968	4188180.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
580	BT537	Barge Traffic	550010.7	4188154.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
581	BT538	Barge Traffic	550053.4	4188128.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
582	BT539	Barge Traffic	550096.1	4188102.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
583	BT540	Barge Traffic	550138.8	4188076.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
584	BT541	Barge Traffic	550181.5	4188050.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
585	BT542	Barge Traffic	550224.2	4188024.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
586	BT543	Barge Traffic	550266.9	4187998.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
587	BT544	Barge Traffic	550309.6	4187972.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
588	BT545	Barge Traffic	550352.3	4187946.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
589	BT546	Barge Traffic	550395	4187920.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
590	BT547	Barge Traffic	550437.7	4187894.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
591	BT548	Barge Traffic	550480.4	4187868.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
592	BT549	Barge Traffic	550523.1	4187842.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
593	BT550	Barge Traffic	550565.8	4187816.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
594	BT551	Barge Traffic	550608.5	4187790.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
595	BT552	Barge Traffic	550651.2	4187764.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
596	BT553	Barge Traffic	550693.9	4187738.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
597	BT554	Barge Traffic	550736.6	4187712.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
598	BT555	Barge Traffic	550779.3	4187686.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
599	BT556	Barge Traffic	550822	4187660.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
600	BT557	Barge Traffic	550864.7	4187634.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
601	BT558	Barge Traffic	550907.4	4187608.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
602	BT559	Barge Traffic	550950.1	4187582.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
603	BT560	Barge Traffic	550992.8	4187556.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
604	BT561	Barge Traffic	551032.4	4187526.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
605	BT562	Barge Traffic	551066.2	4187490	0	1.29E-03	1.04E-06	15.20	23.26	3.53
606	BT563	Barge Traffic	551099.9	4187453.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
607	BT564	Barge Traffic	551133.7	4187416.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
608	BT565	Barge Traffic	551167.5	4187379.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
609	BT566	Barge Traffic	551201.3	4187342.6	-0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
610	BT567	Barge Traffic	551235.1	4187305.7	-0.07	1.29E-03	1.04E-06	15.20	23.26	3.53
611	BT568	Barge Traffic	551268.9	4187268.8	-0.18	1.29E-03	1.04E-06	15.20	23.26	3.53
612	BT569	Barge Traffic	551302.7	4187232	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
613	BT570	Barge Traffic	551336.4	4187195.1	-0.29	1.29E-03	1.04E-06	15.20	23.26	3.53
614	BT571	Barge Traffic	551370.2	4187158.3	-0.29	1.29E-03	1.04E-06	15.20	23.26	3.53
615	BT572	Barge Traffic	551404	4187121.4	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53
616	BT573	Barge Traffic	551437.8	4187084.5	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
617	BT574	Barge Traffic	551471.6	4187047.7	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53
618	BT575	Barge Traffic	551505.4	4187010.8	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53
619	BT576	Barge Traffic	551539.2	4186974	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53
620	BT577	Barge Traffic	551572.9	4186937.1	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53
621	BT578	Barge Traffic	551606.7	4186900.3	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
622	BT579	Barge Traffic	551640.5	4186863.4	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
623	BT580	Barge Traffic	551674.3	4186826.5	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
624	BT581	Barge Traffic	551708.1	4186789.7	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
625	BT582	Barge Traffic	551741.9	4186752.8	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
626	BT583	Barge Traffic	551771.9	4186713	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
627	BT584	Barge Traffic	551799.9	4186671.6	-0.27	1.29E-03	1.04E-06	15.20	23.26	3.53
628	BT585	Barge Traffic	551827.8	4186630.1	-0.26	1.29E-03	1.04E-06	15.20	23.26	3.53
629	BT586	Barge Traffic	551855.8	4186588.7	-0.26	1.29E-03	1.04E-06	15.20	23.26	3.53
630	BT587	Barge Traffic	551883.8	4186547.2	-0.26	1.29E-03	1.04E-06	15.20	23.26	3.53
631	BT588	Barge Traffic	551911.7	4186505.8	-0.24	1.29E-03	1.04E-06	15.20	23.26	3.53
632	BT589	Barge Traffic	551939.7	4186464.3	-0.16	1.29E-03	1.04E-06	15.20	23.26	3.53
633	BT590	Barge Traffic	551967.6	4186422.9	-0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
634	BT591	Barge Traffic	551995.6	4186381.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
635	BT592	Barge Traffic	552023.6	4186340	0	1.29E-03	1.04E-06	15.20	23.26	3.53
636	BT593	Barge Traffic	552051.5	4186298.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
637	BT594	Barge Traffic	552079.5	4186257.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
638	BT595	Barge Traffic	552107.5	4186215.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
639	BT596	Barge Traffic	552135.4	4186174.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
640	BT597	Barge Traffic	552163.4	4186132.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
641	BT598	Barge Traffic	552191.3	4186091.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
642	BT599	Barge Traffic	552219.3	4186049.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
643	BT600	Barge Traffic	552247.3	4186008.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
644	BT601	Barge Traffic	552275.2	4185966.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
645	BT602	Barge Traffic	552303.2	4185925.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
646	BT603	Barge Traffic	552331.1	4185884	0	1.29E-03	1.04E-06	15.20	23.26	3.53
647	BT604	Barge Traffic	552359.1	4185842.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
648	BT605	Barge Traffic	552387.1	4185801.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
649	BT606	Barge Traffic	552415	4185759.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
650	BT607	Barge Traffic	552443	4185718.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
651	BT608	Barge Traffic	552471	4185676.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
652	BT609	Barge Traffic	552498.9	4185635.3	-0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
653	BT610	Barge Traffic	552526.9	4185593.9	-0.08	1.29E-03	1.04E-06	15.20	23.26	3.53
654	BT611	Barge Traffic	552554.8	4185552.4	-0.15	1.29E-03	1.04E-06	15.20	23.26	3.53
655	BT612	Barge Traffic	552582.8	4185511	-0.17	1.29E-03	1.04E-06	15.20	23.26	3.53
656	BT613	Barge Traffic	552610.8	4185469.5	-0.17	1.29E-03	1.04E-06	15.20	23.26	3.53
657	BT614	Barge Traffic	552638.7	4185428.1	-0.17	1.29E-03	1.04E-06	15.20	23.26	3.53
658	BT615	Barge Traffic	552666.7	4185386.6	-0.16	1.29E-03	1.04E-06	15.20	23.26	3.53
659	BT616	Barge Traffic	552694.7	4185345.2	-0.16	1.29E-03	1.04E-06	15.20	23.26	3.53
660	BT617	Barge Traffic	552722.6	4185303.7	-0.16	1.29E-03	1.04E-06	15.20	23.26	3.53
661	BT618	Barge Traffic	552750.6	4185262.3	-0.12	1.29E-03	1.04E-06	15.20	23.26	3.53
662	BT619	Barge Traffic	552778.5	4185220.8	-0.09	1.29E-03	1.04E-06	15.20	23.26	3.53
663	BT620	Barge Traffic	552806.5	4185179.4	-0.07	1.29E-03	1.04E-06	15.20	23.26	3.53
664	BT621	Barge Traffic	552834.5	4185137.9	-0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
665	BT622	Barge Traffic	552862.4	4185096.5	-0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
666	BT623	Barge Traffic	552890.4	4185055	-0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
667	BT624	Barge Traffic	552918.4	4185013.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
668	BT625	Barge Traffic	552946.3	4184972.1	0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
669	BT626	Barge Traffic	552974.3	4184930.6	0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
670	BT627	Barge Traffic	553002.2	4184889.2	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
671	BT628	Barge Traffic	553030.2	4184847.7	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
672	BT629	Barge Traffic	553058.2	4184806.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
673	BT630	Barge Traffic	553086.1	4184764.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
674	BT631	Barge Traffic	553114.1	4184723.4	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
675	BT632	Barge Traffic	553142.1	4184681.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
676	BT633	Barge Traffic	553170	4184640.5	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
677	BT634	Barge Traffic	553198	4184599	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
678	BT635	Barge Traffic	553225.9	4184557.6	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
679	BT636	Barge Traffic	553253.9	4184516.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
680	BT637	Barge Traffic	553281.9	4184474.7	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
681	BT638	Barge Traffic	553309.8	4184433.2	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
682	BT639	Barge Traffic	553337.8	4184391.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
683	BT640	Barge Traffic	553365.7	4184350.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
684	BT641	Barge Traffic	553393.7	4184308.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
685	BT642	Barge Traffic	553421.7	4184267.4	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
686	BT643	Barge Traffic	553449.6	4184226	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
687	BT644	Barge Traffic	553477.6	4184184.5	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
688	BT645	Barge Traffic	553505.6	4184143.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
689	BT646	Barge Traffic	553533.5	4184101.6	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
690	BT647	Barge Traffic	553561.5	4184060.2	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
691	BT648	Barge Traffic	553589.4	4184018.7	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
692	BT649	Barge Traffic	553617.4	4183977.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
693	BT650	Barge Traffic	553645.4	4183935.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53

Baseline Volume Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
694	BT651	Barge Traffic	553673.3	4183894.4	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
695	BT652	Barge Traffic	553701.3	4183852.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
696	BT653	Barge Traffic	553729.3	4183811.5	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
697	BT654	Barge Traffic	553757.2	4183770	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
698	BT655	Barge Traffic	553785.2	4183728.6	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
699	BT656	Barge Traffic	553813.1	4183687.1	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
700	BT657	Barge Traffic	553841.1	4183645.7	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
701	BT658	Barge Traffic	553869.1	4183604.2	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
702	BT659	Barge Traffic	553897	4183562.8	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
703	BT660	Barge Traffic	553925	4183521.3	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
704	BT661	Barge Traffic	553953	4183479.9	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
705	BT662	Barge Traffic	553980.9	4183438.4	0.05	1.29E-03	1.04E-06	15.20	23.26	3.53
706	BT663	Barge Traffic	554008.9	4183397	0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
707	BT664	Barge Traffic	554036.8	4183355.5	0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
708	BT665	Barge Traffic	554064.8	4183314.1	0.03	1.29E-03	1.04E-06	15.20	23.26	3.53
709	BT666	Barge Traffic	554092.8	4183272.6	0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
710	BT667	Barge Traffic	554120.7	4183231.2	0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
711	BT668	Barge Traffic	554148.7	4183189.7	0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
712	BT669	Barge Traffic	554176.7	4183148.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
713	BT670	Barge Traffic	554204.6	4183106.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
714	BT671	Barge Traffic	554232.6	4183065.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
715	BT672	Barge Traffic	554260.5	4183023.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
716	BT673	Barge Traffic	554288.5	4182982.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
717	BT674	Barge Traffic	554316.5	4182941	0	1.29E-03	1.04E-06	15.20	23.26	3.53
718	BT675	Barge Traffic	554344.4	4182899.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
719	BT676	Barge Traffic	554372.4	4182858.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
720	BT677	Barge Traffic	554400.3	4182816.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
721	BT678	Barge Traffic	554428.3	4182775.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
722	BT679	Barge Traffic	554456.3	4182733.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
723	BT680	Barge Traffic	554484.2	4182692.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
724	BT681	Barge Traffic	554512.2	4182650.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
725	BT682	Barge Traffic	554540.2	4182609.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
726	BT683	Barge Traffic	554568.1	4182568	0	1.29E-03	1.04E-06	15.20	23.26	3.53
727	BT684	Barge Traffic	554589	4182523.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
728	BT685	Barge Traffic	554595	4182474.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
729	BT686	Barge Traffic	554601	4182424.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
730	BT687	Barge Traffic	554607.1	4182375	0	1.29E-03	1.04E-06	15.20	23.26	3.53
731	BT688	Barge Traffic	554613.1	4182325.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
732	BT689	Barge Traffic	554619.2	4182275.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
733	BT690	Barge Traffic	554625.2	4182226.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
734	BT691	Barge Traffic	554631.2	4182176.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
735	BT692	Barge Traffic	554637.3	4182126.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
736	BT693	Barge Traffic	554643.3	4182077.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
737	BT694	Barge Traffic	554649.4	4182027.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
738	BT695	Barge Traffic	554655.4	4181977.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
739	BT696	Barge Traffic	554661.4	4181928.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
740	BT697	Barge Traffic	554667.5	4181878.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
741	BT698	Barge Traffic	554673.5	4181829	0	1.29E-03	1.04E-06	15.20	23.26	3.53
742	BT699	Barge Traffic	554679.5	4181779.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
743	BT700	Barge Traffic	554685.6	4181729.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
744	BT701	Barge Traffic	554691.6	4181680.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
745	BT702	Barge Traffic	554697.7	4181630.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
746	BT703	Barge Traffic	554703.7	4181580.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
747	BT704	Barge Traffic	554709.7	4181531.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
748	BT705	Barge Traffic	554715.8	4181481.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
749	BT706	Barge Traffic	554721.8	4181431.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
750	BT707	Barge Traffic	554727.9	4181382.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
751	BT708	Barge Traffic	554733.9	4181332.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
752	BT709	Barge Traffic	554739.9	4181283	0	1.29E-03	1.04E-06	15.20	23.26	3.53
753	BT710	Barge Traffic	554746	4181233.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
754	BT711	Barge Traffic	554752	4181183.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
755	BT712	Barge Traffic	554758.1	4181134.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
756	BT713	Barge Traffic	554764.1	4181084.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
757	BT714	Barge Traffic	554770.1	4181034.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
758	BT715	Barge Traffic	554776.2	4180985.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
759	BT716	Barge Traffic	554782.2	4180935.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
760	BT717	Barge Traffic	554788.3	4180886	0	1.29E-03	1.04E-06	15.20	23.26	3.53
761	BT718	Barge Traffic	554794.3	4180836.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
762	BT719	Barge Traffic	554800.3	4180786.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
763	BT720	Barge Traffic	554806.4	4180737.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
764	BT721	Barge Traffic	554812.4	4180687.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
765	BT722	Barge Traffic	554818.5	4180637.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
766	BT723	Barge Traffic	554824.5	4180588.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
767	BT724	Barge Traffic	554830.5	4180538.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
768	BT725	Barge Traffic	554836.6	4180488.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
769	BT726	Barge Traffic	554842.6	4180439.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
770	BT727	Barge Traffic	554848.6	4180389.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
771	BT728	Barge Traffic	554854.7	4180340	0	1.29E-03	1.04E-06	15.20	23.26	3.53
772	BT729	Barge Traffic	554860.7	4180290.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
773	BT730	Barge Traffic	554866.8	4180240.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
774	BT731	Barge Traffic	554872.8	4180191.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
775	BT732	Barge Traffic	554878.8	4180141.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
776	BT733	Barge Traffic	554884.9	4180091.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
777	BT734	Barge Traffic	554890.9	4180042.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
778	BT735	Barge Traffic	554897	4179992.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
779	BT736	Barge Traffic	554903	4179942.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
780	BT737	Barge Traffic	554909	4179893.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
781	BT738	Barge Traffic	554915.1	4179843.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
782	BT739	Barge Traffic	554921.1	4179794	0	1.29E-03	1.04E-06	15.20	23.26	3.53
783	BT740	Barge Traffic	554927.2	4179744.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
784	BT741	Barge Traffic	554933.2	4179694.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
785	BT742	Barge Traffic	554939.2	4179645.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
786	BT743	Barge Traffic	554945.3	4179595.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
787	BT744	Barge Traffic	554951.3	4179545.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
788	BT745	Barge Traffic	554957.4	4179496.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
789	BT746	Barge Traffic	554963.4	4179446.6	-0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
790	BT747	Barge Traffic	554969.4	4179396.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
791	BT748	Barge Traffic	554975.5	4179347.3	-0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
792	BT749	Barge Traffic	554981.5	4179297.7	-0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
793	BT750	Barge Traffic	554987.5	4179248	-0.04	1.29E-03	1.04E-06	15.20	23.26	3.53
794	BT751	Barge Traffic	554993.6	4179198.4	-0.03	1.29E-03	1.04E-06	15.20	23.26	3.53
795	BT752	Barge Traffic	554999.6	4179148.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
796	BT753	Barge Traffic	555005.7	4179099.1	0	1.29E-03	1.04E-06	15.20	23.26	3.53
797	BT754	Barge Traffic	555011.7	4179049.5	-0.17	1.29E-03	1.04E-06	15.20	23.26	3.53
798	BT755	Barge Traffic	555017.7	4178999.9	-0.28	1.29E-03	1.04E-06	15.20	23.26	3.53
799	BT756	Barge Traffic	555023.8	4178950.2	-0.03	1.29E-03	1.04E-06	15.20	23.26	3.53
800	BT757	Barge Traffic	555029.8	4178900.6	0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
801	BT758	Barge Traffic	555035.9	4178851	0.07	1.29E-03	1.04E-06	15.20	23.26	3.53
802	BT759	Barge Traffic	555041.9	4178801.3	0	1.29E-03	1.04E-06	15.20	23.26	3.53
803	BT760	Barge Traffic	555047.9	4178751.7	-0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
804	BT761	Barge Traffic	555054	4178702.1	-0.02	1.29E-03	1.04E-06	15.20	23.26	3.53
805	BT762	Barge Traffic	555060	4178652.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
806	BT763	Barge Traffic	555066.1	4178602.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
807	BT764	Barge Traffic	555072.1	4178553.2	0	1.29E-03	1.04E-06	15.20	23.26	3.53
808	BT765	Barge Traffic	555078.1	4178503.5	0	1.29E-03	1.04E-06	15.20	23.26	3.53
809	BT766	Barge Traffic	555084.2	4178453.9	0	1.29E-03	1.04E-06	15.20	23.26	3.53
810	BT767	Barge Traffic	555090.2	4178404.3	-0.01	1.29E-03	1.04E-06	15.20	23.26	3.53
811	BT768	Barge Traffic	555096.3	4178354.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
812	BT769	Barge Traffic	555102.3	4178305	0	1.29E-03	1.04E-06	15.20	23.26	3.53
813	BT770	Barge Traffic	555108.3	4178255.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
814	BT771	Barge Traffic	555114.4	4178205.7	0	1.29E-03	1.04E-06	15.20	23.26	3.53
815	BT772	Barge Traffic	555119.6	4178156.4	0	1.29E-03	1.04E-06	15.20	23.26	3.53
816	BT773	Barge Traffic	555082.8	4178122.6	0	1.29E-03	1.04E-06	15.20	23.26	3.53
817	BT774	Barge Traffic	555045.9	4178088.8	0	1.29E-03	1.04E-06	15.20	23.26	3.53
818	BT775	Barge Traffic	555009	4178055	0	1.29E-03	1.04E-06	15.20	23.26	3.53
819	BT776	Barge Traffic	554972.2	4178021.3	-0.07	1.29E-03	1.04E-06	15.20	23.26	3.53
820	BT777	Barge Traffic	554935.3	4177987.5	0.18	1.29E-03	1.04E-06	15.20	23.26	3.53
821	UPLPPD1	Unpaved Loader Product Pile Dust	554837.2	4177800.9	5.45	0.167	1.40E-04	1.30	5.64	1.21
822	UPLPPD2	Unpaved Loader Product Pile Dust	554846.7	4177793.3	5.92	0.167	1.40E-04	1.30	5.64	1.21
823	UPLPPD3	Unpaved Loader Product Pile Dust	554858.1	4177789.5	6.29	0.167	1.40E-04	1.30	5.64	1.21
824	UPLPPD4	Unpaved Loader Product Pile Dust	554870.1	4177788.6	7.92	0.167	1.40E-04	1.30	5.64	1.21
825	UPLPPD5	Unpaved Loader Product Pile Dust	554881.9	4177791	5.81	0.167	1.40E-04	1.30	5.64	1.21
826	UPLPPD6	Unpaved Loader Product Pile Dust	554892.6	4177796.5	5.05	0.167	1.40E-04	1.30	5.64	1.21
827	UPLPPE1	Unpaved Loader Product Pile Exhaust	554837.2	4177800.9	5.45	0.167	5.40E-05	3.20	5.64	2.97
828	UPLPPE2	Unpaved Loader Product Pile Exhaust	554846.7	4177793.3	5.92	0.167	5.40E-05	3.20	5.64	2.97
829	UPLPPE3	Unpaved Loader Product Pile Exhaust	554858.1	4177789.5	6.29	0.167	5.40E-05	3.20	5.64	2.97
830	UPLPPE4	Unpaved Loader Product Pile Exhaust	554870.1	4177788.6	7.92	0.167	5.40E-05	3.20	5.64	2.97
831	UPLPPE5	Unpaved Loader Product Pile Exhaust	554881.9	4177791	5.81	0.167	5.40E-05	3.20	5.64	2.97
832	UPLPPE6	Unpaved Loader Product Pile Exhaust	554892.6	4177796.5	5.05	0.167	5.40E-05	3.20	5.64	2.97

Baseline Boundary

X coord (m)	Y coord (m)	Elevation (m)	Hill height scale (m)	Flagpole height (m)
554794.7	4177881.8	2.06	11.87	1.8
554814.6	4177883.6	4.37	11.87	1.8
554832.5	4177885.2	4.38	11.87	1.8
554832.3	4177887.2	4.29	11.87	1.8
554830.8	4177907.2	3.32	11.87	1.8
554829.2	4177927.1	2.3	11.87	1.8
554827.6	4177947.1	1.35	9.73	1.8
554827.2	4177952.1	1.18	9.73	1.8
554842.1	4177953.1	1.19	11.87	1.8
554842.9	4177953.2	1.18	11.87	1.8
554844.5	4177934.1	1.87	11.87	1.8
554846.2	4177914.1	2.97	11.87	1.8
554847.9	4177894.2	3.96	11.87	1.8
554848.5	4177886.7	4.11	11.87	1.8
554860.9	4177887.4	3.99	11.87	1.8
554880.9	4177888.5	4.12	11.87	1.8
554900.9	4177889.6	4.28	11.87	1.8
554916.2	4177890.4	4.71	11.87	1.8
554919.6	4177887.2	4.64	11.87	1.8
554926.7	4177880.7	4.61	11.87	1.8
554936	4177878.8	4.49	11.87	1.8
554936.1	4177877.9	4.45	11.87	1.8
554938.6	4177858.1	4.18	11.87	1.8
554941.1	4177838.2	5.69	6.39	1.8
554943.6	4177818.4	4.95	6.39	1.8
554946	4177798.5	5.8	5.8	1.8
554948.4	4177779.7	5.8	5.97	1.8
554947.4	4177779.6	5.69	5.97	1.8
554927.5	4177778.1	5.33	5.33	1.8
554907.5	4177776.6	5.56	11.23	1.8
554887.6	4177775.1	5.66	11.23	1.8
554867.6	4177773.6	5.82	11.23	1.8
554847.7	4177772.1	5.93	11.23	1.8
554827.7	4177770.6	6.04	11.23	1.8
554807.8	4177769.1	6.28	6.28	1.8
554805.5	4177768.9	6.24	6.24	1.8
554803.6	4177786.2	5.51	5.51	1.8
554801.7	4177806.1	5.35	11.23	1.8
554799.9	4177826	5.31	5.31	1.8
554798	4177846	4.84	9.73	1.8
554796.2	4177865.9	3.02	11.87	1.8

AERMOD Modeling Parameters - Project Operation Point Sources

AERMOD Source Group	Source Description	HRA Unit Rate (g/s)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate (g/s)	Release Height (m)	Stack Temp (K)	Stack Velocity (m/s)	Stack Diameter (m)	Notes
BH	Barge Hoteling	1	0.084	2.42E-03	15.2	573.15	20.00	0.30	Parameters are from the San Francisco Citywide HRA Table 8, towboats at-berth.
TI	Truck Idling	1	9.2E-07	2.63E-08	2.55	644	17.80	0.305	Parameters are from the San Francisco Citywide HRA Section 3.4. The release height reflects the that of on-road heavy-duty trucks, which is based on a vehicle height of 3.0 meters. All other point source parameters are from Table 7 for sources that have incomplete modeling information. Note that the Stack Diameter of 3.05 m is assumed to be a typo of the conversion of 1 feet in the parentheses.

AERMOD Modeling Parameters - Project Operation Area Sources

AERMOD Source Group	Source Description	Area (m^2)	HRA Unit Rate ($g/s\text{-}m^2$)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate ($g/s\text{-}m^2$)	Release Height (m)	Initial Vertical Dimension (m)	Road Length (m)	Percent Road Length (%)	Notes
RMS	Raw Material Stockpile	3072	3.26E-04	5.99E-03	5.61E-08	5.03	2.34	-	-	Per NSSGA section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per NSSGA section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. Raw material stockpile height is projected to be 33 ft.
PSS	Product Sand Stockpile	1245	8.03E-04	6.47E-04	1.49E-08	6.55	3.05	-	-	Per NSSGA section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per NSSGA section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. Product sand stockpile height is projected to be 43 ft.
OMS	Oversize Material Stockpile	59	1.68E-02	1.17E-04	5.64E-08	2.59	1.21	-	-	Per NSSGA section 5.2.7, the release height was estimated to be equal to half the average height of the stockpile. Per NSSGA section 4.1.2, the initial vertical dimension is the pile height divided by 4.3. Oversized material stockpile height is projected to be 17 ft.
OREE	Off-Road Equipment Exhaust	13688	7.31E-05	5.55E-03	1.17E-08	1.30	1.21	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks.
OTTHDA	Off-site Transfer Truck Highway Dust Area	22778	4.39E-05	1.05E-02	1.32E-08	3.40	3.16	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
OTTHEA	Off-site Transfer Truck Highway Exhaust Area	22778	4.39E-05	1.82E-03	2.30E-09	2.55	2.37	-	-	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
OTTCPDA	Off-site Transfer Truck Concrete Plant Dust Area	3341	2.99E-04	7.89E-03	6.79E-08	3.40	3.16	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
OTTCPEA	Off-site Transfer Truck Concrete Plant Exhaust Area	3341	2.99E-04	4.93E-04	4.24E-09	2.55	2.37	-	-	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
UPLDA	Unpaved Loader Dust Area	441	2.27E-03	1.61E-02	1.05E-06	1.30	1.21	-	-	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks.
UPLEA	Unpaved Loader Exhaust Area	441	2.27E-03	3.67E-02	7.38E-07	3.20	2.97	57.7	31%	Per Appendix E Table 8. Source release height represents equipment-specific exhaust height above ground multiplied by a factor of 1.7 to account for the source's motion and 0.5. The exhaust emissions are surface-based sources; therefore, the initial vertical dimension is the plume height divided by 2.15.
PLDA	Paved Loader Dust Area	279	3.58E-03	7.23E-02	1.57E-06	1.30	1.21	27.3	21%	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for nontrucks.
PLEA	Paved Loader Exhaust Area	279	3.58E-03	3.67E-02	5.52E-07	3.20	2.97	27.3	15%	Per Appendix E Table 8. Source release height represents equipment-specific exhaust height above ground multiplied by a factor of 1.7 to account for the source's motion and 0.5. The exhaust emissions are surface-based sources; therefore, the initial vertical dimension is the plume height divided by 2.15.
PTTDA_1	Paved Transfer Truck Dust Area 1	40.0	2.50E-02	1.07E-01	3.20E-06	3.40	3.16	10	4.17%	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
PTTEA_1	Paved Transfer Truck Exhaust Area 1	40.0	2.50E-02	3.27E-04	7.50E-09	2.55	2.37	10	3.19%	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.
PTTDA_2	Paved Transfer Truck Dust Area 2	373	2.68E-03	1.07E-01	2.50E-06	3.40	3.16	72.6	30.30%	Per Air District's Appendix E CEQA Guidelines Table 11, recommendations for trucks.
PTTEA_2	Paved Transfer Truck Exhaust Area 2	709	1.41E-03	3.27E-04	6.18E-09	2.55	2.37	146	46.65%	Per City of San Francisco Citywide HRA Section 3.4 On-Road Mobile Sources recommended parameters for heavy-duty trucks.

AERMOD Modeling Parameters - Project Operation Volume Sources

AERMOD Source Group	Source Description	# of Sources	HRA Unit Rate (g/s)	$PM_{2.5}$ Unit Rate (tpy)	$PM_{2.5}$ Unit Rate (g/s)	Release Height (m)	Initial Lateral Dimension (m)	Initial Vertical Dimension (m)	Exclusion Zone	Road Length (m)	Percent Road Length (%)	Notes
TP1	TP 1 – Off-loaded Pile to Hopper	1	1.0	5.94E-02	1.71E-03	3.05	0.81	1.77	-	-	-	Per NSSGA section 5.3.6.5 guidance for Truck unloading and loader equipment specifications.
TP2	TP 2 – Hopper to Conveyor	1	1.0	1.78E-02	5.13E-04	1.59	0.18	0.25	-	-	-	Per NSSGA section 5.3.2 for single, elevated, conveyor transfer points. The release height is equal to the distance from the ground to the center of the source, the initial lateral dimension is equal to the width of the conveyor divided by 4.3, and the initial vertical dimension is equal to the plume height (the total drop distance) divided by 4.3.
TP3	TP 3 – Conveyor to Scalping Screen	1	1.0	1.78E-02	5.13E-04	6.25	0.18	2.06	-	-	-	Per NSSGA section 5.3.2 for single, elevated, conveyor transfer points. The release height is equal to the distance from the ground to the center of the source, the initial lateral dimension is equal to the width of the conveyor divided by 4.3, and the initial vertical dimension is equal to the plume height (the total drop distance) divided by 4.3.
PLRD	Paved Loader Two-Way Road Dust	5	0.2	7.23E-02	3.28E-04	1.30	9.90	1.21	22.28	102	79%	Same release height and initial vertical dimension as Paved Loader Dust Area. Per Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for a two lane roadway is the road width plus 6 meters over 2.15. The road width is estimated in Google Earth.
PLRE	Paved Loader Two-Way Road Exhaust	5	0.2	3.67E-02	1.15E-04	3.20	9.90	2.97	22.28	102	55%	Same release height and initial vertical dimension as Paved Loader Exhaust Area. Per Air District's Appendix E CEQA Guidelines Table 11, the initial lateral dimension for a two lane roadway is the road width plus 6 meters over 2.15. The road width is estimated in Google Earth.
PTTRD	Paved Transfer Truck One-Way Road Dust	18	0.0556	1.07E-01	1.12E-04	3.40	4.09	3.16	9.79	157	65.53%	Same release height and initial vertical dimension as Paved Transfer Truck Dust Area. Per EPA Haul Road Workgroup Final Report, the initial lateral dimension for one lane roadways is the vehicle width plus 6 meters over 2.15. The Transfer Truck vehicle width is approximated to be equal to the wheel wash width, 110 inches.
PTTRE	Paved Transfer Truck One-Way Road Exhaust	18	0.0556	3.27E-04	2.62E-07	2.55	4.09	2.37	9.79	157	50.16%	Same release height and initial vertical dimension as Paved Transfer Truck Exhaust Area. Per EPA Haul Road Workgroup Final Report, the initial lateral dimension for one lane roadways is the vehicle width plus 6 meters over 2.15. The Transfer Truck vehicle width is approximated to be equal to the wheel wash width, 110 inches.
BT	Barge Traffic	777	0.001287	6.37E-02	2.36E-06	15.20	23.26	3.53	-	-	-	Parameters are from the San Francisco Citywide HRA Table 8. Release height and point source parameters reflect Assist Tugs in Routes (near) mode.

Project Point Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Stack Height	Stack Temp	Stack Velocity	Stack Diameter
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(K)	(m/s)	(m)
1	TI	Truck Idling	554902.5	4177761.9	5.73	1.00	2.63E-08	2.55	644.00	17.80	0.305
2	BH	Barge Hoteling	554913.2	4177966.8	0.67	1.00	2.42E-03	15.20	573.15	20.00	0.30

Project Circle Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Radius	Vertices	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	-	(m)
1	PSS	Product Sand Stockpile	554898.1	4177791.4	5.24	8.03E-04	1.49E-08	6.55	19.90926	20	3.05
2	OMS	Oversize Material Stockpile	554924.5	4177866.8	4.51	1.68E-02	5.64E-08	2.59	4.349648	20	1.21

Project Polygon Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)
1	RMS	Raw Material Stockpile	554809.5	4177887.9	4.56	3.26E-04	5.61E-08	5.03	2.34
2	OREE	Off-Road Equipment Exhaust	554806.5	4177860	4.17	7.31E-05	1.17E-08	1.30	1.21
3	OTTHDA	Off-site Transfer Truck Highway Dust Area	554782.1	4177759.6	6.13	4.39E-05	1.32E-08	3.40	3.16
4	OTTHEA	Off-site Transfer Truck Highway Exhaust Area	554782.1	4177759.6	6.13	4.39E-05	2.30E-09	2.55	2.37
5	PTTDA_2	Paved Transfer Truck Dust Area 2	554924.9	4177784.6	5.37	2.68E-03	2.50E-06	3.40	3.16
6	PTTEA_2	Paved Transfer Truck Exhaust Area 2	554924.9	4177784.6	5.37	1.41E-03	6.18E-09	2.55	2.37
7	PLDA	Paved Loader Dust Area	554804.1	4177856.6	4.39	3.58E-03	1.57E-06	1.30	1.21
8	PLEA	Paved Loader Exhaust Area	554804.1	4177856.6	4.39	3.58E-03	5.52E-07	3.20	2.97
9	UPLDA	Unpaved Loader Dust Area	554880.2	4177763.7	5.89	2.27E-03	1.05E-06	1.30	1.21
10	UPLEA	Unpaved Loader Exhaust Area	554880.2	4177763.7	5.89	2.27E-03	7.38E-07	3.20	2.97
11	OTTCPDA	Off-site Transfer Truck Concrete Plant Dust Area	554766.7	4177825.8	4.83	2.99E-04	6.79E-08	3.40	3.16
12	OTTCPEA	Off-site Transfer Truck Concrete Plant Exhaust Area	554766.7	4177825.8	4.83	2.99E-04	4.24E-09	2.55	2.37

Project Rectangle Area Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	X Length	Y Length	Angle	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)	-	(m)
1	PTTDA_1	Paved Transfer Truck Dust Area 1	554805.6	4177840.4	5.09	2.50E-02	3.20E-06	3.40	4.09	9.79	87.3	3.16
2	PTTEA_1	Paved Transfer Truck Exhaust Area 1	554805.6	4177840.4	5.09	2.50E-02	7.50E-09	2.55	4.09	9.79	87.3	2.37

Project Volume Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
1	TP1	TP 1 – Off-loaded Pile to Hopper	554887.7	4177831	5.07	1.0	1.71E-03	3.05	0.81	1.77
2	TP2	TP 2 – Hopper to Conveyor	554891	4177832.7	5.02	1.0	5.13E-04	1.59	0.18	0.25
3	TP3	TP 3 – Conveyor to Scalping Screen	554920.6	4177851.6	4.4	1.0	5.13E-04	6.25	0.18	2.06
4	PLRD1	Paved Loader Two-Way Road Dust	554835.7	4177835.3	5	2.00E-01	3.28E-04	1.30	9.90	1.21
5	PLRD2	Paved Loader Two-Way Road Dust	554856.3	4177831.8	5.23	2.00E-01	3.28E-04	1.30	9.90	1.21
6	PLRD3	Paved Loader Two-Way Road Dust	554876.6	4177836.9	6.43	2.00E-01	3.28E-04	1.30	9.90	1.21
7	PLRD4	Paved Loader Two-Way Road Dust	554893.1	4177850	4.17	2.00E-01	3.28E-04	1.30	9.90	1.21
8	PLRD5	Paved Loader Two-Way Road Dust	554905.6	4177867.2	4.47	2.00E-01	3.28E-04	1.30	9.90	1.21
9	PLRE1	Paved Loader Two-Way Road Exhaust	554835.7	4177835.3	5	2.00E-01	1.15E-04	3.20	9.90	2.97
10	PLRE2	Paved Loader Two-Way Road Exhaust	554856.3	4177831.8	5.23	2.00E-01	1.15E-04	3.20	9.90	2.97
11	PLRE3	Paved Loader Two-Way Road Exhaust	554876.6	4177836.9	6.43	2.00E-01	1.15E-04	3.20	9.90	2.97
12	PLRE4	Paved Loader Two-Way Road Exhaust	554893.1	4177850	4.17	2.00E-01	1.15E-04	3.20	9.90	2.97
13	PLRE5	Paved Loader Two-Way Road Exhaust	554905.6	4177867.2	4.47	2.00E-01	1.15E-04	3.20	9.90	2.97
14	PTTRD1	Paved Transfer Truck One-Way Road Dust	554818.2	4177835.4	5.44	5.56E-02	1.12E-04	3.40	4.09	3.16
15	PTTRD2	Paved Transfer Truck One-Way Road Dust	554826.1	4177831.5	5.19	5.56E-02	1.12E-04	3.40	4.09	3.16
16	PTTRD3	Paved Transfer Truck One-Way Road Dust	554833.9	4177827.6	5.2	5.56E-02	1.12E-04	3.40	4.09	3.16
17	PTTRD4	Paved Transfer Truck One-Way Road Dust	554842.1	4177824.3	5.46	5.56E-02	1.12E-04	3.40	4.09	3.16
18	PTTRD5	Paved Transfer Truck One-Way Road Dust	554850.5	4177821.9	9.65	5.56E-02	1.12E-04	3.40	4.09	3.16
19	PTTRD6	Paved Transfer Truck One-Way Road Dust	554859.2	4177820.5	8.29	5.56E-02	1.12E-04	3.40	4.09	3.16
20	PTTRD7	Paved Transfer Truck One-Way Road Dust	554868.0	4177820.6	4.7	5.56E-02	1.12E-04	3.40	4.09	3.16
21	PTTRD8	Paved Transfer Truck One-Way Road Dust	554876.8	4177821.1	4.71	5.56E-02	1.12E-04	3.40	4.09	3.16
22	PTTRD9	Paved Transfer Truck One-Way Road Dust	554885.5	4177822.1	4.75	5.56E-02	1.12E-04	3.40	4.09	3.16
23	PTTRD10	Paved Transfer Truck One-Way Road Dust	554894.2	4177823.1	4.84	5.56E-02	1.12E-04	3.40	4.09	3.16
24	PTTRD11	Paved Transfer Truck One-Way Road Dust	554903.0	4177824.2	4.94	5.56E-02	1.12E-04	3.40	4.09	3.16
25	PTTRD12	Paved Transfer Truck One-Way Road Dust	554911.8	4177824.6	5.02	5.56E-02	1.12E-04	3.40	4.09	3.16
26	PTTRD13	Paved Transfer Truck One-Way Road Dust	554920.5	4177824.1	5.07	5.56E-02	1.12E-04	3.40	4.09	3.16
27	PTTRD14	Paved Transfer Truck One-Way Road Dust	554928.7	4177821.1	5.01	5.56E-02	1.12E-04	3.40	4.09	3.16
28	PTTRD15	Paved Transfer Truck One-Way Road Dust	554932.9	4177813.8	5.05	5.56E-02	1.12E-04	3.40	4.09	3.16
29	PTTRD16	Paved Transfer Truck One-Way Road Dust	554932.8	4177805.1	5.06	5.56E-02	1.12E-04	3.40	4.09	3.16
30	PTTRD17	Paved Transfer Truck One-Way Road Dust	554931.2	4177796.5	5.14	5.56E-02	1.12E-04	3.40	4.09	3.16
31	PTTRD18	Paved Transfer Truck One-Way Road Dust	554929.1	4177788.0	5.28	5.56E-02	1.12E-04	3.40	4.09	3.16
32	PTTRE1	Paved Transfer Truck One-Way Road Exhaust	554818.2	4177835.4	5.44	5.56E-02	2.62E-07	2.55	4.09	2.37
33	PTTRE2	Paved Transfer Truck One-Way Road Exhaust	554826.1	4177831.5	5.19	5.56E-02	2.62E-07	2.55	4.09	2.37
34	PTTRE3	Paved Transfer Truck One-Way Road Exhaust	554833.9	4177827.6	5.2	5.56E-02	2.62E-07	2.55	4.09	2.37
35	PTTRE4	Paved Transfer Truck One-Way Road Exhaust	554842.1	4177824.3	5.46	5.56E-02	2.62E-07	2.55	4.09	2.37
36	PTTRE5	Paved Transfer Truck One-Way Road Exhaust	554850.5	4177821.9	9.65	5.56E-02	2.62E-07	2.55	4.09	2.37
37	PTTRE6	Paved Transfer Truck One-Way Road Exhaust	554859.2	4177820.5	8.29	5.56E-02	2.62E-07	2.55	4.09	2.37
38	PTTRE7	Paved Transfer Truck One-Way Road Exhaust	554868.0	4177820.6	4.7	5.56E-02	2.62E-07	2.55	4.09	2.37
39	PTTRE8	Paved Transfer Truck One-Way Road Exhaust	554876.8	4177821.1	4.71	5.56E-02	2.62E-07	2.55	4.09	2.37
40	PTTRE9	Paved Transfer Truck One-Way Road Exhaust	554885.5	4177822.1	4.75	5.56E-02	2.62E-07	2.55	4.09	2.37
41	PTTRE10	Paved Transfer Truck One-Way Road Exhaust	554894.2	4177823.1	4.84	5.56E-02	2.62E-07	2.55	4.09	2.37
42	PTTRE11	Paved Transfer Truck One-Way Road Exhaust	554903.0	4177824.2	4.94	5.56E-02	2.62E-07	2.55	4.09	2.37
43	PTTRE12	Paved Transfer Truck One-Way Road Exhaust	554911.8	4177824.6	5.02	5.56E-02	2.62E-07	2.55	4.09	2.37
44	PTTRE13	Paved Transfer Truck One-Way Road Exhaust	554920.5	4177824.1	5.07	5.56E-02	2.62E-07	2.55	4.09	2.37
45	PTTRE14	Paved Transfer Truck One-Way Road Exhaust	554928.7	4177821.1	5.01	5.56E-02	2.62E-07	2.55	4.09	2.37
46	PTTRE15	Paved Transfer Truck One-Way Road Exhaust	554932.9	4177813.8	5.05	5.56E-02	2.62E-07	2.55	4.09	2.37
47	PTTRE16	Paved Transfer Truck One-Way Road Exhaust	554932.8	4177805.1	5.06	5.56E-02	2.62E-07	2.55	4.09	2.37
48	PTTRE17	Paved Transfer Truck One-Way Road Exhaust	554931.2	4177796.5	5.14	5.56E-02	2.62E-07	2.55	4.09	2.37
49	PTTRE18	Paved Transfer Truck One-Way Road Exhaust	554929.1	4177788.0	5.28	5.56E-02	2.62E-07	2.55	4.09	2.37
50	BT1	Barge Traffic	568307.9	4178548.1	-0.29	1.29E-03	2.36E-06	15.20	23.26	3.53
51	BT2	Barge Traffic	568318.5	4178597	-0.29	1.29E-03	2.36E-06	15.20	23.26	3.53
52	BT3	Barge Traffic	568329	4178645.9	-0.29	1.29E-03	2.36E-06	15.20	23.26	3.53
53	BT4	Barge Traffic	568339.6	4178694.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
54	BT5	Barge Traffic	568350.2	4178743.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
55	BT6	Barge Traffic	568360.8	4178792.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
56	BT7	Barge Traffic	568371.3	4178841.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
57	BT8	Barge Traffic	568381.9	4178890.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
58	BT9	Barge Traffic	568392.5	4178939.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
59	BT10	Barge Traffic	568403	4178988	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
60	BT11	Barge Traffic	568413.6	4179036.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
61	BT12	Barge Traffic	568424.2	4179085.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
62	BT13	Barge Traffic	568434.8	4179134.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
63	BT14	Barge Traffic	568430.3	4179184.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
64	BT15	Barge Traffic	568423.8	4179233.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
65	BT16	Barge Traffic	568417.4	4179283.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
66	BT17	Barge Traffic	568410.9	4179332.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
67	BT18	Barge Traffic	568404.4	4179382.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
68	BT19	Barge Traffic	568398	4179432	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
69	BT20	Barge Traffic	568391.5	4179481.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
70	BT21	Barge Traffic	568385	4179531.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
71	BT22	Barge Traffic	568378.6	4179580.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
72	BT23	Barge Traffic	568372.1	4179630.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
73	BT24	Barge Traffic	568365.6	4179679.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
74	BT25	Barge Traffic	568359.1	4179729.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
75	BT26	Barge Traffic	568352.7	4179779	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
76	BT27	Barge Traffic	568346.2	4179828.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
77	BT28	Barge Traffic	568339.7	4179878.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
78	BT29	Barge Traffic	568321.1	4179921.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
79	BT30	Barge Traffic	568285.8	4179957.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
80	BT31	Barge Traffic	568250.4	4179992.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
81	BT32	Barge Traffic	568215	4180027.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
82	BT33	Barge Traffic	568179.7	4180063.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
83	BT34	Barge Traffic	568144.3	4180098.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
84	BT35	Barge Traffic	568109	4180133.9	0.92	1.29E-03	2.36E-06	15.20	23.26	3.53
85	BT36	Barge Traffic	568073.6	4180169.2	1.81	1.29E-03	2.36E-06	15.20	23.26	3.53
86	BT37	Barge Traffic	568038.2	4180204.6	2.6	1.29E-03	2.36E-06	15.20	23.26	3.53
87	BT38	Barge Traffic	567999.8	4180236.1	3.54	1.29E-03	2.36E-06	15.20	23.26	3.53
88	BT39	Barge Traffic	567957.8	4180263.3	4.83	1.29E-03	2.36E-06	15.20	23.26	3.53
89	BT40	Barge Traffic	567915.8	4180290.4	4.84	1.29E-03	2.36E-06	15.20	23.26	3.53
90	BT41	Barge Traffic	567873.8	4180317.6	5.04	1.29E-03	2.36E-06	15.20	23.26	3.53
91	BT42	Barge Traffic	567831.8	4180344.7	4.79	1.29E-03	2.36E-06	15.20	23.26	3.53
92	BT43	Barge Traffic	567789.9	4180371.9	4.52	1.29E-03	2.36E-06	15.20	23.26	3.53
93	BT44	Barge Traffic	567747.9	4180399	6.26	1.29E-03	2.36E-06	15.20	23.26	3.53
94	BT45	Barge Traffic	567705.9	4180426.1	4.46	1.29E-03	2.36E-06	15.20	23.26	3.53
95	BT46	Barge Traffic	567663.9	4180453.3	4.29	1.29E-03	2.36E-06	15.20	23.26	3.53
96	BT47	Barge Traffic	567621.9	4180480.4	3.66	1.29E-03	2.36E-06	15.20	23.26	3.53
97	BT48	Barge Traffic	567579.9	4180507.6	2.83	1.29E-03	2.36E-06	15.20	23.26	3.53
98	BT49	Barge Traffic	567537.9	4180534.7	1.57	1.29E-03	2.36E-06	15.20	23.26	3.53
99	BT50	Barge Traffic	567495.9	4180561.9	1.45	1.29E-03	2.36E-06	15.20	23.26	3.53
100	BT51	Barge Traffic	567454	4180589	0.64	1.29E-03	2.36E-06	15.20	23.26	3.53
101	BT52	Barge Traffic	567412	4180616.2	0.63	1.29E-03	2.36E-06	15.20	23.26	3.53
102	BT53	Barge Traffic	567370	4180643.3	0.64	1.29E-03	2.36E-06	15.20	23.26	3.53
103	BT54	Barge Traffic	567328	4180670.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
104	BT55	Barge Traffic	567286	4180697.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
105	BT56	Barge Traffic	567244	4180724.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
106	BT57	Barge Traffic	567202	4180751.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
107	BT58	Barge Traffic	567160	4180779.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
108	BT59	Barge Traffic	567118	4180806.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
109	BT60	Barge Traffic	567076.1	4180833.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
110	BT61	Barge Traffic	567034.1	4180860.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
111	BT62	Barge Traffic	566992.1	4180887.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
112	BT63	Barge Traffic	566950.1	4180914.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
113	BT64	Barge Traffic	566908.1	4180942	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
114	BT65	Barge Traffic	566866.1	4180969.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
115	BT66	Barge Traffic	566824.1	4180996.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
116	BT67	Barge Traffic	566782.1	4181023.4	0.62	1.29E-03	2.36E-06	15.20	23.26	3.53
117	BT68	Barge Traffic	566740.2	4181050.6	1.35	1.29E-03	2.36E-06	15.20	23.26	3.53
118	BT69	Barge Traffic	566698.2	4181077.7	0.94	1.29E-03	2.36E-06	15.20	23.26	3.53
119	BT70	Barge Traffic	566656.2	4181104.9	0.92	1.29E-03	2.36E-06	15.20	23.26	3.53
120	BT71	Barge Traffic	566614.2	4181132	0.74	1.29E-03	2.36E-06	15.20	23.26	3.53
121	BT72	Barge Traffic	566572.2	4181159.1	0.62	1.29E-03	2.36E-06	15.20	23.26	3.53
122	BT73	Barge Traffic	566530.2	4181186.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
123	BT74	Barge Traffic	566488.2	4181213.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
124	BT75	Barge Traffic	566446.2	4181240.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
125	BT76	Barge Traffic	566404.3	4181267.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
126	BT77	Barge Traffic	566362.3	4181294.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
127	BT78	Barge Traffic	566320.3	4181322	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
128	BT79	Barge Traffic	566278.3	4181349.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
129	BT80	Barge Traffic	566236.3	4181376.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
130	BT81	Barge Traffic	566194.3	4181403.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
131	BT82	Barge Traffic	566152.3	4181430.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
132	BT83	Barge Traffic	566110.3	4181457.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
133	BT84	Barge Traffic	566068.4	4181484.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
134	BT85	Barge Traffic	566026.4	4181512.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
135	BT86	Barge Traffic	565984.4	4181539.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
136	BT87	Barge Traffic	565942.4	4181566.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
137	BT88	Barge Traffic	565900.4	4181593.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
138	BT89	Barge Traffic	565858.4	4181620.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
139	BT90	Barge Traffic	565816.4	4181647.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
140	BT91	Barge Traffic	565774.4	4181675	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
141	BT92	Barge Traffic	565732.4	4181702.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
142	BT93	Barge Traffic	565690.5	4181729.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
143	BT94	Barge Traffic	565648.5	4181756.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
144	BT95	Barge Traffic	565606.5	4181783.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53

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145	BT96	Barge Traffic	565564.5	4181810.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
146	BT97	Barge Traffic	565522.5	4181837.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
147	BT98	Barge Traffic	565480.5	4181865	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
148	BT99	Barge Traffic	565438.5	4181892.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
149	BT100	Barge Traffic	565396.5	4181919.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
150	BT101	Barge Traffic	565354.6	4181946.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
151	BT102	Barge Traffic	565312.6	4181973.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
152	BT103	Barge Traffic	565270.6	4182000.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
153	BT104	Barge Traffic	565228.6	4182027.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
154	BT105	Barge Traffic	565186.6	4182055	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
155	BT106	Barge Traffic	565144.6	4182082.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
156	BT107	Barge Traffic	565102.6	4182109.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
157	BT108	Barge Traffic	565060.6	4182136.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
158	BT109	Barge Traffic	565018.7	4182163.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
159	BT110	Barge Traffic	564976.7	4182190.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
160	BT111	Barge Traffic	564934.7	4182217.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
161	BT112	Barge Traffic	564892.7	4182245.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
162	BT113	Barge Traffic	564850.7	4182272.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
163	BT114	Barge Traffic	564808.7	4182299.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
164	BT115	Barge Traffic	564766.7	4182326.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
165	BT116	Barge Traffic	564724.7	4182353.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
166	BT117	Barge Traffic	564682.8	4182380.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
167	BT118	Barge Traffic	564640.8	4182408	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
168	BT119	Barge Traffic	564598.8	4182435.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
169	BT120	Barge Traffic	564556.8	4182462.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
170	BT121	Barge Traffic	564514.8	4182489.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
171	BT122	Barge Traffic	564472.8	4182516.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
172	BT123	Barge Traffic	564430.8	4182543.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
173	BT124	Barge Traffic	564388.8	4182570.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
174	BT125	Barge Traffic	564346.8	4182598	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
175	BT126	Barge Traffic	564304.9	4182625.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
176	BT127	Barge Traffic	564262.9	4182652.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
177	BT128	Barge Traffic	564220.9	4182679.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
178	BT129	Barge Traffic	564178.9	4182706.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
179	BT130	Barge Traffic	564135.6	4182731.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
180	BT131	Barge Traffic	564090.3	4182752.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
181	BT132	Barge Traffic	564045	4182773.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
182	BT133	Barge Traffic	563999.6	4182794.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
183	BT134	Barge Traffic	563954.3	4182815.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
184	BT135	Barge Traffic	563909	4182836.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
185	BT136	Barge Traffic	563863.6	4182857.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
186	BT137	Barge Traffic	563818.3	4182879	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
187	BT138	Barge Traffic	563772.9	4182900.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
188	BT139	Barge Traffic	563727.6	4182921.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
189	BT140	Barge Traffic	563682.3	4182942.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
190	BT141	Barge Traffic	563636.9	4182963.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
191	BT142	Barge Traffic	563591.6	4182984.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
192	BT143	Barge Traffic	563546.3	4183005.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
193	BT144	Barge Traffic	563500.9	4183026.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
194	BT145	Barge Traffic	563455.6	4183047.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
195	BT146	Barge Traffic	563407.7	4183053.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
196	BT147	Barge Traffic	563357.9	4183049.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
197	BT148	Barge Traffic	563308.2	4183044.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
198	BT149	Barge Traffic	563258.4	4183039.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
199	BT150	Barge Traffic	563208.6	4183034.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
200	BT151	Barge Traffic	563158.9	4183029.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
201	BT152	Barge Traffic	563109.1	4183025.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
202	BT153	Barge Traffic	563059.3	4183020.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
203	BT154	Barge Traffic	563009.6	4183015.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
204	BT155	Barge Traffic	562959.8	4183010.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
205	BT156	Barge Traffic	562910	4183005.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
206	BT157	Barge Traffic	562860.3	4183001.1	0.63	1.29E-03	2.36E-06	15.20	23.26	3.53
207	BT158	Barge Traffic	562810.5	4182996.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
208	BT159	Barge Traffic	562760.7	4182991.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
209	BT160	Barge Traffic	562711	4182986.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
210	BT161	Barge Traffic	562661.2	4182981.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
211	BT162	Barge Traffic	562611.4	4182977.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
212	BT163	Barge Traffic	562561.6	4182972.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
213	BT164	Barge Traffic	562511.9	4182967.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
214	BT165	Barge Traffic	562462.1	4182962.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
215	BT166	Barge Traffic	562412.3	4182957.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
216	BT167	Barge Traffic	562362.6	4182953	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
217	BT168	Barge Traffic	562312.8	4182948.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
218	BT169	Barge Traffic	562263	4182943.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
219	BT170	Barge Traffic	562213.3	4182938.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
220	BT171	Barge Traffic	562163.5	4182933.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
221	BT172	Barge Traffic	562113.7	4182929	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
222	BT173	Barge Traffic	562064	4182924.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
223	BT174	Barge Traffic	562014.2	4182919.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
224	BT175	Barge Traffic	561964.4	4182914.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
225	BT176	Barge Traffic	561914.7	4182909.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
226	BT177	Barge Traffic	561864.9	4182905	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
227	BT178	Barge Traffic	561815.1	4182900.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
228	BT179	Barge Traffic	561765.3	4182895.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
229	BT180	Barge Traffic	561715.6	4182890.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
230	BT181	Barge Traffic	561665.8	4182885.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
231	BT182	Barge Traffic	561616	4182881	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
232	BT183	Barge Traffic	561566.3	4182876.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
233	BT184	Barge Traffic	561517.1	4182878.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
234	BT185	Barge Traffic	561468.8	4182891.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
235	BT186	Barge Traffic	561420.5	4182904.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
236	BT187	Barge Traffic	561372.2	4182917.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
237	BT188	Barge Traffic	561323.9	4182930.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
238	BT189	Barge Traffic	561275.6	4182943	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
239	BT190	Barge Traffic	561227.3	4182955.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
240	BT191	Barge Traffic	561178.9	4182968.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
241	BT192	Barge Traffic	561130.6	4182981.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
242	BT193	Barge Traffic	561082.3	4182994.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
243	BT194	Barge Traffic	561034	4183007.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
244	BT195	Barge Traffic	560985.7	4183020.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
245	BT196	Barge Traffic	560937.4	4183033.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
246	BT197	Barge Traffic	560889.1	4183046.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
247	BT198	Barge Traffic	560840.8	4183059.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
248	BT199	Barge Traffic	560792.5	4183072	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
249	BT200	Barge Traffic	560744.2	4183084.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
250	BT201	Barge Traffic	560695.9	4183097.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
251	BT202	Barge Traffic	560647.6	4183110.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
252	BT203	Barge Traffic	560599.3	4183123.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
253	BT204	Barge Traffic	560551	4183136.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
254	BT205	Barge Traffic	560502.7	4183149.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
255	BT206	Barge Traffic	560454.3	4183162.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
256	BT207	Barge Traffic	560406	4183175.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
257	BT208	Barge Traffic	560357.7	4183188.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
258	BT209	Barge Traffic	560309.4	4183201.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
259	BT210	Barge Traffic	560261.1	4183214	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
260	BT211	Barge Traffic	560212.8	4183226.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
261	BT212	Barge Traffic	560164.5	4183239.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
262	BT213	Barge Traffic	560116.2	4183252.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
263	BT214	Barge Traffic	560067.9	4183265.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
264	BT215	Barge Traffic	560019.6	4183278.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
265	BT216	Barge Traffic	559971.3	4183291.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
266	BT217	Barge Traffic	559923	4183304.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
267	BT218	Barge Traffic	559874.7	4183317.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
268	BT219	Barge Traffic	559826.4	4183330.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
269	BT220	Barge Traffic	559778.1	4183343	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
270	BT221	Barge Traffic	559729.8	4183355.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
271	BT222	Barge Traffic	559681.4	4183368.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
272	BT223	Barge Traffic	559633.1	4183381.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
273	BT224	Barge Traffic	559584.8	4183394.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
274	BT225	Barge Traffic	559536.5	4183407.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
275	BT226	Barge Traffic	559488.2	4183420.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
276	BT227	Barge Traffic	559439.9	4183433.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
277	BT228	Barge Traffic	559391.6	4183446.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
278	BT229	Barge Traffic	559343.3	4183459.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
279	BT230	Barge Traffic	559295	4183472	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
280	BT231	Barge Traffic	559246.7	4183484.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
281	BT232	Barge Traffic	559198.4	4183497.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
282	BT233	Barge Traffic	559150.1	4183510.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
283	BT234	Barge Traffic	559101.8	4183523.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
284	BT235	Barge Traffic	559053.5	4183536.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
285	BT236	Barge Traffic	559005.2	4183549.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
286	BT237	Barge Traffic	558956.8	4183562.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
287	BT238	Barge Traffic	558908.5	4183575.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
288	BT239	Barge Traffic	558860.2	4183588.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
289	BT240	Barge Traffic	558812.9	4183604.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
290	BT241	Barge Traffic	558765.8	4183620.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
291	BT242	Barge Traffic	558718.6	4183637.5	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
292	BT243	Barge Traffic	558671.5	4183654.2	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
293	BT244	Barge Traffic	558624.3	4183670.8	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
294	BT245	Barge Traffic	558577.2	4183687.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
295	BT246	Barge Traffic	558530	4183704.1	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
296	BT247	Barge Traffic	558482.9	4183720.7	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
297	BT248	Barge Traffic	558435.7	4183737.4	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
298	BT249	Barge Traffic	558388.6	4183754	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
299	BT250	Barge Traffic	558341.4	4183770.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
300	BT251	Barge Traffic	558294.3	4183787.3	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
301	BT252	Barge Traffic	558247.1	4183803.9	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
302	BT253	Barge Traffic	558200	4183820.6	0.61	1.29E-03	2.36E-06	15.20	23.26	3.53
303	BT254	Barge Traffic	558152.8	4183837.2	0.6	1.29E-03	2.36E-06	15.20	23.26	3.53
304	BT255	Barge Traffic	558105.7	4183853.8	0.49	1.29E-03	2.36E-06	15.20	23.26	3.53
305	BT256	Barge Traffic	558058.5	4183870.5	0.23	1.29E-03	2.36E-06	15.20	23.26	3.53
306	BT257	Barge Traffic	558011.4	4183887.1	-0.38	1.29E-03	2.36E-06	15.20	23.26	3.53
307	BT258	Barge Traffic	557964.2	4183903.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
308	BT259	Barge Traffic	557917.1	4183920.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
309	BT260	Barge Traffic	557869.9	4183937	0	1.29E-03	2.36E-06	15.20	23.26	3.53
310	BT261	Barge Traffic	557822.8	4183953.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
311	BT262	Barge Traffic	557775.6	4183970.3	0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
312	BT263	Barge Traffic	557728.5	4183986.9	0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
313	BT264	Barge Traffic	557679	4183991.2	0.03	1.29E-03	2.36E-06	15.20	23.26	3.53
314	BT265	Barge Traffic	557629	4183992.8	0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
315	BT266	Barge Traffic	557579	4183994.4	0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
316	BT267	Barge Traffic	557529.1	4183996	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
317	BT268	Barge Traffic	557479.1	4183997.6	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
318	BT269	Barge Traffic	557429.1	4183999.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
319	BT270	Barge Traffic	557379.1	4184000.7	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
320	BT271	Barge Traffic	557329.2	4184002.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
321	BT272	Barge Traffic	557279.2	4184003.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
322	BT273	Barge Traffic	557229.2	4184005.5	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
323	BT274	Barge Traffic	557179.2	4184007.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
324	BT275	Barge Traffic	557129.3	4184008.7	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
325	BT276	Barge Traffic	557079.3	4184010.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
326	BT277	Barge Traffic	557029.3	4184011.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
327	BT278	Barge Traffic	556979.3	4184013.4	0.03	1.29E-03	2.36E-06	15.20	23.26	3.53
328	BT279	Barge Traffic	556929.4	4184015	0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
329	BT280	Barge Traffic	556879.4	4184016.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
330	BT281	Barge Traffic	556829.4	4184018.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
331	BT282	Barge Traffic	556779.4	4184019.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
332	BT283	Barge Traffic	556729.5	4184021.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
333	BT284	Barge Traffic	556679.5	4184023	0	1.29E-03	2.36E-06	15.20	23.26	3.53
334	BT285	Barge Traffic	556629.5	4184024.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
335	BT286	Barge Traffic	556579.5	4184026.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
336	BT287	Barge Traffic	556529.6	4184027.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
337	BT288	Barge Traffic	556479.6	4184029.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
338	BT289	Barge Traffic	556429.6	4184030.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
339	BT290	Barge Traffic	556379.6	4184032.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
340	BT291	Barge Traffic	556329.7	4184034.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
341	BT292	Barge Traffic	556279.7	4184035.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
342	BT293	Barge Traffic	556229.7	4184037.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
343	BT294	Barge Traffic	556179.7	4184038.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
344	BT295	Barge Traffic	556129.8	4184040.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
345	BT296	Barge Traffic	556079.8	4184042	0	1.29E-03	2.36E-06	15.20	23.26	3.53
346	BT297	Barge Traffic	556029.8	4184043.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
347	BT298	Barge Traffic	555979.8	4184045.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
348	BT299	Barge Traffic	555929.9	4184046.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
349	BT300	Barge Traffic	555879.9	4184048.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
350	BT301	Barge Traffic	555829.9	4184049.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
351	BT302	Barge Traffic	555779.9	4184051.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
352	BT303	Barge Traffic	555730	4184053.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
353	BT304	Barge Traffic	555680	4184054.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
354	BT305	Barge Traffic	555630	4184056.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
355	BT306	Barge Traffic	555589	4184081.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
356	BT307	Barge Traffic	555550.1	4184113.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
357	BT308	Barge Traffic	555511.2	4184144.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
358	BT309	Barge Traffic	555472.3	4184176.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
359	BT310	Barge Traffic	555433.4	4184207.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
360	BT311	Barge Traffic	555394.5	4184239.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
361	BT312	Barge Traffic	555355.7	4184270.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
362	BT313	Barge Traffic	555316.8	4184301.9	0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
363	BT314	Barge Traffic	555277.9	4184333.3	0.03	1.29E-03	2.36E-06	15.20	23.26	3.53
364	BT315	Barge Traffic	555239	4184364.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
365	BT316	Barge Traffic	555200.1	4184396.2	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
366	BT317	Barge Traffic	555161.2	4184427.6	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
367	BT318	Barge Traffic	555122.3	4184459.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
368	BT319	Barge Traffic	555083.4	4184490.5	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
369	BT320	Barge Traffic	555044.6	4184521.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
370	BT321	Barge Traffic	555005.7	4184553.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
371	BT322	Barge Traffic	554966.8	4184584.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
372	BT323	Barge Traffic	554927.9	4184616.2	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
373	BT324	Barge Traffic	554889	4184647.6	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
374	BT325	Barge Traffic	554850.1	4184679.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
375	BT326	Barge Traffic	554811.2	4184710.5	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
376	BT327	Barge Traffic	554772.3	4184741.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
377	BT328	Barge Traffic	554733.5	4184773.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
378	BT329	Barge Traffic	554694.6	4184804.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
379	BT330	Barge Traffic	554655.7	4184836.2	0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
380	BT331	Barge Traffic	554616.8	4184867.6	0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
381	BT332	Barge Traffic	554577.9	4184899.1	0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
382	BT333	Barge Traffic	554539	4184930.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
383	BT334	Barge Traffic	554500.1	4184961.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
384	BT335	Barge Traffic	554461.2	4184993.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
385	BT336	Barge Traffic	554422.4	4185024.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
386	BT337	Barge Traffic	554383.5	4185056.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
387	BT338	Barge Traffic	554344.6	4185087.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
388	BT339	Barge Traffic	554305.7	4185119.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
389	BT340	Barge Traffic	554266.8	4185150.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
390	BT341	Barge Traffic	554227.9	4185181.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
391	BT342	Barge Traffic	554189	4185213.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
392	BT343	Barge Traffic	554150.1	4185244.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
393	BT344	Barge Traffic	554111.3	4185276.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
394	BT345	Barge Traffic	554072.4	4185307.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
395	BT346	Barge Traffic	554033.5	4185339.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
396	BT347	Barge Traffic	553994.6	4185370.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
397	BT348	Barge Traffic	553955.7	4185401.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
398	BT349	Barge Traffic	553916.8	4185433.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
399	BT350	Barge Traffic	553877.9	4185464.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
400	BT351	Barge Traffic	553839	4185496.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
401	BT352	Barge Traffic	553800.2	4185527.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
402	BT353	Barge Traffic	553761.3	4185559.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
403	BT354	Barge Traffic	553722.4	4185590.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
404	BT355	Barge Traffic	553683.5	4185621.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
405	BT356	Barge Traffic	553644.6	4185653.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
406	BT357	Barge Traffic	553605.7	4185684.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
407	BT358	Barge Traffic	553566.8	4185716.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
408	BT359	Barge Traffic	553527.9	4185747.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
409	BT360	Barge Traffic	553489.1	4185779.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
410	BT361	Barge Traffic	553450.2	4185810.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
411	BT362	Barge Traffic	553411.3	4185841.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
412	BT363	Barge Traffic	553372.4	4185873.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
413	BT364	Barge Traffic	553333.5	4185904.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
414	BT365	Barge Traffic	553294.6	4185936.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
415	BT366	Barge Traffic	553255.7	4185967.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
416	BT367	Barge Traffic	553216.8	4185999.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
417	BT368	Barge Traffic	553178	4186030.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
418	BT369	Barge Traffic	553139.1	4186061.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
419	BT370	Barge Traffic	553100.2	4186093.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
420	BT371	Barge Traffic	553061.3	4186124.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
421	BT372	Barge Traffic	553022.4	4186156.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
422	BT373	Barge Traffic	552983.5	4186187.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
423	BT374	Barge Traffic	552944.6	4186219.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
424	BT375	Barge Traffic	552905.7	4186250.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
425	BT376	Barge Traffic	552866.9	4186281.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
426	BT377	Barge Traffic	552828	4186313.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
427	BT378	Barge Traffic	552789.1	4186344.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
428	BT379	Barge Traffic	552750.2	4186376.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
429	BT380	Barge Traffic	552711.3	4186407.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
430	BT381	Barge Traffic	552672.4	4186439.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
431	BT382	Barge Traffic	552633.5	4186470.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
432	BT383	Barge Traffic	552594.6	4186501.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
433	BT384	Barge Traffic	552555.8	4186533.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
434	BT385	Barge Traffic	552516.9	4186564.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
435	BT386	Barge Traffic	552478	4186596.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
436	BT387	Barge Traffic	552439.1	4186627.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
437	BT388	Barge Traffic	552400.2	4186659.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
438	BT389	Barge Traffic	552361.3	4186690.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
439	BT390	Barge Traffic	552322.4	4186721.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
440	BT391	Barge Traffic	552283.5	4186753.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
441	BT392	Barge Traffic	552244.7	4186784.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
442	BT393	Barge Traffic	552205.8	4186816.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
443	BT394	Barge Traffic	552166.9	4186847.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
444	BT395	Barge Traffic	552128	4186879.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
445	BT396	Barge Traffic	552089.1	4186910.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
446	BT397	Barge Traffic	552050.2	4186941.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
447	BT398	Barge Traffic	552011.3	4186973.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
448	BT399	Barge Traffic	551972.4	4187004.8	-0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
449	BT400	Barge Traffic	551933.6	4187036.2	-0.08	1.29E-03	2.36E-06	15.20	23.26	3.53
450	BT401	Barge Traffic	551894.7	4187067.6	-0.17	1.29E-03	2.36E-06	15.20	23.26	3.53
451	BT402	Barge Traffic	551855.8	4187099.1	-0.24	1.29E-03	2.36E-06	15.20	23.26	3.53
452	BT403	Barge Traffic	551816.9	4187130.5	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
453	BT404	Barge Traffic	551778	4187161.9	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
454	BT405	Barge Traffic	551739.1	4187193.4	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
455	BT406	Barge Traffic	551700.2	4187224.8	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
456	BT407	Barge Traffic	551661.3	4187256.2	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
457	BT408	Barge Traffic	551622.5	4187287.6	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
458	BT409	Barge Traffic	551583.6	4187319.1	-0.25	1.29E-03	2.36E-06	15.20	23.26	3.53
459	BT410	Barge Traffic	551544.7	4187350.5	-0.18	1.29E-03	2.36E-06	15.20	23.26	3.53
460	BT411	Barge Traffic	551505.8	4187381.9	-0.08	1.29E-03	2.36E-06	15.20	23.26	3.53
461	BT412	Barge Traffic	551466.9	4187413.4	-0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
462	BT413	Barge Traffic	551428	4187444.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
463	BT414	Barge Traffic	551389.1	4187476.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
464	BT415	Barge Traffic	551350.2	4187507.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
465	BT416	Barge Traffic	551311.4	4187539.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
466	BT417	Barge Traffic	551272.5	4187570.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
467	BT418	Barge Traffic	551233.6	4187601.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
468	BT419	Barge Traffic	551194.7	4187633.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
469	BT420	Barge Traffic	551155.8	4187664.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
470	BT421	Barge Traffic	551116.9	4187696.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
471	BT422	Barge Traffic	551078	4187727.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
472	BT423	Barge Traffic	551039.1	4187759.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
473	BT424	Barge Traffic	551000.3	4187790.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
474	BT425	Barge Traffic	550961.4	4187821.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
475	BT426	Barge Traffic	550922.5	4187853.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
476	BT427	Barge Traffic	550883.6	4187884.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
477	BT428	Barge Traffic	550844.7	4187916.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
478	BT429	Barge Traffic	550805.8	4187947.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
479	BT430	Barge Traffic	550766.9	4187979.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
480	BT431	Barge Traffic	550724.8	4188005.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
481	BT432	Barge Traffic	550681.1	4188030	0	1.29E-03	2.36E-06	15.20	23.26	3.53
482	BT433	Barge Traffic	550637.4	4188054.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
483	BT434	Barge Traffic	550593.7	4188078.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
484	BT435	Barge Traffic	550550	4188102.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
485	BT436	Barge Traffic	550506.3	4188127.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
486	BT437	Barge Traffic	550462.6	4188151.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
487	BT438	Barge Traffic	550418.9	4188175.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
488	BT439	Barge Traffic	550375.2	4188200	0	1.29E-03	2.36E-06	15.20	23.26	3.53
489	BT440	Barge Traffic	550331.5	4188224.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
490	BT441	Barge Traffic	550287.8	4188248.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
491	BT442	Barge Traffic	550244.1	4188272.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
492	BT443	Barge Traffic	550200.3	4188297.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
493	BT444	Barge Traffic	550156.6	4188321.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
494	BT445	Barge Traffic	550112.9	4188345.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
495	BT446	Barge Traffic	550069.2	4188370	0	1.29E-03	2.36E-06	15.20	23.26	3.53
496	BT447	Barge Traffic	550025.5	4188394.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
497	BT448	Barge Traffic	549981.8	4188418.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
498	BT449	Barge Traffic	549938.1	4188442.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
499	BT450	Barge Traffic	549894.4	4188467.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
500	BT451	Barge Traffic	549850.7	4188491.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
501	BT452	Barge Traffic	549807	4188515.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
502	BT453	Barge Traffic	549763.3	4188540	0	1.29E-03	2.36E-06	15.20	23.26	3.53
503	BT454	Barge Traffic	549719.6	4188564.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
504	BT455	Barge Traffic	549672.3	4188567.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
505	BT456	Barge Traffic	549623.1	4188558.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
506	BT457	Barge Traffic	549573.9	4188549.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
507	BT458	Barge Traffic	549524.7	4188540.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
508	BT459	Barge Traffic	549475.5	4188531.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
509	BT460	Barge Traffic	549426.3	4188522.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
510	BT461	Barge Traffic	549377.1	4188513.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
511	BT462	Barge Traffic	549327.9	4188505	0	1.29E-03	2.36E-06	15.20	23.26	3.53
512	BT463	Barge Traffic	549278.7	4188496.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
513	BT464	Barge Traffic	549229.5	4188487.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
514	BT465	Barge Traffic	549180.3	4188478.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
515	BT466	Barge Traffic	549131.1	4188469.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
516	BT467	Barge Traffic	549081.9	4188460.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
517	BT468	Barge Traffic	549032.7	4188451.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
518	BT469	Barge Traffic	548983.5	4188442.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
519	BT470	Barge Traffic	548934.2	4188433.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
520	BT471	Barge Traffic	548885	4188425.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
521	BT472	Barge Traffic	548835.8	4188416.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
522	BT473	Barge Traffic	548786.6	4188407.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
523	BT474	Barge Traffic	548737.4	4188398.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
524	BT475	Barge Traffic	548688.2	4188389.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
525	BT476	Barge Traffic	548639	4188380.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
526	BT477	Barge Traffic	548589.8	4188371.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
527	BT478	Barge Traffic	548540.6	4188362.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
528	BT479	Barge Traffic	548492.4	4188350.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
529	BT480	Barge Traffic	548446.9	4188330	0	1.29E-03	2.36E-06	15.20	23.26	3.53
530	BT481	Barge Traffic	548401.5	4188309.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
531	BT482	Barge Traffic	548356.1	4188288.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
532	BT483	Barge Traffic	548310.6	4188267.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
533	BT484	Barge Traffic	548265.2	4188246.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
534	BT485	Barge Traffic	548219.8	4188225.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
535	BT486	Barge Traffic	548174.3	4188204.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
536	BT487	Barge Traffic	548128.9	4188183.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
537	BT488	Barge Traffic	548083.5	4188163	0	1.29E-03	2.36E-06	15.20	23.26	3.53
538	BT489	Barge Traffic	548038	4188142.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
539	BT490	Barge Traffic	547992.6	4188121.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
540	BT491	Barge Traffic	547947.2	4188100.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
541	BT492	Barge Traffic	547901.7	4188079.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
542	BT493	Barge Traffic	547921.1	4188080	0	1.29E-03	2.36E-06	15.20	23.26	3.53
543	BT494	Barge Traffic	547970.1	4188090.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
544	BT495	Barge Traffic	548019	4188100.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
545	BT496	Barge Traffic	548068	4188110.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
546	BT497	Barge Traffic	548116.9	4188120.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
547	BT498	Barge Traffic	548165.9	4188130.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
548	BT499	Barge Traffic	548214.8	4188141	0	1.29E-03	2.36E-06	15.20	23.26	3.53
549	BT500	Barge Traffic	548263.8	4188151.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
550	BT501	Barge Traffic	548312.7	4188161.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
551	BT502	Barge Traffic	548361.7	4188171.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
552	BT503	Barge Traffic	548410.6	4188181.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
553	BT504	Barge Traffic	548459.6	4188191.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
554	BT505	Barge Traffic	548508.6	4188202.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
555	BT506	Barge Traffic	548557.5	4188212.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
556	BT507	Barge Traffic	548606.5	4188222.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
557	BT508	Barge Traffic	548655.4	4188232.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
558	BT509	Barge Traffic	548704.4	4188242.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
559	BT510	Barge Traffic	548753.3	4188253	0	1.29E-03	2.36E-06	15.20	23.26	3.53
560	BT511	Barge Traffic	548802.3	4188263.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
561	BT512	Barge Traffic	548851.2	4188273.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
562	BT513	Barge Traffic	548900.2	4188283.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
563	BT514	Barge Traffic	548949.1	4188293.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
564	BT515	Barge Traffic	548998.1	4188303.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
565	BT516	Barge Traffic	549047	4188314	0	1.29E-03	2.36E-06	15.20	23.26	3.53
566	BT517	Barge Traffic	549096	4188324.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
567	BT518	Barge Traffic	549145	4188334.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
568	BT519	Barge Traffic	549193.9	4188344.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
569	BT520	Barge Traffic	549242.9	4188354.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
570	BT521	Barge Traffic	549291.8	4188364.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
571	BT522	Barge Traffic	549340.8	4188375.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
572	BT523	Barge Traffic	549389.7	4188385.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
573	BT524	Barge Traffic	549438.7	4188395.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
574	BT525	Barge Traffic	549487.6	4188405.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
575	BT526	Barge Traffic	549536.6	4188415.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
576	BT527	Barge Traffic	549583.6	4188415	0	1.29E-03	2.36E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
577	BT528	Barge Traffic	549626.3	4188389	0	1.29E-03	2.36E-06	15.20	23.26	3.53
578	BT529	Barge Traffic	549669	4188363	0	1.29E-03	2.36E-06	15.20	23.26	3.53
579	BT530	Barge Traffic	549711.7	4188337	0	1.29E-03	2.36E-06	15.20	23.26	3.53
580	BT531	Barge Traffic	549754.4	4188311	0	1.29E-03	2.36E-06	15.20	23.26	3.53
581	BT532	Barge Traffic	549797.1	4188285	0	1.29E-03	2.36E-06	15.20	23.26	3.53
582	BT533	Barge Traffic	549839.8	4188259	0	1.29E-03	2.36E-06	15.20	23.26	3.53
583	BT534	Barge Traffic	549882.5	4188232.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
584	BT535	Barge Traffic	549925.2	4188206.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
585	BT536	Barge Traffic	549968	4188180.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
586	BT537	Barge Traffic	550010.7	4188154.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
587	BT538	Barge Traffic	550053.4	4188128.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
588	BT539	Barge Traffic	550096.1	4188102.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
589	BT540	Barge Traffic	550138.8	4188076.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
590	BT541	Barge Traffic	550181.5	4188050.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
591	BT542	Barge Traffic	550224.2	4188024.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
592	BT543	Barge Traffic	550266.9	4187998.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
593	BT544	Barge Traffic	550309.6	4187972.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
594	BT545	Barge Traffic	550352.3	4187946.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
595	BT546	Barge Traffic	550395	4187920.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
596	BT547	Barge Traffic	550437.7	4187894.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
597	BT548	Barge Traffic	550480.4	4187868.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
598	BT549	Barge Traffic	550523.1	4187842.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
599	BT550	Barge Traffic	550565.8	4187816.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
600	BT551	Barge Traffic	550608.5	4187790.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
601	BT552	Barge Traffic	550651.2	4187764.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
602	BT553	Barge Traffic	550693.9	4187738.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
603	BT554	Barge Traffic	550736.6	4187712.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
604	BT555	Barge Traffic	550779.3	4187686.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
605	BT556	Barge Traffic	550822	4187660.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
606	BT557	Barge Traffic	550864.7	4187634.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
607	BT558	Barge Traffic	550907.4	4187608.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
608	BT559	Barge Traffic	550950.1	4187582.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
609	BT560	Barge Traffic	550992.8	4187556.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
610	BT561	Barge Traffic	551032.4	4187526.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
611	BT562	Barge Traffic	551066.2	4187490	0	1.29E-03	2.36E-06	15.20	23.26	3.53
612	BT563	Barge Traffic	551099.9	4187453.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
613	BT564	Barge Traffic	551133.7	4187416.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
614	BT565	Barge Traffic	551167.5	4187379.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
615	BT566	Barge Traffic	551201.3	4187342.6	-0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
616	BT567	Barge Traffic	551235.1	4187305.7	-0.07	1.29E-03	2.36E-06	15.20	23.26	3.53
617	BT568	Barge Traffic	551268.9	4187268.8	-0.18	1.29E-03	2.36E-06	15.20	23.26	3.53
618	BT569	Barge Traffic	551302.7	4187232	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
619	BT570	Barge Traffic	551336.4	4187195.1	-0.29	1.29E-03	2.36E-06	15.20	23.26	3.53
620	BT571	Barge Traffic	551370.2	4187158.3	-0.29	1.29E-03	2.36E-06	15.20	23.26	3.53
621	BT572	Barge Traffic	551404	4187121.4	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
622	BT573	Barge Traffic	551437.8	4187084.5	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
623	BT574	Barge Traffic	551471.6	4187047.7	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
624	BT575	Barge Traffic	551505.4	4187010.8	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
625	BT576	Barge Traffic	551539.2	4186974	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
626	BT577	Barge Traffic	551572.9	4186937.1	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
627	BT578	Barge Traffic	551606.7	4186900.3	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
628	BT579	Barge Traffic	551640.5	4186863.4	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
629	BT580	Barge Traffic	551674.3	4186826.5	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
630	BT581	Barge Traffic	551708.1	4186789.7	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
631	BT582	Barge Traffic	551741.9	4186752.8	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
632	BT583	Barge Traffic	551771.9	4186713	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
633	BT584	Barge Traffic	551799.9	4186671.6	-0.27	1.29E-03	2.36E-06	15.20	23.26	3.53
634	BT585	Barge Traffic	551827.8	4186630.1	-0.26	1.29E-03	2.36E-06	15.20	23.26	3.53
635	BT586	Barge Traffic	551855.8	4186588.7	-0.26	1.29E-03	2.36E-06	15.20	23.26	3.53
636	BT587	Barge Traffic	551883.8	4186547.2	-0.26	1.29E-03	2.36E-06	15.20	23.26	3.53
637	BT588	Barge Traffic	551911.7	4186505.8	-0.24	1.29E-03	2.36E-06	15.20	23.26	3.53
638	BT589	Barge Traffic	551939.7	4186464.3	-0.16	1.29E-03	2.36E-06	15.20	23.26	3.53
639	BT590	Barge Traffic	551967.6	4186422.9	-0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
640	BT591	Barge Traffic	551995.6	4186381.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
641	BT592	Barge Traffic	552023.6	4186340	0	1.29E-03	2.36E-06	15.20	23.26	3.53
642	BT593	Barge Traffic	552051.5	4186298.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
643	BT594	Barge Traffic	552079.5	4186257.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
644	BT595	Barge Traffic	552107.5	4186215.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
645	BT596	Barge Traffic	552135.4	4186174.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
646	BT597	Barge Traffic	552163.4	4186132.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
647	BT598	Barge Traffic	552191.3	4186091.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
648	BT599	Barge Traffic	552219.3	4186049.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53

Project Volume Sources

Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
649	BT600	Barge Traffic	552247.3	4186008.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
650	BT601	Barge Traffic	552275.2	4185966.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
651	BT602	Barge Traffic	552303.2	4185925.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
652	BT603	Barge Traffic	552331.1	4185884	0	1.29E-03	2.36E-06	15.20	23.26	3.53
653	BT604	Barge Traffic	552359.1	4185842.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
654	BT605	Barge Traffic	552387.1	4185801.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
655	BT606	Barge Traffic	552415	4185759.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
656	BT607	Barge Traffic	552443	4185718.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
657	BT608	Barge Traffic	552471	4185676.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
658	BT609	Barge Traffic	552498.9	4185635.3	-0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
659	BT610	Barge Traffic	552526.9	4185593.9	-0.08	1.29E-03	2.36E-06	15.20	23.26	3.53
660	BT611	Barge Traffic	552554.8	4185552.4	-0.15	1.29E-03	2.36E-06	15.20	23.26	3.53
661	BT612	Barge Traffic	552582.8	4185511	-0.17	1.29E-03	2.36E-06	15.20	23.26	3.53
662	BT613	Barge Traffic	552610.8	4185469.5	-0.17	1.29E-03	2.36E-06	15.20	23.26	3.53
663	BT614	Barge Traffic	552638.7	4185428.1	-0.17	1.29E-03	2.36E-06	15.20	23.26	3.53
664	BT615	Barge Traffic	552666.7	4185386.6	-0.16	1.29E-03	2.36E-06	15.20	23.26	3.53
665	BT616	Barge Traffic	552694.7	4185345.2	-0.16	1.29E-03	2.36E-06	15.20	23.26	3.53
666	BT617	Barge Traffic	552722.6	4185303.7	-0.16	1.29E-03	2.36E-06	15.20	23.26	3.53
667	BT618	Barge Traffic	552750.6	4185262.3	-0.12	1.29E-03	2.36E-06	15.20	23.26	3.53
668	BT619	Barge Traffic	552778.5	4185220.8	-0.09	1.29E-03	2.36E-06	15.20	23.26	3.53
669	BT620	Barge Traffic	552806.5	4185179.4	-0.07	1.29E-03	2.36E-06	15.20	23.26	3.53
670	BT621	Barge Traffic	552834.5	4185137.9	-0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
671	BT622	Barge Traffic	552862.4	4185096.5	-0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
672	BT623	Barge Traffic	552890.4	4185055	-0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
673	BT624	Barge Traffic	552918.4	4185013.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
674	BT625	Barge Traffic	552946.3	4184972.1	0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
675	BT626	Barge Traffic	552974.3	4184930.6	0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
676	BT627	Barge Traffic	553002.2	4184889.2	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
677	BT628	Barge Traffic	553030.2	4184847.7	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
678	BT629	Barge Traffic	553058.2	4184806.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
679	BT630	Barge Traffic	553086.1	4184764.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
680	BT631	Barge Traffic	553114.1	4184723.4	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
681	BT632	Barge Traffic	553142.1	4184681.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
682	BT633	Barge Traffic	553170	4184640.5	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
683	BT634	Barge Traffic	553198	4184599	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
684	BT635	Barge Traffic	553225.9	4184557.6	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
685	BT636	Barge Traffic	553253.9	4184516.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
686	BT637	Barge Traffic	553281.9	4184474.7	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
687	BT638	Barge Traffic	553309.8	4184433.2	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
688	BT639	Barge Traffic	553337.8	4184391.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
689	BT640	Barge Traffic	553365.7	4184350.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
690	BT641	Barge Traffic	553393.7	4184308.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
691	BT642	Barge Traffic	553421.7	4184267.4	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
692	BT643	Barge Traffic	553449.6	4184226	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
693	BT644	Barge Traffic	553477.6	4184184.5	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
694	BT645	Barge Traffic	553505.6	4184143.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
695	BT646	Barge Traffic	553533.5	4184101.6	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
696	BT647	Barge Traffic	553561.5	4184060.2	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
697	BT648	Barge Traffic	553589.4	4184018.7	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
698	BT649	Barge Traffic	553617.4	4183977.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
699	BT650	Barge Traffic	553645.4	4183935.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
700	BT651	Barge Traffic	553673.3	4183894.4	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
701	BT652	Barge Traffic	553701.3	4183852.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
702	BT653	Barge Traffic	553729.3	4183811.5	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
703	BT654	Barge Traffic	553757.2	4183770	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
704	BT655	Barge Traffic	553785.2	4183728.6	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
705	BT656	Barge Traffic	553813.1	4183687.1	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
706	BT657	Barge Traffic	553841.1	4183645.7	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
707	BT658	Barge Traffic	553869.1	4183604.2	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
708	BT659	Barge Traffic	553897	4183562.8	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
709	BT660	Barge Traffic	553925	4183521.3	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
710	BT661	Barge Traffic	553953	4183479.9	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
711	BT662	Barge Traffic	553980.9	4183438.4	0.05	1.29E-03	2.36E-06	15.20	23.26	3.53
712	BT663	Barge Traffic	554008.9	4183397	0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
713	BT664	Barge Traffic	554036.8	4183355.5	0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
714	BT665	Barge Traffic	554064.8	4183314.1	0.03	1.29E-03	2.36E-06	15.20	23.26	3.53
715	BT666	Barge Traffic	554092.8	4183272.6	0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
716	BT667	Barge Traffic	554120.7	4183231.2	0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
717	BT668	Barge Traffic	554148.7	4183189.7	0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
718	BT669	Barge Traffic	554176.7	4183148.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
719	BT670	Barge Traffic	554204.6	4183106.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
720	BT671	Barge Traffic	554232.6	4183065.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53

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Index	ID	Description	X coord	Y coord	Elevation	HRA Emission rate	$PM_{2.5}$ Emission Rate	Release Height	Init. Lat. Dim	Init. Vert. Dim
			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
721	BT672	Barge Traffic	554260.5	4183023.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
722	BT673	Barge Traffic	554288.5	4182982.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
723	BT674	Barge Traffic	554316.5	4182941	0	1.29E-03	2.36E-06	15.20	23.26	3.53
724	BT675	Barge Traffic	554344.4	4182899.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
725	BT676	Barge Traffic	554372.4	4182858.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
726	BT677	Barge Traffic	554400.3	4182816.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
727	BT678	Barge Traffic	554428.3	4182775.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
728	BT679	Barge Traffic	554456.3	4182733.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
729	BT680	Barge Traffic	554484.2	4182692.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
730	BT681	Barge Traffic	554512.2	4182650.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
731	BT682	Barge Traffic	554540.2	4182609.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
732	BT683	Barge Traffic	554568.1	4182568	0	1.29E-03	2.36E-06	15.20	23.26	3.53
733	BT684	Barge Traffic	554589	4182523.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
734	BT685	Barge Traffic	554595	4182474.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
735	BT686	Barge Traffic	554601	4182424.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
736	BT687	Barge Traffic	554607.1	4182375	0	1.29E-03	2.36E-06	15.20	23.26	3.53
737	BT688	Barge Traffic	554613.1	4182325.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
738	BT689	Barge Traffic	554619.2	4182275.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
739	BT690	Barge Traffic	554625.2	4182226.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
740	BT691	Barge Traffic	554631.2	4182176.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
741	BT692	Barge Traffic	554637.3	4182126.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
742	BT693	Barge Traffic	554643.3	4182077.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
743	BT694	Barge Traffic	554649.4	4182027.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
744	BT695	Barge Traffic	554655.4	4181977.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
745	BT696	Barge Traffic	554661.4	4181928.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
746	BT697	Barge Traffic	554667.5	4181878.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
747	BT698	Barge Traffic	554673.5	4181829	0	1.29E-03	2.36E-06	15.20	23.26	3.53
748	BT699	Barge Traffic	554679.5	4181779.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
749	BT700	Barge Traffic	554685.6	4181729.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
750	BT701	Barge Traffic	554691.6	4181680.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
751	BT702	Barge Traffic	554697.7	4181630.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
752	BT703	Barge Traffic	554703.7	4181580.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
753	BT704	Barge Traffic	554709.7	4181531.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
754	BT705	Barge Traffic	554715.8	4181481.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
755	BT706	Barge Traffic	554721.8	4181431.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
756	BT707	Barge Traffic	554727.9	4181382.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
757	BT708	Barge Traffic	554733.9	4181332.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
758	BT709	Barge Traffic	554739.9	4181283	0	1.29E-03	2.36E-06	15.20	23.26	3.53
759	BT710	Barge Traffic	554746	4181233.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
760	BT711	Barge Traffic	554752	4181183.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
761	BT712	Barge Traffic	554758.1	4181134.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
762	BT713	Barge Traffic	554764.1	4181084.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
763	BT714	Barge Traffic	554770.1	4181034.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
764	BT715	Barge Traffic	554776.2	4180985.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
765	BT716	Barge Traffic	554782.2	4180935.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
766	BT717	Barge Traffic	554788.3	4180886	0	1.29E-03	2.36E-06	15.20	23.26	3.53
767	BT718	Barge Traffic	554794.3	4180836.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
768	BT719	Barge Traffic	554800.3	4180786.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
769	BT720	Barge Traffic	554806.4	4180737.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
770	BT721	Barge Traffic	554812.4	4180687.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
771	BT722	Barge Traffic	554818.5	4180637.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
772	BT723	Barge Traffic	554824.5	4180588.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
773	BT724	Barge Traffic	554830.5	4180538.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
774	BT725	Barge Traffic	554836.6	4180488.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
775	BT726	Barge Traffic	554842.6	4180439.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
776	BT727	Barge Traffic	554848.6	4180389.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
777	BT728	Barge Traffic	554854.7	4180340	0	1.29E-03	2.36E-06	15.20	23.26	3.53
778	BT729	Barge Traffic	554860.7	4180290.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
779	BT730	Barge Traffic	554866.8	4180240.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
780	BT731	Barge Traffic	554872.8	4180191.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
781	BT732	Barge Traffic	554878.8	4180141.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
782	BT733	Barge Traffic	554884.9	4180091.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
783	BT734	Barge Traffic	554890.9	4180042.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
784	BT735	Barge Traffic	554897	4179992.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
785	BT736	Barge Traffic	554903	4179942.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
786	BT737	Barge Traffic	554909	4179893.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
787	BT738	Barge Traffic	554915.1	4179843.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
788	BT739	Barge Traffic	554921.1	4179794	0	1.29E-03	2.36E-06	15.20	23.26	3.53
789	BT740	Barge Traffic	554927.2	4179744.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
790	BT741	Barge Traffic	554933.2	4179694.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
791	BT742	Barge Traffic	554939.2	4179645.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
792	BT743	Barge Traffic	554945.3	4179595.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53

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			(m)	(m)	(m)	(g/s)	(g/s)	(m)	(m)	(m)
793	BT744	Barge Traffic	554951.3	4179545.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
794	BT745	Barge Traffic	554957.4	4179496.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
795	BT746	Barge Traffic	554963.4	4179446.6	-0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
796	BT747	Barge Traffic	554969.4	4179396.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
797	BT748	Barge Traffic	554975.5	4179347.3	-0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
798	BT749	Barge Traffic	554981.5	4179297.7	-0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
799	BT750	Barge Traffic	554987.5	4179248	-0.04	1.29E-03	2.36E-06	15.20	23.26	3.53
800	BT751	Barge Traffic	554993.6	4179198.4	-0.03	1.29E-03	2.36E-06	15.20	23.26	3.53
801	BT752	Barge Traffic	554999.6	4179148.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
802	BT753	Barge Traffic	555005.7	4179099.1	0	1.29E-03	2.36E-06	15.20	23.26	3.53
803	BT754	Barge Traffic	555011.7	4179049.5	-0.17	1.29E-03	2.36E-06	15.20	23.26	3.53
804	BT755	Barge Traffic	555017.7	4178999.9	-0.28	1.29E-03	2.36E-06	15.20	23.26	3.53
805	BT756	Barge Traffic	555023.8	4178950.2	-0.03	1.29E-03	2.36E-06	15.20	23.26	3.53
806	BT757	Barge Traffic	555029.8	4178900.6	0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
807	BT758	Barge Traffic	555035.9	4178851	0.07	1.29E-03	2.36E-06	15.20	23.26	3.53
808	BT759	Barge Traffic	555041.9	4178801.3	0	1.29E-03	2.36E-06	15.20	23.26	3.53
809	BT760	Barge Traffic	555047.9	4178751.7	-0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
810	BT761	Barge Traffic	555054	4178702.1	-0.02	1.29E-03	2.36E-06	15.20	23.26	3.53
811	BT762	Barge Traffic	555060	4178652.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
812	BT763	Barge Traffic	555066.1	4178602.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
813	BT764	Barge Traffic	555072.1	4178553.2	0	1.29E-03	2.36E-06	15.20	23.26	3.53
814	BT765	Barge Traffic	555078.1	4178503.5	0	1.29E-03	2.36E-06	15.20	23.26	3.53
815	BT766	Barge Traffic	555084.2	4178453.9	0	1.29E-03	2.36E-06	15.20	23.26	3.53
816	BT767	Barge Traffic	555090.2	4178404.3	-0.01	1.29E-03	2.36E-06	15.20	23.26	3.53
817	BT768	Barge Traffic	555096.3	4178354.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
818	BT769	Barge Traffic	555102.3	4178305	0	1.29E-03	2.36E-06	15.20	23.26	3.53
819	BT770	Barge Traffic	555108.3	4178255.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
820	BT771	Barge Traffic	555114.4	4178205.7	0	1.29E-03	2.36E-06	15.20	23.26	3.53
821	BT772	Barge Traffic	555119.6	4178156.4	0	1.29E-03	2.36E-06	15.20	23.26	3.53
822	BT773	Barge Traffic	555082.8	4178122.6	0	1.29E-03	2.36E-06	15.20	23.26	3.53
823	BT774	Barge Traffic	555045.9	4178088.8	0	1.29E-03	2.36E-06	15.20	23.26	3.53
824	BT775	Barge Traffic	555009	4178055	0	1.29E-03	2.36E-06	15.20	23.26	3.53
825	BT776	Barge Traffic	554972.2	4178021.3	-0.07	1.29E-03	2.36E-06	15.20	23.26	3.53
826	BT777	Barge Traffic	554935.3	4177987.5	0.18	1.29E-03	2.36E-06	15.20	23.26	3.53

Project Boundary

X coord	Y coord	Elevation	Hill height scale	Flagpole height
(m)	(m)	(m)	(m)	(m)
554809.5	4177786.4	5.78	11.23	1.8
554807.8	4177806.3	5.22	11.23	1.8
554806.1	4177826.3	5.35	10.62	1.8
554804.4	4177846.2	4.92	11.6	1.8
554802.7	4177866.1	3.94	11.87	1.8
554801	4177886	3.71	11.6	1.8
554800.6	4177890.5	3.54	11.6	1.8
554816	4177892	4.45	11.87	1.8
554836	4177893.9	3.93	11.87	1.8
554845.8	4177894.9	3.92	11.87	1.8
554844.9	4177905	3.42	11.87	1.8
554843.2	4177924.9	2.34	11.87	1.8
554841.4	4177944.8	1.53	11.87	1.8
554839.6	4177964.7	0.75	0.75	1.8
554839.4	4177967.4	0.67	0.67	1.8
554847.5	4177967.7	0.67	0.67	1.8
554848.3	4177958.5	0.99	0.99	1.8
554850	4177938.6	1.97	11.87	1.8
554850.6	4177931.3	2.29	11.87	1.8
554863.2	4177932.7	1.85	11.87	1.8
554865.9	4177933	1.81	11.87	1.8
554867.7	4177915.8	2.18	11.87	1.8
554869.6	4177897	3.47	11.87	1.8
554870.7	4177897.1	3.52	11.87	1.8
554890.7	4177898.2	3.88	11.87	1.8
554910.6	4177899.3	4.19	11.87	1.8
554917.9	4177899.7	4.35	11.87	1.8
554927.5	4177891.3	4.48	11.87	1.8
554929.5	4177889.5	4.55	11.87	1.8
554937.7	4177887.4	4.22	11.87	1.8
554938.7	4177878.6	4.27	11.87	1.8
554940.9	4177858.8	4.11	11.87	1.8
554943.2	4177838.9	5.22	6.39	1.8
554945.4	4177819	4.95	6.39	1.8
554947.7	4177799.1	5.96	5.96	1.8
554949.9	4177779.3	5.75	5.97	1.8
554949.9	4177779.3	5.75	5.97	1.8
554936	4177777.9	5.17	5.17	1.8
554936.2	4177771.8	5.15	5.15	1.8
554936.6	4177757.2	5.57	5.57	1.8
554931.3	4177756.8	5.7	5.7	1.8

Project Boundary

X coord	Y coord	Elevation	Hill height scale	Flagpole height
(m)	(m)	(m)	(m)	(m)
554911.3	4177755.2	5.85	5.85	1.8
554891.4	4177753.6	6.16	6.16	1.8
554871.5	4177752	6.45	6.45	1.8
554851.5	4177750.3	6.81	6.81	1.8
554831.6	4177748.7	6.7	6.7	1.8
554811.7	4177747.1	6.27	6.27	1.8
554797.5	4177746	6.19	6.19	1.8
554797	4177751.8	6.11	6.11	1.8
554795.1	4177771.7	6.04	6.04	1.8
554793.8	4177785.4	5.91	5.91	1.8
554800	4177785.8	5.61	5.61	1.8

```
** AERSURFACE Output File, Version 24142                          08/17/25 **
**                                                                10:28:00 **

CO STARTING
   TITLEONE  P92 AERSURFACE
   TITLETWO  2016 NLCD

** Using default options for OPTIONS keyword and parameters
   OPTIONS   PRIMARY  ZORAD

   DEBUGOPT  GRID  TIFF

   CENTERLL  37.746032 -122.377069   NAD83

   DATAFILE  NLCD2024  "Annual_NLCD_LndCov_2016.tiff"
   DATAFILE  CNPY2024  "nlcd_tcc_conus_wgs84_20160101_20161231.tiff"
   DATAFILE  MPRV2024  "Annual_NLCD_FctImp_2016.tiff"


   ZORADIUS  3.0

   CLIMATE   WET  NOSNOW   NONARID

   FREQ_SECT   MONTHLY    1  NONAP

**        index  start    end
   SECTOR   1    0.00   360.00


   RUNORNOT  RUN
CO FINISHED

OU STARTING
   SFCCHAR    "MMP92_2024_lc_can_imp_zorad_sfc.txt"
   NLCDGRID   "MMP92_2024_lc_can_imp_zorad_lc_grid.txt"
   CNPYGRID   "MMP92_2024_lc_can_imp_zorad_can_grid.txt"
   MPRVGRID   "MMP92_2024_lc_can_imp_zorad_imp_grid.txt"
OU FINISHED

*******************************************
*** AERSURFACE SETUP Finished Successfully ***
*******************************************


 WARNING: The NLCD file contains one or more land cover
 code in conflict with the NLCD version specified.
 These codes may represent missing data or data points
 outside of the data boundaries of the file.
 Please verify the version of the NLCD file:
 Annual_NLCD_LndCov_2016.tiff
```

```
 The land cover category will be set to missing.


 WARNING: The land cover values for   1.5% of
 the cells extracted to compute Bowen ratio and albedo
 are either missing, outside of the NLCD file boundary,
 or invalid.
 ********* Errors(E)/Warnings(W) ************

 PW      --- Pathway (if during Setup)
 Code    --- Error Type + Error Code
 L#      --- Line # (if during Setup)
 ModNam  --- Module/Procedure
 Message --- Hints For The Possible Solution
 ******************************************

PW CODE   L#  ModNam          MESSAGE
HINT
-- ---- ----- -------------- --------------------------------------------------
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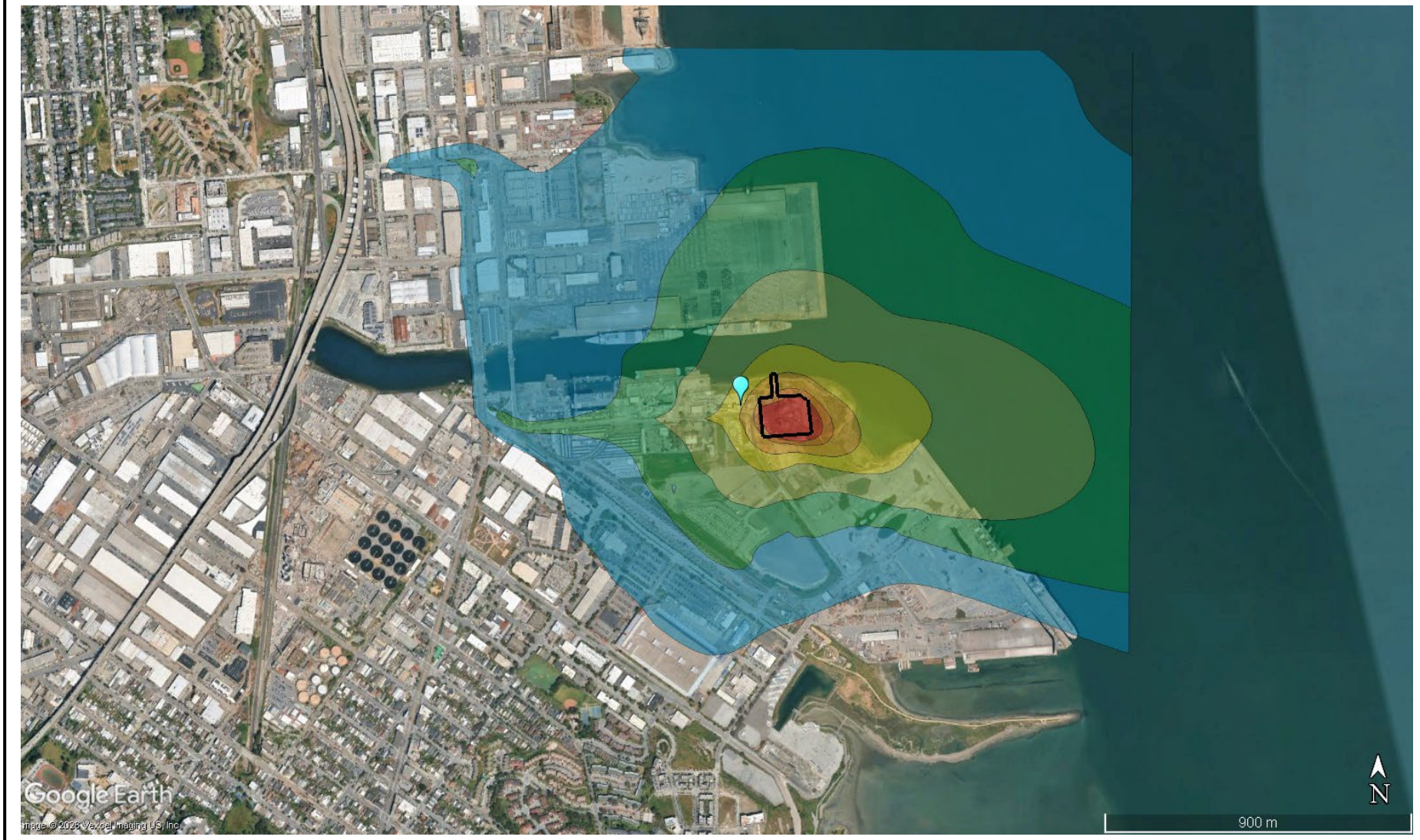
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NLCD2024
CO W297    13 DATAFILE        Check NLCD year based on years of data available
CNPY2024
CO W297    14 DATAFILE        Check NLCD year based on years of data available
MPRV2024

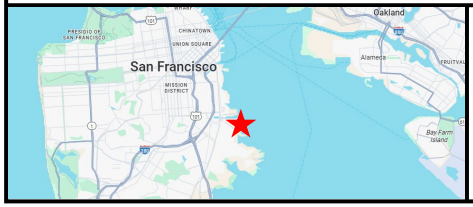
************************************************
*** AERSURFACE Processing Finished Successfully ***
************************************************
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AERSURFACE

Cat	Land Cover	Count	
0	Missing, Out-of-Bounds, or Unde:	0	0%
11	Open Water:	14655	47%
12	Perennial Ice/Snow:	0	0%
21	Developed, Open Space:	74	0%
22	Developed, Low Intensity:	616	2%
23	Developed, Medium Intensity:	6373	20%
24	Developed, High Intensity:	9623	31%
31	Barren Land (Rock/Sand/Clay):	14	0%
32	Unconsolidated Shore:	0	0%
41	Deciduous Forest:	0	0%
42	Evergreen Forest:	0	0%
43	Mixed Forest:	0	0%
51	Dwarf Scrub:	0	0%
52	Shrub/Scrub:	1	0%
71	Grasslands/Herbaceous:	56	0%
72	Sedge/Herbaceous:	0	0%
73	Lichens:	0	0%
74	Moss:	0	0%
81	Pasture/Hay:	0	0%
82	Cultivated Crops:	0	0%
90	Woody Wetlands:	0	0%
91	Palustrine Forested Wetland:	0	0%
92	Palustrine Scrub/Shrub Wetland:	0	0%
93	Estuarine Forested Wetland:	0	0%
94	Estuarine Scrub/Shrub Wetland:	0	0%
95	Emergent Herbaceous Wetland:	0	0%
96	Palustrine Emergent Wetland (Pe:	0	0%
97	Estuarine Emergent Wetland:	0	0%
98	Palustrine Aquatic Bed:	0	0%
99	Estuarine Aquatic Bed:	0	0%
	Total:	31412	
	Urban Determination:	Urban	

APPENDIX D. FIGURES





Legend

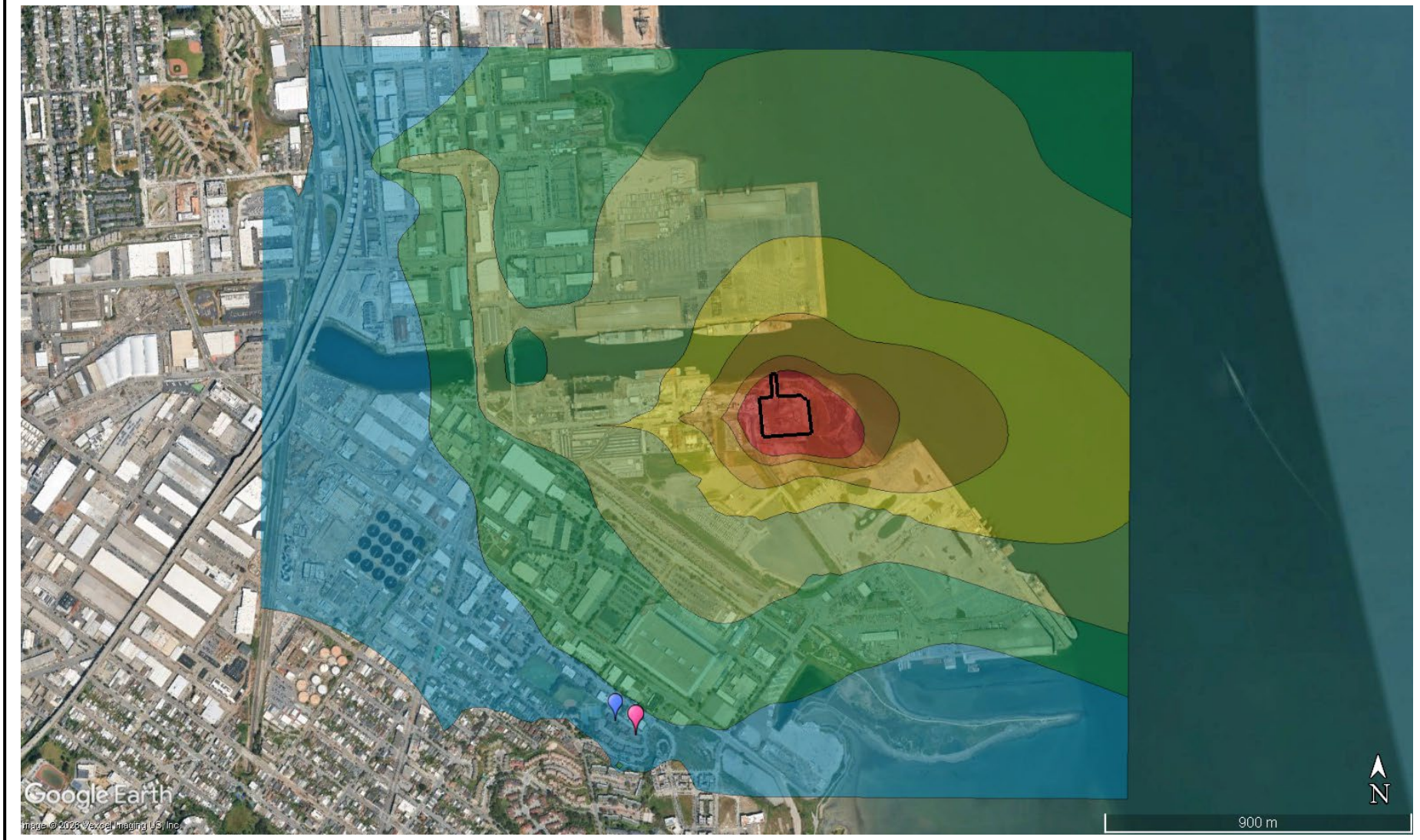
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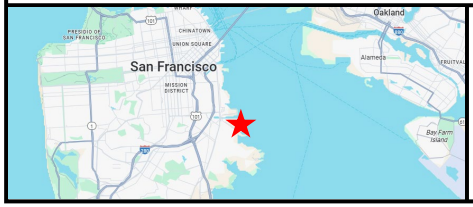
MEIW

Cancer Risk (per one million)

30 20 10 5 2 1 0.5

Figure D-1
Baseline Worker Cancer Risk





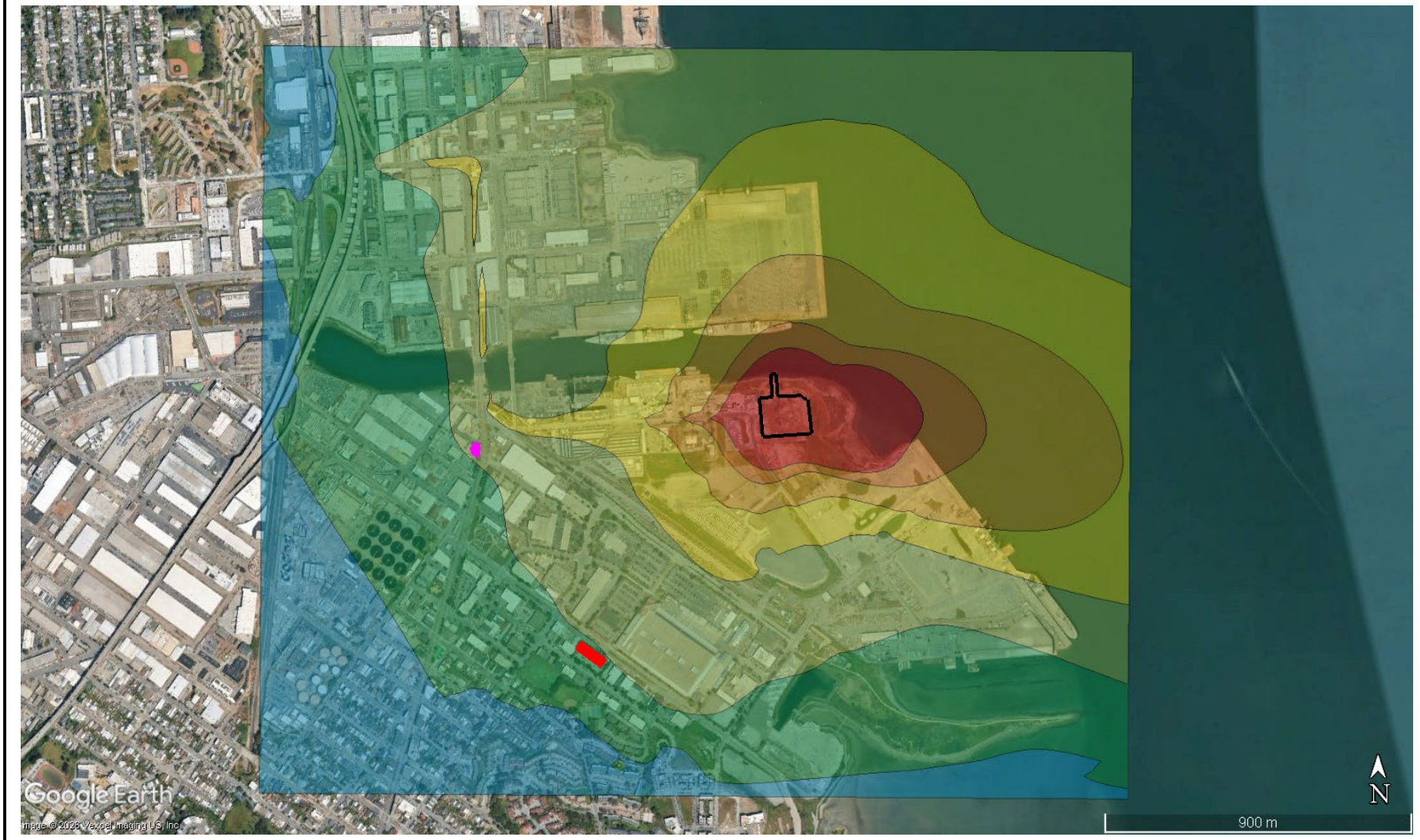
Legend

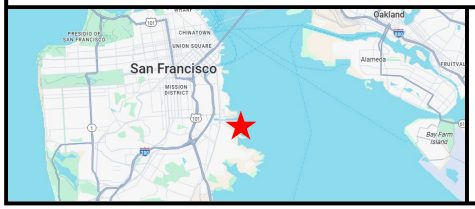
- Facility Boundary
- MEIR 1
- MEIR 2

Cancer Risk (per one million)

30 | 20 | 10 | 5 | 2 | 1 | 0.5

Figure D-2
Baseline Resident Cancer Risk





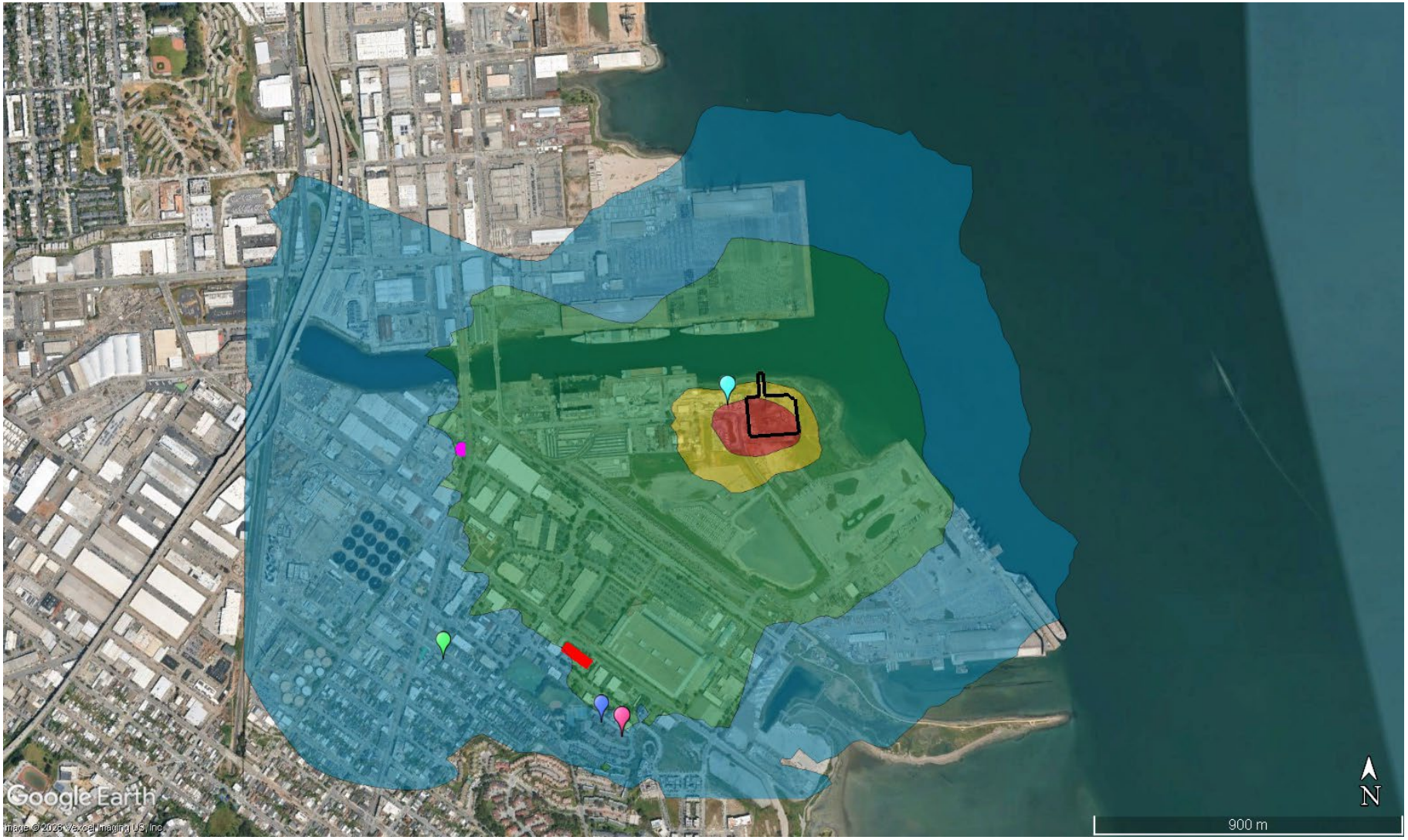
Legend

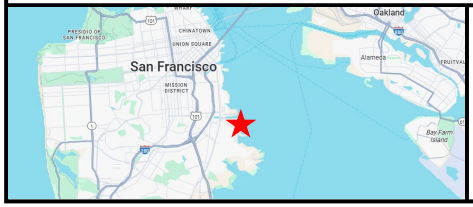
- Facility Boundary
- Healthcare Facility 1
- Healthcare Facility 2

Cancer Risk (per one million)

30 | 20 | 10 | 5 | 2 | 1 | 0.5

Figure D-3 Baseline Healthcare Patient Cancer Risk





Legend

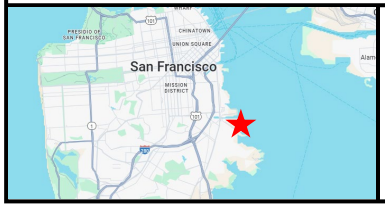
- Facility Boundary
- MEIR 1
- MEIR 2
- MEIW
- Daycare
- Healthcare Facility 1
- Healthcare Facility 2

Acute HI

0.01	0.005	0.001	0.0005

Figure D-4
Baseline Acute Hazard Index





Legend

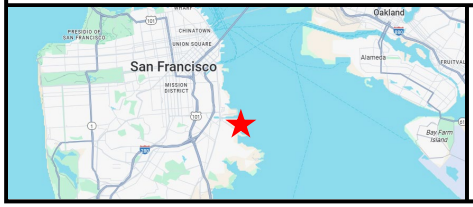
- Facility Boundary
- MEIR 1
- MEIR 2
- MEIW
- Daycare
- Healthcare Facility 1
- Healthcare Facility 2

Annual Average $PM_{2.5}$ Concentration (µg/m³)

0.5	0.1	0.05	0.01	0.005	0.001

Figure D-5
Baseline Annual Average $PM_{2.5}$ Concentration





Legend

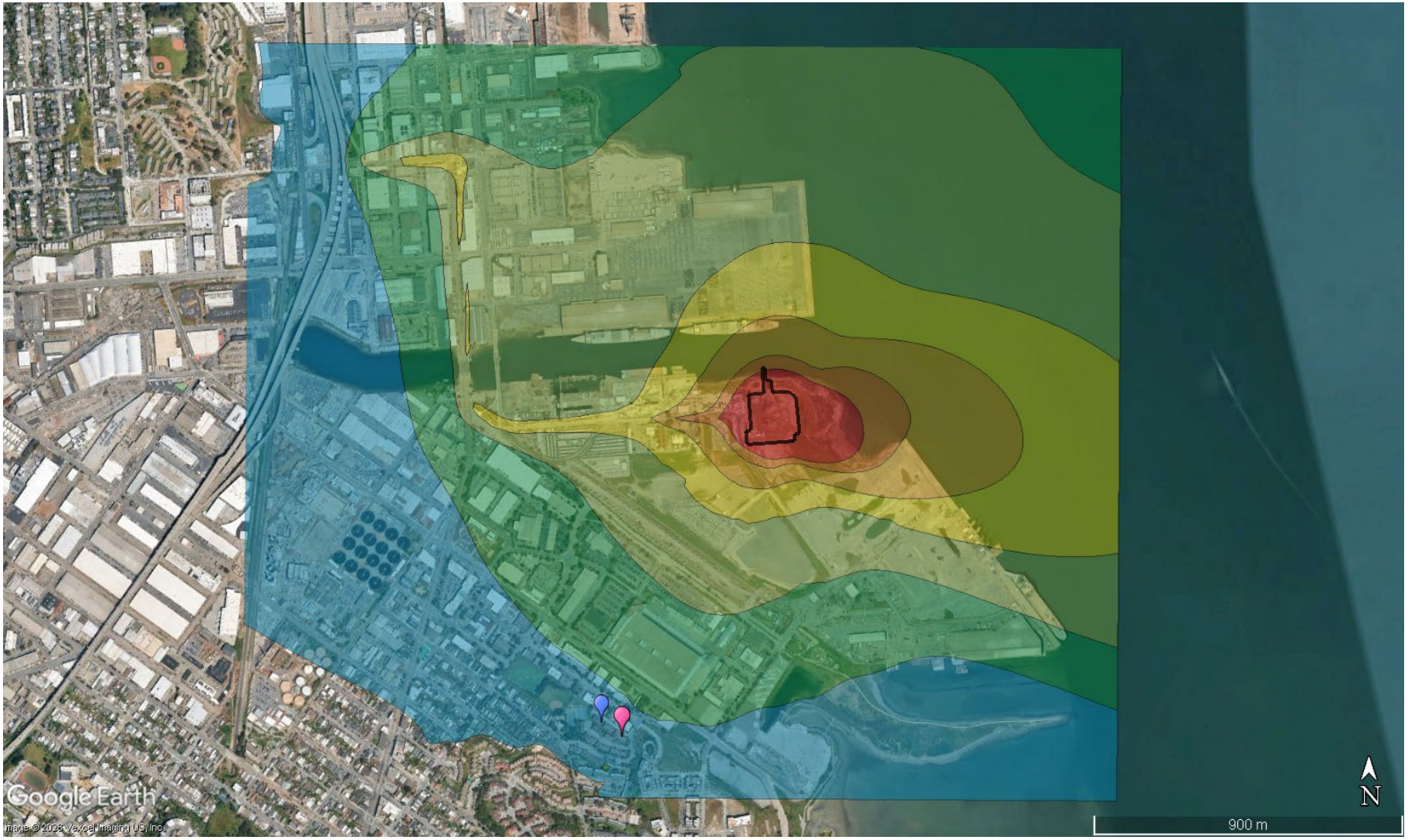
Facility Boundary

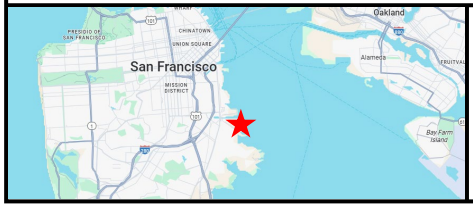
MEIW

Cancer Risk (per one million)

30 20 10 5 2 1 0.5

Figure D-6
Project Worker Cancer Risk





Legend

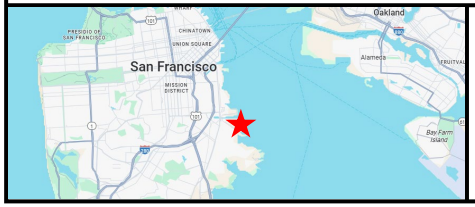
- Facility Boundary
- MEIR 1
- MEIR 2

Cancer Risk (per one million)

30 | 20 | 10 | 5 | 2 | 1 | 0.5

Figure D-7
Project Resident Cancer Risk





Legend

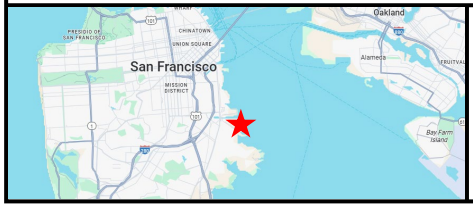
- Facility Boundary
- Healthcare Facility 1
- Healthcare Facility 2

Cancer Risk (per one million)

30 | 20 | 10 | 5 | 2 | 1 | 0.5

Figure D-8
Project Healthcare Patient Cancer Risk





Legend

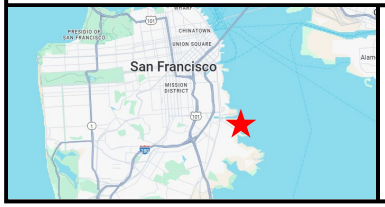
- Facility Boundary
- MEIR 1
- MEIR 2
- MEIW
- Daycare
- Healthcare Facility 1
- Healthcare Facility 2

Acute HI

0.01	0.005	0.001	0.0005

Figure D-9
Project Acute Hazard Index





Legend

- Facility Boundary
- MEIR 1
- MEIR 2
- MEIW
- Daycare
- Healthcare Facility 1
- Healthcare Facility 2

Annual Average $PM_{2.5}$ Concentration ($\mu g/m^3$)

0.5 | 0.1 | 0.05 | 0.01 | 0.005 | 0.001

Figure D-10
Project Annual Average $PM_{2.5}$ Concentration

APPENDIX E. DETAILED RESULTS

Table 1. Worker and Resident Receptors Results

Scenario	Receptor Type	Address Associated Receptor Type	Receptor ID	UTM Easting (m)	UTM Northing (m)	Maximum Cancer Risk (per million)	Maximum Chronic HI	Maximum Acute HI	$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)
Construction	Worker	Central Concrete Supply	5259	554740	4177860	0.0039	0.0002		0.00883
	Resident	11 Bowman Ct	433	554440	4176900	0.0027	4.88E-06		0.00021
		41 Bowman Ct	632	554380	4176940	-	-		0.00021
Construction Worker Trips						0.02			0.0005
Project	Worker	Central Concrete Supply	5259	554740	4177860	6.91	0.071	0.0066	0.225
	Resident	11 Bowman Ct	433	554440	4176900	0.805	0.0018	-	0.0050
		41 Bowman Ct	632	554380	4176940	-	-	0.0006	0.0048
Total Project	Worker	Central Concrete Supply	5259	554740	4177860	6.934	0.072	0.0066	0.235
	Resident	11 Bowman Ct	433	554440	4176900	0.827	0.002	-	0.006
		41 Bowman Ct	632	554380	4176940	-	-	0.0006	0.005
Baseline	Worker	Central Concrete Supply	5268	554740	4177860	8.741	0.0879	0.011	0.193
	Resident	11 Bowman Ct	433	554440	4176900	0.805	0.0020	-	0.00401
		41 Bowman Ct	632	554380	4176940	-	-	0.001	0.00383
Net Project	Worker	Central Concrete Supply	5259	554740	4177860	-1.807	-0.016	-0.004	0.041
	Resident	11 Bowman Ct	433	554440	4176900	0.023	-0.0002	-	0.002
		41 Bowman Ct	632	554380	4176940	-	-	-0.0003	0.002
Risk Associated with Existing Sources	Worker	Central Concrete Supply	5259	554740	4177860	32.48			7.912
	Resident	11 Bowman Ct	433	554440	4176900	42.32			8.365
Cumulative	Worker	Central Concrete Supply	5259	554740	4177860	30.68			7.953
	Resident	11 Bowman Ct	433	554440	4176900	42.35			8.367

Table 2. Sensitive Receptors Results

Scenario	Receptor Type	Address Associated Receptor Type	Receptor ID	UTM Easting (m)	UTM Northing (m)	Maximum Cancer Risk (per million)	Maximum Chronic HI	Maximum Acute HI	$PM_{2.5}$ Concentration ($\mu g/m^3$, Annual Average)
Construction	Healthcare Patients	1337 Evans Ave, San Francisco, CA 94124	1539	554340	4177120	-	-		0.00026
			1639	554320	4177140	-	5.87E-06		0.00026
		3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	4651	553960	4177740	0.0046	-		0.00023
	Daycare Children	1591 Hudson Ave, San Francisco, CA 94124	1518	553920	4177120	0.0030	3.44E-06		0.00015
Construction Worker Trips						0.02			0.0005
Project	Healthcare Patients	1337 Evans Ave, San Francisco, CA 94124	1539	554340	4177120	-	-	0.0005	0.0070
			1639	554320	4177140	-	0.0025	-	0.0070
		3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	4651	553960	4177740	1.780	-	-	0.0077
	Daycare Children	1591 Hudson Ave, San Francisco, CA 94124	1518	553920	4177120	0.601	0.0015	0.0004	0.0044
Total Project	Healthcare Patients	1337 Evans Ave, San Francisco, CA 94124	1539	554340	4177120	-	-	0.000540	0.008
			1639	554320	4177140	-	0.00249	-	0.008
		3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	4651	553960	4177740	1.805	-	-	0.008
	Daycare Children	1591 Hudson Ave, San Francisco, CA 94124	1518	553920	4177120	0.624	0.002	0.000	0.005
Baseline	Healthcare Patients	1337 Evans Ave, San Francisco, CA 94124	1539	554340	4177120	-	-	0.0011	0.0057
			1639	554320	4177140	-	0.0028	-	0.0057
		3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	4651	553960	4177740	2.202	-	-	0.0058
	Daycare Children	1591 Hudson Ave, San Francisco, CA 94124	1518	553920	4177120	0.804	0.0017	0.001	0.0035
Net Project	Healthcare Patients	1337 Evans Ave, San Francisco, CA 94124	1539	554340	4177120	-	-	-0.0006	0.002
			1639	554320	4177140	-	-0.0003	-	0.002
		3450 3rd St, Building 2, Suite 2a, San Francisco, CA 94124	4651	553960	4177740	-0.398	-	-	0.003
	Daycare Children	1591 Hudson Ave, San Francisco, CA 94124	1518	553920	4177120	-0.180	-0.00016	-0.00035	0.002

APPENDIX H
SOCIOECONOMIC CONTEXT

Socioeconomic Context of San Francisco's Bayview Neighborhood and Project Site

This section provides the socioeconomic context for the Bayview neighborhood and the project site. In San Francisco, as in many other cities, low-income households and people of color are more likely to live in neighborhoods with environmental hazards, such as toxic groundwater, polluting industrial activities, congested freeways, and hazardous and solid waste facilities. In large part, this is the direct result of racial covenants, redlining, urban renewal, and other discriminatory programs that have historically restricted where people of color may live.[1]

Bayview is a large residential and industrial neighborhood in southeast San Francisco, covering 3,132 acres and encompassing neighborhoods like Hunters Point, India Basin, Bayview, Silver Terrace, and Bret Harte. Its boundaries are Cesar Chavez Boulevard to the north, the U.S. 101 (Bayshore Freeway) to the west, and San Francisco Bay to the east and south.

As shown in **Table 1**, there is a relatively high rate of homeownership in Bayview; owner-occupied housing units account for 52 percent of the residential properties in the neighborhood, compared to 39 percent for San Francisco as a whole. Although homeownership is high, unsheltered individuals are a visible presence in this neighborhood, as in many San Francisco neighborhoods. In 2024, the Department of Homelessness and Supportive Housing estimated that the unsheltered population in San Francisco Supervisorial District 10, which includes the Bayview neighborhood, is about 1,462 persons, accounting for approximately 34 percent of San Francisco's total unsheltered population (4,354 persons). More recently, in May 2025, the Healthy Streets Operation Center (HSOC) identified 437 vehicles being used as dwellings across San Francisco with approximately 39 percent of these located within the Bayview Police District, clustered near 3rd Street (west of Cargo Way), India Basin, Hunters Point, and Bret Harte. There have been reports of unsheltered people occupying abandoned buildings and structures on Pier 90. Port security actively patrols the waterfront and responds to reports of homeless encampments in compliance with the City's encampment response policy.

The Bayview neighborhood is more diverse demographically, has a lower median income, and has a higher rate of "limited English-speaking households" than San Francisco as a whole. As shown in **Table 1**, the current Black/African American population comprises 23 percent of the neighborhood's total population, a decrease from historic figures. The African American population was reported to comprise 73 percent of the neighborhood's total population in 1980. In Bayview, 47 percent of residents reported their educational attainment as high school or less, compared to 23 percent for San Francisco as a whole. Furthermore, 19 percent of the neighborhood residents reported attaining a college degree, compared to 35 percent for San Francisco as a whole. Additionally, 15 percent of all Bayview households are limited English-speaking households; San Francisco's overall linguistic isolation rate is 11 percent. With respect to income, median household income for the neighborhood is $84,197, which is about 60 percent of San Francisco's median household income of $141,446. Additionally, the poverty rate of Bayview is 16 percent, compared to San Francisco's poverty rate of 11 percent.

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[1] San Francisco Planning Department, *Housing Element 2022 Update*, January 2023, https://generalplan.sfplanning.org/I1_Housing.htm, accessed May 23, 2025.

Table 1: Demographics of Bayview Compared to San Francisco as a Whole

Attribute	Bayview [1]	San Francisco
Population		
Total Population	39,816	836,321
Race/Ethnicity[2]		
Asian	39%	35%
Hispanic or Latino (of any race)	24%	16%
Black/African American	23%	5%
White	8%	38%
Other/Two or More Races	5%	7%
Native Hawaiian/Pacific Islander	1%	0%
American Indian/Alaska Native	0%	0%
Educational Attainment (25 years and over)		
High School or Less	47%	23%
Some College/Associate Degree	26%	17%
Bachelor's Degree	19%	35%
Graduate/Professional Degree	8%	25%
Limited English-Speaking Households[3]		
Percentage of All Households	15%	11%
Housing[2]		
Owner Occupied	52%	39%
Renter Occupied	48%	62%
Income		
Median Household Income[4]	$84,197	$141,446
Median Family Income[5]	$86,803	$165,603
Per Capita Income	$42,187	$90,285
Below Poverty Level	16%	11%
Employment		
Unemployment Rate	10%	6%

Source: U.S. Census Bureau, *American Community Survey 2023 5-Year Estimates* (Tables DP05, DP02, S1602, DP04, S1901, S1701 and DP03). Data compiled by Planning Department 2025.

Notes:

1 Statistics are compiled for the Bayview Census County Division (Bayview CCD), which includes 11 census tracts. The Bayview neighborhood is comparable to the Bayview CCD because it includes the same 11 census tracts; however, it is slightly smaller because its boundaries exclude portions of census tracts 610 and 9809, which are fully included in the Bayview CCD.

2 Totals may not equal 100% due to rounding.

3 A "limited English-speaking household" is one in which no member 14 years old and over (1) speaks only English or (2) speaks a non-English language and speaks English "very well." In other words, all members 14 years old and over have at least some difficulty with English. By definition, English-only households cannot belong to this group.

4 Median Household Income: This includes the income of the householder and all other individuals 15 years old and older in the household, whether they are related to the householder or not. Because many households consist of only one person, average household income is usually less than average family income. Median income, which applies to both household and family income in this context, divides income distribution into two halves. Median income is interpolated based on the distribution of the total number of households and families, including those with no income.

5 Median Family Income: Family income is the sum of all incomes of members 15 years old and older who are related to the householder.

In addition to the socioeconomic profile data presented in **Table 1**, the California Office of Environmental Health Hazard Assessment's CalEnviroScreen 4.0[2] identifies California communities that are disproportionately burdened by multiple sources of pollution. This tool combines pollution burden and population characteristics to derive a "score" (from 0 to 100) for census tracts that can then be compared across the state. More specifically, CalEnviroScreen 4.0 statistically assesses 21 indicators to characterize pollution burden and population. Examples of pollution burden data include ozone, diesel particulate matter, hazardous waste, and traffic impacts; examples of population characteristics data include asthma, cardiovascular disease, poverty, and unemployment. See **Figure 1** for the CalEnviroScreen 4.0 results for San Francisco. The project site is adjacent to an area considered to be "High Pollution, Low Population," meaning that it has a high level of pollution burden, but residential use is limited;[3] this is consistent with the site's zoning, in which residential use is not permitted.[4] The nearest residential uses are approximately 3,000 to 3,500 feet southwest of the project site, and include single-family homes along Hudson Avenue, duplex homes along Bowman Court and Rebecca Lane, and three- to four-story apartment buildings along Fairfax and Acacia avenues and Catalina Street. The closest businesses include Central Concrete Supply (adjacent to the site's northwestern boundary) and Darling International (480 feet west of the site). Both of these operations have people that work outside.

As noted previously, the project site is within an environmental justice community as identified by the city pursuant to California Senate Bill 1000. The environmental, health, and socioeconomic stressors experienced by these adjacent populations render them more vulnerable to the impacts of pollution. For example, exposure to outdoor air pollution can trigger asthma attacks and has been shown to increase the risk of death following a heart attack.[5] **Figure 2** and **Figure 3** show the number of emergency room visits for asthma and acute myocardial infarction (or heart attack), respectively, per 10,000 people for each census tract within San Francisco. The Bayview neighborhood has one of the highest asthma-related emergency room visit rates in San Francisco, with a rate of 124 visits/10,000 people in the census tracts to the south of the project site. Similarly, these census tracts exhibit one of the highest heart attack-related emergency room visit rates in San Francisco, with a rate of about 12 visits/10,000 people. There are various federal, state, and local air quality regulations in place that seek to improve air quality conditions; these regulations are discussed in more detail in Section 3.C, Air Quality.

Assembly Bill (AB) 617 was enacted in 2017 to reduce air pollution and preserve public health, with specific direction for local air districts to take measures to protect communities disproportionally impacted by air pollution. The Bayview Hunters Point/Southeast San Francisco Community includes the entirety of the "Bayview Neighborhood" as shown on **Figures 1** through **3** and includes additional areas west of U.S. 101 and north of Cesar Chavez Street. This area was selected by the California Air Resources Board in February 2023 as an AB 617 community because of its air quality challenges, environmental justice grievances, and health inequities. This community is impaired by legacy pollution from the Naval Shipyard; dust and asbestos from ongoing large-scale redevelopment; dust from aggregate facilities and concrete batch plants; odors and emissions from a wastewater treatment facility, diesel truck idling, and an industrial rendering plant; and mobile source pollution burdens from the two busy freeways that traverse the community and

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2 California Office of Environmental Health and Hazard Assessment, *CalEnviroScreen 4.0 Report*, 2021, https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf, accessed May 28, 2025.

3 The project site is adjacent to, but not within the census tract boundaries used by CalEnviroScreen.

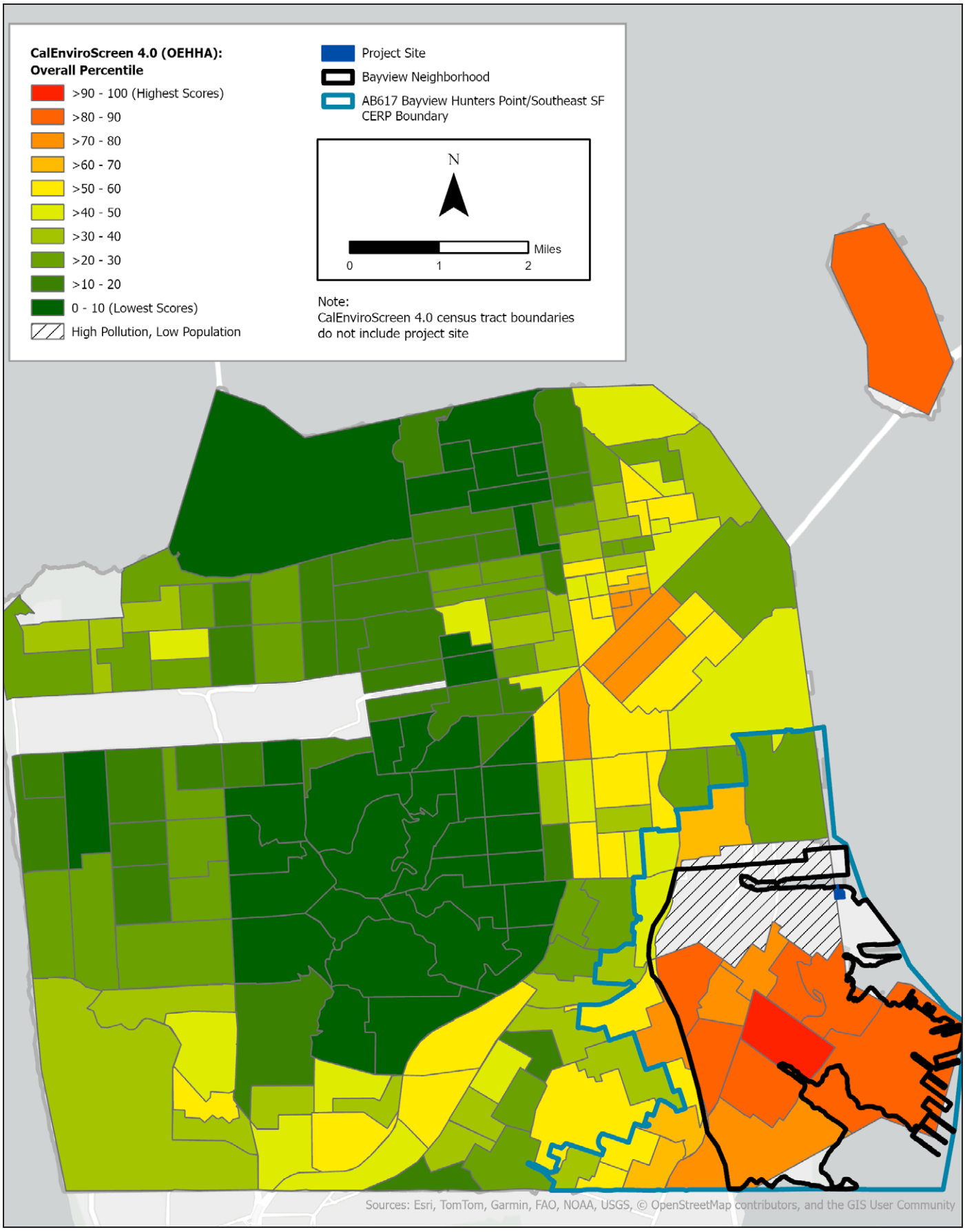
4 CalEnviroScreen draft 5.0 does not use this designation. It shows the project site in an area with a score between 80-90.

5 California Office of Environmental Health and Hazard Assessment, *CalEnviroScreen 4.0 Report*, 2021, https://oehha.ca.gov/media/downloads/calenviroscreen/report/calenviroscreen40reportf2021.pdf, accessed May 28, 2025.

bring vehicular and truck traffic through the community.[6] The Air District has partnered with the Bayview Hunters Point Community Advocates and the Marie Harrison Community Foundation to conduct a Community Emissions Reduction Plan process that will serve as a blueprint for improving air quality in Bayview Hunters Point and southeast San Francisco.[7] The Air District plans to adopt the Bayview Hunters Point/Southeast San Francisco Community Emissions Reduction Plan in early 2027.

[6] Bayview Hunters Point Community Advocates and Marie Harrison Community Foundation, *Letter to Bay Area Air Quality Management District re AB 617 Community Self-Nomination Submittal for Bayview Hunters Point*, September 21, 2020, https://www.baaqmd.gov/~/media/files/ab617-community-health/bayview-hunters-point/documents/bvhp-colead-community-self-nomination-letter-to-baaqmd-ocr-pdf.pdf?la=en&rev=a16bd7025d364ff097889af509ac08f1.

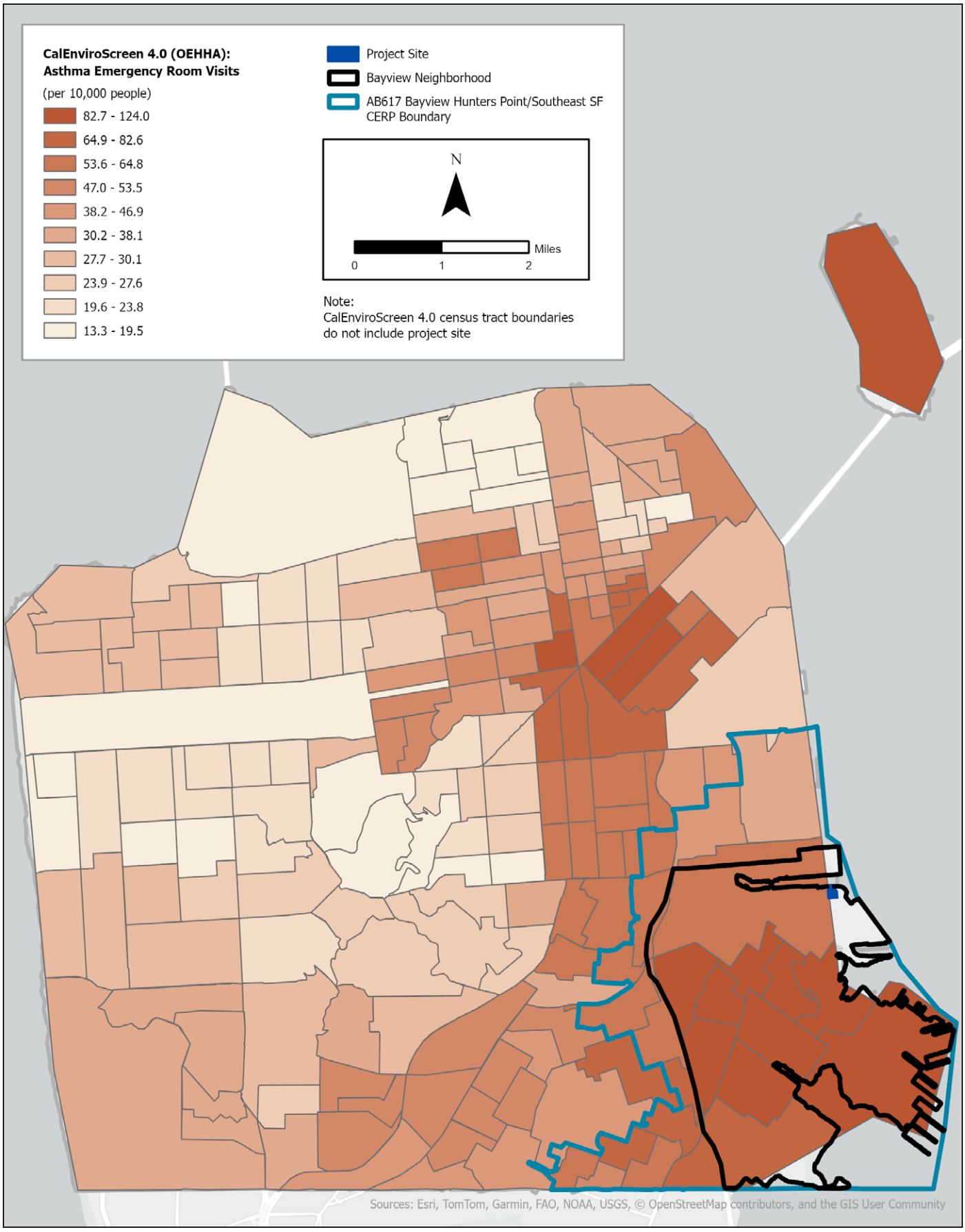
[7] Bay Area Air Quality Management District website, https://www.baaqmd.gov/community-health/community-health-protection-program/bayview-hunters-point-community-emissions-reduction-plan.



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Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

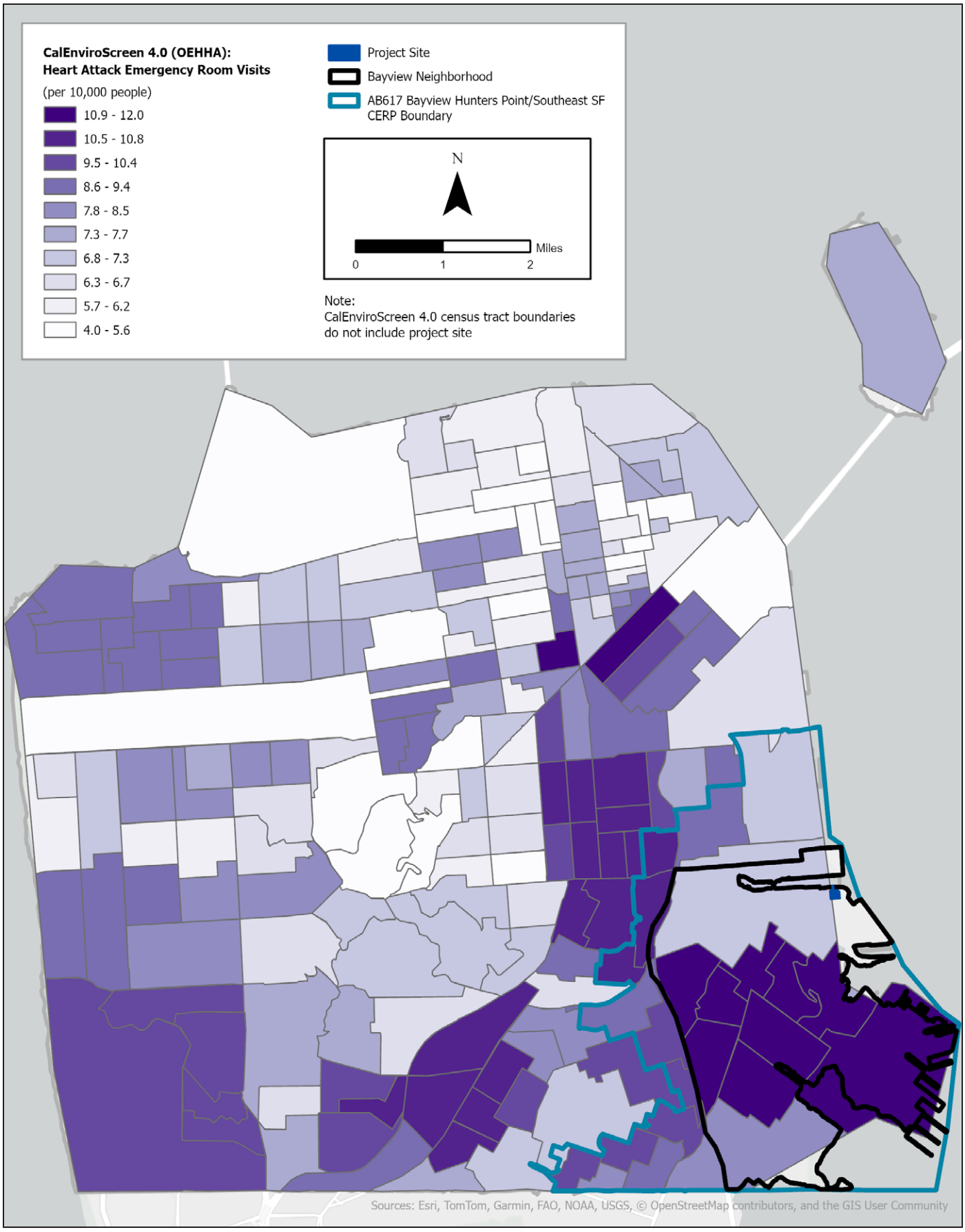
Figure 1
CalEnviroScreen 4.0 Results for San Francisco



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Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 2
Asthma Emergency Room Visitation Rates for San Francisco



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Pier 92 Modernization and Plant Replacement Project
Case No. 2024-005922ENV

Figure 3
Heart Attack Emergency Room Visitation Rates for San Francisco