APPENDIX A

Stantec

Memo

To:	Zoe Merideth City of Antioch	From:	Elena Nuño & Megna Murali Stantec Consulting Services Inc.
File:	185705365	Date:	May 21, 2021

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

MODELING PARAMETERS AND ASSUMPTIONS

The following modeling parameters and assumptions will be used to generate criteria air pollutant and greenhouse gas (GHG) emissions for the Amports Antioch Auto Processing Facility Project (project).

MODEL SELECTION

The California Emissions Estimator Model (CalEEMod) is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. CalEEMod quantifies direct emissions from construction and operation activities (including vehicle use), as well as indirect emissions, such as GHG emissions from energy use, solid waste disposal, vegetation planting and/or removal, and water use. Further, CalEEMod identifies mitigation measures to reduce criteria pollutant and GHG emissions along with calculating the benefits achieved from measures chosen by the user.

CalEEMod was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California Air Districts. Default data (e.g., emission factors, trip lengths, meteorology, source inventory, etc.) have been provided by the various California Air Districts to account for local requirements and conditions.

CalEEMod version 2016.3.2 will be used to estimate construction and some operational impacts of the proposed project.

Off-model calculations will be required to address some unique operational characteristics of the project, such as the marine vessels and truck carriers. Emission factors from several sources will be used including the U.S. EPA Port Emissions Inventory Guidance (U.S. EPA, 2020), CARB Ocean Going Vessels (2019), CARB Harbor Craft Emissions Estimation (2010) and U.S. EPA AP42 Compilation of Air Emission Factors.

AIR POLLUTANTS AND GHGS TO BE ASSESSED

Criteria Pollutants Assessed

The following criteria air pollutants will be assessed in this analysis: ROG, NO_X, PM_{10}, and $PM_{2.5}$.

Note that the proposed project would emit ozone precursors ROG and NO_X. However, the proposed project would not directly emit ozone since it is formed in the atmosphere during the photochemical reaction of ozone precursors.

GHGs Assessed

This analysis is restricted to GHGs identified by AB 32, which include CO_2, CH_4, N_2O, HFCs, PFCs, SF_6, and NF_3. The proposed project would generate a variety of GHGs, including several defined by AB 32 such as CO_2, CH_4 and N_2O.

Certain GHGs defined by AB 32 would not be emitted by the project. HFCs, PFCs, SF_6, and NF_3 are typically used in industrial applications, none of which would be used by the proposed project. Therefore, it is not anticipated that the proposed project would emit those GHGs.

GHG emissions associated with the proposed project construction, and operations will be estimated using CO_2e emissions as a proxy for all GHG emissions. Construction GHG emissions would be amortized over the lifetime of the Project. To obtain the CO_2e, an individual GHG is multiplied by its GWP. The GWP designates on a pound for pound basis the potency of the GHG compared to CO_2.

THRESHOLDS

Nearly all development projects in the Bay Area have the potential to generate air pollutants that may increase the difficultly of attaining National Ambient Air Quality Standards and CAAQS. Therefore, for most projects, evaluation of air quality impacts is required to comply with CEQA. The BAAQMD has developed the CEQA Air Quality Guidelines to help public agencies evaluate air quality impacts (BAAQMD 2017c). The BAAQMD's guide includes recommended thresholds of significance, including mass emission thresholds for construction-related and operational ozone precursors. The May 2017 version of the Guidelines includes revisions made to the BAAQMD's 2010 Guidelines to address the California Supreme Court's 2015 opinion in *Cal. Bldg. Indus. Ass'n vs. Bay Area Air Quality Mgmt. Dist.*, 62 Cal.4th 369.

The regional project-level emissions for the project will be estimated and compared to the BAAQMD thresholds for determining significance under CEQA.

Table 1: BAAQMD Project-Level Air Quality CEQA Thresholds of Significance

Criteria Pollutants	Construction-Related	Operational-Related	
Criteria Air Pollutants and Precursors (regional)	Average Daily Emissions (lbs/day)	Average Daily Emissions (lbs/day)	Maximum Annual Emissions (tpy)
ROG	54	54	10
NO_x	54	54	10
PM_{10} (exhaust)	82	82	15
$PM_{2.5}$ (exhaust)	54	54	10

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Criteria Pollutants	Construction-Related	Operational-Related
$PM_{10}/PM_{2.5}$ (fugitive dust)	Best Management Practices	None
Local CO	None	9.0 ppm (8-hour average), 20.0 ppm (1-hour average)
GHGs (projects other than stationary sources)	None	Compliance with Qualified GHG Reduction Strategy OR 1,100 $MTCO_2e/yr$ OR 4.6 $MTCO_2e/SP/yr$ (residents + employees)
GHGs – Stationary Sources	None	10,000 $MTCO_2e/yr$
Risk and Hazards for new sources and receptors (Individual Project)	Same as operational thresholds	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >10.0 in a million Increased non-cancer risk of > 1.0 Hazard Index (Chronic or Acute) Ambient PM2.5 increase: > 0.3 µg/m^3 annual average Zone of Influence: 1,000-foot radius from property line of source or receptor
Risk and Hazards for new sources and receptors (Cumulative Threshold)	Same as operational thresholds	Compliance with Qualified Community Risk Reduction Plan OR Increased cancer risk of >100.0 in a million Increased non-cancer risk of > 10.0 Hazard Index (Chronic or Acute) Ambient PM2.5 increase: > 0.8 µg/m^3 annual average Zone of Influence: 1,000-foot radius from
Accidental Release of Acutely Hazardous Air Pollutants	None	Storage or use of acutely hazardous materials locating near receptors or new receptors locating near stored or used acutely hazardous materials considered signficant.
Odors	None	Five confirmed complaints per year averaged over three years.

Notes:

CO = carbon monoxide

GHG = greenhouse gases

lbs/day = pounds per day

$MTCO_2e/yr$ = metric tons of carbon dioxide equivalent per year

$MTCO_2e/SP/yr$ = metric tons of carbon dioxide equivalent per service population per year

NOx = nitrogen oxide

$PM_{2.5}$ = particulate matter 2.5 microns or less in diameter

PM_{10} = particulate matter 10 microns or less in diameter

ppm = parts per million

ROG = reactive organic gas

tpy = tons per year

Source: BAAQMD 2017

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ASSUMPTIONS

CONSTRUCTION MODELING ASSUMPTIONS

The construction schedule utilized in the analysis represents a “worst-case” analysis scenario since emission factors for construction equipment decrease as the analysis year increases, due to improvements in technology and more stringent regulatory requirements. Therefore, construction emissions would decrease if the construction schedule moves to later years. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required per CEQA guidelines. Site specific construction fleet may vary due to specific project needs at the time of construction.

The proposed project would require two different construction methods for the landside and waterside construction. Table 2 provides the construction schedule and offroad equipment list for the waterside construction. Table 3 provides the onroad construction vehicles associated with the waterside construction. Table 4 provides the construction schedule and offroad equipment list for the landside construction and Table 5 provide the landside onroad vehicle equipment list for construction.

Construction emissions will be totaled for each calendar year and divided by the total number of construction days to arrive at the average daily emissions. The average daily emissions will be compared to the BAAQMD thresholds of significance.

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Table 2: Project Construction Schedule and Equipment List – Waterside

Phase	Start Date	End Date	Construction Equipment	QTY	HP	Load Factor	Hours of Use per Day
Mobilization[1]	9/3/2021	9/3/2021	Tug Boats	2	1200	0.45	8
	3/15/2022	3/15/2022	Tug Boats	2	1200	0.45	8
Pile Driving[2]	9/6/2021	11/30/21	Derrick Barge	1	500	0.43	2
	9/6/2021	11/30/21	Vibratory Hammer	1	1050	0.6	5
	9/6/2021	11/30/21	Impact Hammer	1	300	0.6	3
Deck Construction	9/3/2021	9/7/2021	Derrick Barge (demo)	1	500	0.43	8
	11/3/2021	2/8/2022	Derrick Barge (new deck construction)	1	500	0.43	6
Fenders, Wharf Appurtenances, Utilities[3]	11/30/2021	3/15/2022	Derrick Barge (new deck construction)	1	500	0.43	4
Punch List and Final Completion	3/30/2022	4/12/2022	None				

Notes

1- Tug boats will come into place barges and then return to remove the barges when done (2 days)

2 These will not be used every day during this period. Pile driving during this period is expected to take 30 days. But some cannot be completed until after the concrete deck has been placed. Distribution of vibratory vs impact hammer use is an estimate. Pile driving equipment modeled in CalEEMod as large excavators with pile driving attachments.

3 - Fenders, here, refers to installing the pile caps, fenders and fender panels on already driven steel piles. Plastic fender piles are included above in "pile driving." This phase may overlap and extend once the Deck Construction is complete, but the work would only be a few hours per day of use for at most 10 days for this group of tasks.

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Table 3: Project Construction Onroad Vehicles Equipment List – Waterside

Phase	Start Date	End Date	Maximum Heavy-Duty Diesel Truck Haul Trips per Day (HHDT)	Total Haul Trips	Maximum Vendor Trips Per day (MHDT, HHDT)	Total Vendor Trips
Mobilization[1]	9/1/2021	9/1/2021	<1	2	1	1
Pile Driving[2]	9/6/2021	11/2/2021	0	0	0	0
Deck Construction	11/3/2021	2/8/2022	<1	56	0	0
Fenders, Wharf Appurtenances, Utilities	11/30/2021	3/29/2022	<1	3	0	0
Punch List and Final Completion	3/30/2022	4/12/2022	<1	2	1	1

Notes:

HHDT = Heavy Duty Diesel Trucks MHDT = Medium Heavy Duty Diesel Trucks

Haul Trips are assumed to be HHDT and Vendor Trips are a mixture of MHDT and HHDT

1. Mobilization of staging area will precede waterside mobilization

2. There are not anticipated to be land haul trips due to pile driving. Piles will be on the materials barge.

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Table 4: Project Construction Schedule and Equipment List – Landside

Phase	Start Date	End Date	Working Days	Construction Equipment	QTY	HP	Load Factor	Hours of Use per Day
Mobilization	12/16/2021	12/22/2021	5	No Offroad Equipment				
Erosion Control	12/23/2021	12/29/2021	5	No Offroad Equipment				
Demolition	12/30/2021	1/5/2022	5	Concrete/Industrial Saws	2	40	0.73	6
				Excavators	1	162	0.38	6
				Rubber Tired Dozers	1	247	0.4	6
				Tractors/Loaders/Backhoes	2	97	0.37	6
Utilities Underground Construction (Water, Electrical, Sanitary Sewer, Storm Drain)	1/6/2022	3/30/2022	60	Tractors/Loaders/Backhoes	2	97	0.37	6
				Excavators	1	162	0.38	6
				Rollers	1	80	0.38	6
				Plate Compactors	1	8	0.43	6
Construct Building Foundations (Spread Footings)	3/31/2022	6/1/2022	45	Tractors/Loaders/Backhoes	2	97	0.37	6
				Excavators	1	162	0.38	6
				Rollers	1	80	0.38	6
Erect Pre-Engineered Metal Building	6/10/2022	7/7/2022	20	Cranes	1	226	0.29	6
				Forklifts	2	89	0.2	6
				Generator Sets	2	84	0.74	6
				Tractors/Loaders/ Backhoes	2	97	0.37	6
				Welders	3	46	0.45	6
Site Paving	3/31/2022	6/22/2022	60	Asphalt Cold Planers	2	225	0.78	6
				Asphalt Paver	2	130	0.36	6
				Rollers	2	80	0.38	6
				Tractors/Loaders/ Backhoes	2	97	0.37	6
Erect Light Poles	3/31/2022	4/27/2022	20	Cranes	1	226	0.29	6
Building Interior Construction	7/8/2022	8/4/2022	20	Aerial Lifts	1	62	0.31	6
				Forklifts	1	89	0.2	6
Building Finishes	8/5/2022	9/1/2022	20	Aerial Lifts	1	62	0.31	6
				Forklifts	1	89	0.2	6
Punch List and Final Completion	9/2/2022	9/8/2022	5	No Offroad Equipment				

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Table 5: Project Construction Onroad Vehicles Equipment List – Landside

Phase	Start Date	End Date	Working Days	Maximum Heavy-Duty Diesel Truck Haul Trips per Day(HHDT) Average	Total Haul Trips	Maximum Vendor Trips Per day (MHDT, HHDT)	Total Vendor Trips
Mobilization	12/16/2021	12/22/2021	5	1	5	2	10
Erosion Control	12/23/2021	12/29/2021	5	0	0	2	10
Demolition	12/30/2021	1/5/2022	5	2	10	2	10
Utilities Underground Construction	1/6/2022	3/30/2022	60	0.5	30	0.1	6
Construct Building Foundations	3/31/2022	6/1/2022	45	2.4	108	0	0
Erect Pre-Engineered Metal Building	6/10/2022	7/7/2022	20	0.75	15	0	0
Site Paving	3/31/2022	6/22/2022	60	6.65	399	0	0
Erect Light Poles	3/31/2022	4/27/2022	20	0.5	10	0	0
Building Interior Construction	7/8/2022	8/4/2022	20	0	0	0	0
Building Finishes	8/5/2022	9/1/2022	20	0	0	0	0
Punch List and Final Completion	9/2/2022	9/8/2022	5	1	5	2	10

Notes:

HHDT = Heavy Heavy Duty Diesel Trucks

MHDT = Medium Heavy Duty Diesel Trucks

Haul Trips are assumed to be HHDT and Vendor Trips are a mixture of MHDT and HHDT

OPERATIONAL MODELING ASSUMPTIONS

Operational emissions are those emissions that occur during operation of the proposed project. Operational emissions will be estimated for 2023, the first full year of operation. The sources are summarized below.

Motor Vehicles

Onroad

Motor vehicle emissions refer to exhaust and road dust emissions from the automobiles that would travel to and from the proposed project site. The trip generation rates for each phase of the project are shown in Table 6. Mobile onroad emissions will be estimated using CalEEMod.

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Table 6: Trip Generation Rates Employees and Trucks

Land Use Type	CalEEMod Land Use Type	Unit	Weekday Average Daily Trip Rate	Saturday Average Daily Trip Rate	Sunday Average Daily Trip Rate
Auto Processing/Light Industrial	General Light Industry	25.328 ksf	2.93/ksf[2]	0	0
Auto Processing/Light Industrial	User Defined Commercial	35 employees[1]	0.2375/emplolyee[3]	0	0
Auto Processing/Light Industrial	User Defined Industrial	14.62 trucks	2/truck	0	0
Auto Processing/Light Industrial	Manufacturing	1 passenger vehicle	144.24[4]	0	0

Notes:

ksf = 1,000 square feet

1. From Project Applicant, 2021

2. From Stantec Transportation Study, 2021, 30 employees would generate 2.47 trips per day, resulting in 74.1 trips per weekday. To arrive at the trip rate based on the building size, the total employee trips were divided by the building size in ksf.

3. Up to 35 stevedores are anticipated for each vessel unloading, up to 25 times per year x 2.47 trips per employee = 2,161 trips per year

4. Up to 37,500 vehicles would be unloaded at the site based on 25 vessels with up to 1,500 vehicles per vessel. The weekday trip generation would be 37,500 divided by 260 weekdays.

Trip Lengths

The CalEEMod default round trip lengths for an urban setting will be used in this analysis for the employee trips. Commercial trip types are defined as Commercial to Commercial (C-C), Commercial to Work (C-W) and Commercial to Non-Work (C-NW). The CalEEMod defaults of 28 percent C-C, 59 percent C-W, and 13 percent C-NW were revised to 100 percent C-W. The CalEEMod default trip length of 9.5 miles for C-W trips was retained. Trip lengths are for primary trips. Trip purposes are primary, diverted, and pass-by trips. Diverted trips are assumed to take a slightly different path than a primary trip. All trips for the project were assumed to be primary trips.

The project would also include heavy duty diesel truck trips to haul vehicles to their final destination. The typical radius/distance for a vehicle coming to the Bay Area region is about 50 miles, as most vehicles imported to the area will be delivered to Bay Area/Northern California dealerships. Approximately 90 percent of the vehicles would be delivered within the 50 mile range. The remaining 10 percent would be greater than 50 miles with 200 miles as likely the farthest. The weighted trip length for the trucks was estimated at 65 miles.

Up to 1,500 vehicles would be unloaded from each vessel. The vehicles are driven off the ships through the roll on roll off wharf operations (RORO). Vehicles are then staged throughout the site prior to and after processing. Vehicles are then brough to the new facility being constructed for inspection and accessorizing. The final step for the vehicles is to be driven to the truckaway area and loaded onto trailers.

AMPORTS does not have an identified vendor for the vehicles but anticipates that only passenger car vehicles will be transported to the site. Based on the site configuration it is estimated that vehicles may be driven up to one mile on the project site from RORO to final loading onto trucks.

Vehicle Fleet Mix

The vehicle fleet mix is defined as the mix of motor vehicle classes active during the operation of the proposed project. Emission factors are assigned to the expected vehicle mix as a function of vehicle class, speed, and fuel use (gasoline- and diesel-powered vehicles). The CalEEMod default fleet mix was revised for the full-time employees and part-time stevedores to reflect passenger car vehicles. Table 7 provides the fleet mix used in the operational analysis of the landside activities.

Table 7: CalEEMod Fleet Mix for Contra Costa County – Year 2023

Vehicle Category	Default	AMPORTS Employees	Delivery Trucks	Unloading/Loading of Vehicles
LDA	0.59	0.60	0	.65
LDT1	0.04	.04	0	.05
LDT2	0.19	0.2	0	.20
MDV	0.12	0.14	0	.10
LHD1	0.015	0.01	0	0
LHD2	0.005	0.01	0	0
MHD	0.010	0	0	0
HHD	0.024	0	1	0
OBUS	0.001	0	0	0
UBUS	0.001	0	0	0
MCY	0.005	0	0	0
SBUS	0.002	0	0	0
MH	0.0008	0	0	0
Total	1	1	0	1

Area Sources

Consumer Products

Consumer products are various solvents used in non-industrial applications that emit ROGs during their product use. These typically include cleaning supplies, kitchen aerosols, cosmetics and toiletries. The default CalEEMod value was used for this project for a light industrial land use.

General Category

Emission Factor (lb ROG/sqft/day): 0.0000214

Parking

Degreaser Emission Factor (lb ROG/sqft/day): 0.0000003542

Architectural Coatings (Painting)

Paints release VOC emissions. The building would be repainted on occasion. CalEEMod assumes a 10 percent reapplication rate and a emission factor of 100 grams of ROG per liter for non-residential interior surfaces and 150 grams of ROG per liter for non-residential exterior surfaces.

Energy Use

The emissions associated with the building electricity and natural gas usage (non-hearth) are estimated based on the land use type and size. The electricity energy use is in units of kilowatt hours per size metric for each land use type. Natural gas use is in units of a thousand British Thermal Units per size metric for each land use type. Table 8 provides a summary of the energy use of the building to be constructed onsite.

Table 8: Operational Energy Use – Main Building

Land Use Subtype	Title 24 Electricity Energy Intensity KWhr/size/year)	Nontitle-24 Electricity Energy Intensity (KWhr/size/year)	Lighting Energy Intensity (KWhr/size/year)	Title-24 Natural Gas Energy Intensity (KBTU/size/year)	Nontitle-24 Natural Gas Energy Intensity (KBUT/size/year)
General Light Industry 25,328 square feet	1.48	3.7	3.08	19.71	6.67
Parking Lot	0	0	0.35	0	0

Water and Wastewater Use

Supplying and treating water for the project generates GHG emissions. Depending on the specific water supply used or treatment method used these numbers can vary over a wide range. Supplying

water is bringing the water from its primary source such as the ground, river, or snowpack to the treatment plant. Distributing the water is bringing the water from the treatment plant to the end users. The electricity intensity factors are multiplied by the utility GHG emissions intensity factors for the GHGs and are classified as indirect emissions. The default electricity intensity is from the CEC's March 2019 Refining Estimates of Water-Related Energy Use in California.

Wastewater may also have direct emissions of GHGs. These depend on the type of wastewater treatment system.

The CalEEMod default indoor water use for a light industrial land use is estimated to be 5,857,563 gallons per year. Based on experience, AMPORTS estimated that the vehicle processing building would demand approximately 500 gallons per day of water for a total of 130,000 gallons of water. Wastewater was also estimated at 500 gallons per day based on the 5,000 square feet of office uses (industry standard 0.1 gallons per day of wastewater flow per gross square feet.). Table 9 provides a summary of the water and wastewater energy use for the project.

Table 9: Water and Wastewater Energy Use

Source	CalEEMod Default
Electricity Intensity Factor to Supply (kWhr/Mgal)	2,117
Electricity Intensity Factor to Treat (kWhr/Mgal)	111
Electricity Intensity Factor to Distribute (kWhr/Mgal)	1,272
Electricity Intensity Factor for Wastewater (kWhr/Mgal)	1,911

Solid Waste

GHG emissions are associated with the disposal of solid waste generated by the vehicle trips to transport solid waste from the proposed project into landfills. Project generated construction waste would need to be in coordination with diversion requirements of the City.

The CalEEMod default of 31.41 tons per year was used to estimate emissions.

Marine Vessels

The project would also include up to 25 vessel calls per year at the site. Each vessel would require two tug assists for incoming and outgoing travel. The project is not anticipated to induce growth in the car import market and increase the number of vessels coming into the State. The vessels travelling to the AMPORTS facility may also have cargo for other facilities and ports in the Bay Area.

Ocean-Going Vessels

Data from the Port of Oakland 2017 Emission Inventory (Port of Oakland, 2017) showed that while most of the Ocean-Going Vessels (OGVs) stopped at one port facility, some OGVs made multiple stops. The OGV emission calculations primarily relied upon EPA's 2020 port guidance document

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(U.S. EPA, 2020). The OGV fleet tier composition, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory (Port of Oakland, 2017). Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than 1 percent make 4 stops in the bay.

BAAQMD's New Source Review Rule provides guidance for evaluating marine vessel's potential to emit for projects with a stationary source that is seeking a permit to operate from the Air District. Section 2-2-610 provides that a facility's potential to emit includes emissions from cargo carriers (other than motor vehicles). Cargo carrier emissions are included as emissions from the source that receives or loads the cargo. All emissions from cargo carrier operation within the District's jurisdictional boundaries must be included, and in cases of ships, emissions from off-shore operation out to 11 nautical miles (12.66 statute miles) from the Golden Gate Bridge must also be included. (See BAAQMD Reg. 2-2-610 for further details. Although AMPORTS will not require any permits from BAAQMD, the recommendation for off-shore emissions is incorporated into the project. A total of 126 nautical miles were used to estimate marine vessel travel emissions to and from the port (the starting point of the emissions estimate is from Sea Buoy approximately latitude 37.74993°and longitude -122.6928° degrees).

Air emissions have been quantified for three distinct operating modes of ocean-going vessels, transit (emissions from vessel operations between ports), maneuvering (slow speed vessel operations while in port areas) and hoteling while moored to a dock. No emissions from any anchorage activities were estimated as it is speculative to estimate emissions for anchorage for this type of project. Furthermore, emissions from anchorage are likely to be small because vessel arrival is timed to avoid anchorage, berth congestion is unlikely due to this being a single berth and the ability to convey timing to vessels. Should vessels go into anchorage for this facility they would go into hoteling mode which avoids main engine emissions, and any anchorage location would be close to shipping routes for the AMPORTS facility and would not result in additional travel.

Air emissions have been quantified for two types of engines and a boiler found on OGVs. The main engine is used for propulsion and is used during both transit and maneuvering modes. Auxiliary engines are used for on-board electrical power whilst smaller boilers are present to provide steam heat for fuel heating and hot water. According to the CARB Emission Estimation Methodology, auxiliary engines are used in all three modes of operations (transit, maneuvering, and hoteling); boilers are only used during maneuvering and hoteling (CARB 2011).

The time in mode and load propulsion engine was calculated based on the vessel speed and the distance traveled in each mode.

The time in mode for transit mode of the vessel was determined by assuming transit at 19.1 knots for 8.7 nautical miles, 13.5 knots for 52.8 nautical miles, and 9 knots for 1.5 nautical miles.

The maneuvering mode was determined based on a travel speed of 5.51 knots from the berth to berthing. The maneuvering time was based on the distance traveled divided by speed for docking or undocking.

Hoteling time was determined by the time spent at berth. Hoteling time was estimated to be 8 hours per vessel call. During hoteling it is assumed the ships auxiliary engine and boiler engines are in operation.

Engine power rates were taken from U.S. EPA Port Emissions Inventory Guidance (U.S. EPA, 2020) for auxiliary power and boiler power, and Port of Benicia 2005 Inventory (Port of Benicia, 2005) for propulsion power as shown in Table 10 for auto carriers at the speed of 20.3 knots.

Table 10: Average Vessel Characteristics (U.S. EPA 2020, Port of Benicia 2005)

Mode	Propulsion Power	Auxiliary Power	Boiler Power
	(kilowatts)		
Transit	11,531	950	N/A
Maneuver	11,531	1,125	268
Hoteling	N/A	800	268

At cruise speed, the main engine load is 83.1%. At higher loads, fuel consumption and engine maintenance costs go up dramatically, so vessel operators tend to operate at this level. At slower speeds, main engine load was calculated using the propeller law, which states that propulsion load varies by the cube of the vessel speed.

At main engine loads of less than 20%, engine emissions are multiplied by an adjustment factor which accounts for higher emission rates at low loads. The adjustment factor is calculated using an exponential equation developed by the U.S. EPA. The auxiliary load factors are incorporated in the low load adjustment factors shown in Table 11.

Table 11: Low Load Adjustment Factors (U.S. EPA 2020)

Propulsion Engine Load Factor	NOx	HC	CO	PM	CO_2	SO_2 (0.1% fuelsulfur content)
≤ 2%	4.63	21.18	9.68	7.29	3.28	9.54
3%	2.92	11.68	6.46	4.33	2.44	6.38
4%	2.21	7.71	4.86	3.09	2.01	4.79
5%	1.83	5.61	3.89	2.44	1.76	3.85
6%	1.60	4.35	3.25	2.04	1.59	3.21
7%	1.45	3.52	2.79	1.79	1.47	2.76

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Propulsion Engine Load Factor	NOx	HC	CO	PM	CO_2	SO_2 (0.1% fuelsulfur content)
8%	1.35	2.95	2.45	1.61	1.38	2.42
9%	1.27	2.52	2.18	1.48	1.31	2.16
10%	1.22	2.20	1.96	1.38	1.25	1.95
11%	1.17	1.96	1.79	1.30	1.21	1.78
12%	1.14	1.76	1.64	1.24	1.17	1.63
13%	1.11	1.60	1.52	1.19	1.14	1.51
14%	1.08	1.47	1.41	1.15	1.11	1.41
15%	1.06	1.36	1.32	1.11	1.08	1.32
16%	1.05	1.26	1.24	1.08	1.06	1.24
17%	1.03	1.18	1.17	1.06	1.04	1.17
18%	1.02	1.11	1.11	1.04	1.03	1.11
19%	1.01	1.05	1.05	1.02	1.01	1.05
>=20%	1.00	1.00	1.00	1.00	1.00	1.00

The air emission factors associated with auto carriers were derived from the EPA's 2020 port guidance document (U.S. EPA, 2020). For auto carriers accessing the AMPORTS berth, propulsion engine speed and 0.1% S marine distillate were assumed as shown in Table 12 for main engines adjusted maneuvering mode by the factors shown in Table 11. Auxiliary engines also assumed 0.1% S marine distillate because both the California and Emission Control Area requires that fuel sulfur level shown in Table 13. The emission factors for boilers are shown in Table 14.

Table 12: Propulsion Engine Emission Factors – Transit Mode (g/kW-hr)

Engine Speed	Fuel	CH_4	CO	N_2O	CO_2	NO_X	PM_{10}	$PM_{2.5}$	ROG	SO_X
Slow Speed Diesel	MGO/MDO (0.1% S)	0.012	1.4	0.029	593.11	15.8	0.18	0.17	0.73	0.36

Note: Emission factor is calculated based on the Port of Oakland OGV fleet as reported in the 2017 emission inventory (Port of Oakland, 2017) and U.S. EPA 2020 port guidance document (U.S. EPA, 2020).

Reference: **Amports Antioch Auto Processing Facility – Air Quality Methodology and Assumptions and Results Technical Memorandum**

Table 13: Auxiliary Engine Emission Factors – Transit, Maneuvering & Hoteling (g/kW-hr)

Engine Speed	Fuel	CH_4	CO	N_2O	CO_2	NO_X	PM_{10}	$PM_{2.5}$	ROG	SO_X
Medium Speed Diesel	MGO/MDO (0.1% S)	0.008	1.1	0.029	695.7	9.5	0.19	0.17	0.48	0.42

Note: Emission factor is calculated based on the Port of Oakland OGV fleet as reported in the 2017 emission inventory (Port of Oakland, 2017) and U.S. EPA 2020 port guidance document (U.S. EPA, 2020).

Table 14: Auxiliary Boiler Emission Factors – (g/kW-hr)

Fuel	CH_4	CO	N_2O	CO_2	NO_X	PM_{10}	$PM_{2.5}$	ROG	SO_X
MGO/MDO (0.1% S)	0.002	0.20	0.075	961.8	2.0	0.20	0.19	0.12	0.59

Note: Emission factor is calculated based on the U.S. EPA 2020 port guidance document (U.S. EPA, 2020).

The emission methodology was passed on the following formula:

$$E_{t, om, e} = \Sigma\ Pop * EF_{e, om, f} * Hrs_{om, t} * VP\ om, t * \%Load_{om, t} * Activity$$

Where:

Pop = population

HP_{ave} = Maximum rated average horsepower (kW)

LF = load factor, unitless

Activity = Activity or annual operation (hr/year)

EF = emission factor (units of g/kW*hr)

om = operating mode (transit, maneuvering, hoteling)

t = vessel type (auto)

f = fuel

e = engine type

Tug Boat and Barge Emissions

During construction two tug boats would be used for mobilizing and demobilizing construction on the wharf. In addition, a derrick barge would be used for pile driving.

During operations two tug boats would accompany each vessel into and out of port.

The tug emissions shown in Table 15 were developed using U.S. EPA 2020 emission factors (U.S. EPA 2020). Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory (Port of Oakland, 2017). The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.

Table 15: Tug Boat Emission Factor Table (g/kWh)

Engine	HP	NO_X	PM_{10}	$PM_{2.5}$	VOC	CH_4	CO	CO_2	N_2O	SO_2
Auxiliary	218.67	6.22	0.16	0.15	0.24	0.01	1.0	679.47	0.33	0.01
Propulsion	5,280.48	8.67	0.26	0.25	0.13	0.00	2.16	679.47	0.33	0.01

Notes:
g = grams
hp = horsepower
hr – hour

The harbor craft emissions estimate will be based on the following formula:

Emissions = EF_O x F x (1 +D x A/DL) x HP x LF x Hr

Where:

Emissions = amount of pollutant emitted during one period;

EFO = model year, horsepower and engine use specific zero hour emission factor;

F = fuel correction factor which accounts for emission reduction benefits from burning cleaner fuel;

D = horsepower and pollutant specific engine deterioration factor;

A = the age of the engine when the emissions are estimated;

UL = the vessel type and engine use specific engine useful life;

HP = rated horsepower of the engine;

LF = vessel type and engine specific load factor;

Hr = number of annual operating hours of the engine

For the auxiliary engine likely to be used for the tugs escorting the auto carrier vessel into port, the following assumptions were made:

- 218.67 hp was assumed as the rated horsepower of the auxiliary engine.
- The emission factors for auxiliary engines were provided in Table 13.
- The engine load of the tug boat used to escort the auto carrier vessel is assumed to be 0.43 for the auxiliary engine.

Construction Emissions

The proposed project would generate emissions from construction equipment exhaust, worker travel, and minimal fugitive dust (due to the developed nature of the project site). These construction emissions would include criteria air pollutants from the operation of heavy construction equipment. Construction of the proposed project would be completed in two distinct phases for the landside and wharfside improvements. Construction of both phases of improvements would require approximately 210 workdays.

The construction schedule used in the analysis represents a "worst-case" analysis scenario since emission factors for construction equipment decrease as the analysis year increases due to improvements in technology and more stringent regulatory requirements. Therefore, construction emissions would decrease if the construction schedule extended to later years. The duration of construction activity and associated equipment represent a reasonable approximation of the expected construction fleet as required pursuant to CEQA guidelines. Table 16 provides the construction emissions estimate for the proposed project.

Table 16: Construction Emissions Criteria Air Pollutant Emissions

Year	ROG	NO_X	PM_{10} Exhaust	$PM_{2.5}$ Exhaust
2021	0.25	1.67	0.06	0.05
2022	0.35	2.56	0.10	0.09
Total Tons	0.59	4.23	0.15	0.15
Total Pounds	1184.14	8469.45	308.14	296.72

Average Daily Construction Emissions in Pounds	5.64	40.33	1.47	1.41
BAAQMD Threshold of Significance (average pounds/day)	54	54	82	54
Significant?	**No**	**No**	**No**	**No**

As shown in Table 16, the construction emissions would be below the BAAQMD thresholds of significance.

Operational Emissions

Operational emissions would occur over the lifetime of the proposed project and would be from mobile sources, with the ocean-going vessels (auto carrier vessels) and the harbor craft (tug assists) accounting for 90 percent of all operational emissions. The first full year of operational emissions in 2023 were used to assess potential impacts from project operations. The pollutants of concern include ROG, NOx, PM_{10}, and $PM_{2.5}$. The BAAQMD Criteria Air Pollutant Significance thresholds were used to determine impacts. The unmitigated emission estimates are presented in Table 17.

Table 17: Operational Emissions Criteria Air Pollutant Emissions

Source	ROG	NO_X	PM_{10}	$PM_{2.5}$
Area	0.22	0.00	0.00	0.00
Energy	0.00	0.03	0.00	0.00
Mobile	0.40	9.90	1.64	0.47
Auto Carrier Vessels	1.07	19.36	0.28	0.26
Tug Vessels	0.03	1.69	0.05	0.05
Total Tons	1.72	30.98	1.97	0.78
BAAQMD Threshold of Significance (tons per year)	10	10	15	10
Significant?	**No**	**Yes**	**No**	**No**
Total Pounds	3,440	61,960	3,940	1,560
Average Daily Emissions	9.42	169.75	10.79	4.27
BAAQMD Threshold of Significance (average pounds per day)	54	54	82	54
Significant?	**No**	**Yes**	**No**	**No**

As shown in Table 17, the project would exceed the BAAQMD thresholds of significance for NO_x. Impacts would be potentially significant and would need to be further analyzed.

Construction GHG Emissions

Construction emissions would be generated from the exhaust of equipment, the exhaust of construction hauling trips, and worker commuter trips. The construction phases include, site preparation, site grading, paving, building construction, and architectural coating. $MTCO_2e$ emissions during construction of the project are shown in Table 18.

Table 18: Construction Emissions GHG Emissions

Year	Pollutant	Wharfside Construction	Landside Construction	Total $MTCO_2e$
2021	$MTCO_2e$	98.52	5.5556	104.08
2022	$MTCO_2e$	77.15	246.5053	323.66
Total $MTCO_2e$				**427.73**
Amortized Emissions based on 20-year lease				21.39

The proposed project's estimated maximum yearly construction emissions would be 104 and 324 $MTCO_2e$. Commercial projects are typically amortized over a 30- to 40-year lifespan; however, based on the 20-year lease for the project the emissions were amortized over 20 years. The amortized construction emissions are expected to be 21.39 $MTCO_2e$ per year.

Operation GHG Emissions

Long-term operational GHG emissions would result from project generated vehicular/truck traffic, onsite combustion of natural gas, offsite generation of electrical power over the life of the proposed project, the energy required to convey water to and wastewater from the project site, and the emissions associated with the hauling and disposal of solid waste from the project site. Operation GHG emissions are shown in Table 19.

Table 19: Operational Emissions GHG Emissions (2023)

Source	$MTCO_2e$
Area	0.00
Energy	186.02
Mobile	5,913.33

Auto Carrier Vessels	848.77
Tug Vessels	138.80
Subtotal MTCO2e	*7,086.92*
Amortized Construction Emissions	*21.39*
Total $MTCO_2e$ per year	**7,108.31**
Project Threshold of Significance	10,000
Exceed Threshold of Significance?	**No**

As shown in Table 19, the total project emissions are estimated to be 7,108.31 $MTCO_2e$ per year in 2023, which is below the project thresholds of significance.

ATTACHMENT A: EMISSIONS ESTIMATES

AMPORTS Antioch Facility

1. Vessel Emissions Summary
2. CalEEMod Results
3. Energy Emissions Summary

Vessel Types	Operating Mode	Emissions (g/visit)											BSFC
		NOx	HC	ROG	CO	PM10	PM25	SO2	CO2	CH4	N2O	CO2e	(g/visit)
OGV	Transit	639,004	24,898	30,127	59,173	8,058	7,413	16,386	26,663,988	490	1,261	27,051,887	8,293,355
	Maneuvering	58,439	7,088	8,576	9,186	1,196	1,100	2,975	3,097,277	26	124	3,134,743	763,755
	Hoteling	65,921	2,809	3,399	7,562	1,660	1,527	4,022	6,596,024	56	351	6,701,946	2,057,400
Tugs	Maneuvering	61,461	926	1,121	15,030	1,802	1,748	45	4,845,338	19	2,370	5,551,914	1,518,915

Control for Visits

Annual Visits			25
Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	21.37	85.5%	21.37
Visits w/ 2 stops	2.62	10.5%	2.62
Visits w/ 3 stops	0.91	3.6%	0.91
Visits w/4 stops	0.10	0.4%	0.10
			25.00

Vessel Types	Operating Mode	Emissions (annual avg lb/day)											BSFC
		NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b]	(lb/day)
OGV[c]	Transit[d]	88.81	3.46	4.19	8.22	1.12	1.03	2.28	3705.66	0.07	0.18	3759.57	1152.58
	Maneuvering[e]	8.12	0.99	1.19	1.28	0.17	0.15	0.41	430.45	0.004	0.02	435.65	106.14
	Hoteling[f]	9.16	0.39	0.47	1.05	0.23	0.21	0.56	916.69	0.008	0.05	931.41	285.93
Tugs[g]	Maneuvering	9.28	0.14	0.17	2.27	0.27	0.26	0.007	731.65	0.003	0.36	838.35	229.36
TOTAL		**115.4**	**5.0**	**6.0**	**12.8**	**1.8**	**1.7**	**3.3**	**5784.5**	**0.082**	**0.60**	**5964.98**	**1774.0**
BAAQMD Threshold		*54*	--		*54*	--	*82*	*54*	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

Vessel Types	Operating Mode	Emissions (tons/year)										CO_2e[b]	BSFC
		NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	(metric tons)	(tons/year)
OGV[c]	Transit[d]	16.207	0.631	0.764	1.501	0.204	0.188	0.416	676.283	0.012	0.032	622.439	210.346
	Maneuvering[e]	1.482	0.180	0.218	0.233	0.030	0.028	0.075	78.557	0.0006	0.003	72.128	19.371
	Hoteling[f]	1.672	0.071	0.086	0.192	0.042	0.039	0.102	167.296	0.001	0.009	154.206	52.182
Tugs[g]	Maneuvering	1.694	0.026	0.031	0.414	0.050	0.048	0.001	133.527	0.0005	0.065	138.798	41.858
TOTAL		**21.1**	**0.9**	**1.1**	**2.3**	**0.3**	**0.3**	**0.6**	**1055.7**	**0.015**	**0.11**	**987.57**	**323.8**
BAAQMD Threshold		*10*	--		*10*	--	*15*	*10*	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
EPA 2020 Guidance: https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10102U0.pdf
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

								Occurances	Low Load Adjustment										Emissions Per Visit (g)									
Leg	Mode	Speed (kt)	Distance (nm)	Duration (hr)	Engine	Power (kw)	Load	Per Visit	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Open Ocean	Transit	19.082	8.7	0.455927052	Propulsion	11531	0.831	2	1	1	1	1	1	1	1	1	1	1	137967.9	5239.95	12226.55	1603.413	1475.14	5179778	104.799	253.2642	1615651	3158.695	5257871
Pilot Boarding	Transit	9	1.5	0.166666667	Propulsion	11531	0.087	2	1.35	2.95	2.45	1.61	1.61	1.38		1	1	2.42	7143.664	592.8685	1148.892	99.01033	91.0895	274157.1	4.019448	9.713665	61966.48	293.1786	277152.2
SF Bay Transit	Transit	13.5	52.8	3.911111111	Propulsion	11531	0.294	2	1	1	1	1	1	1		1	1	1	419094.9	15917.01	37139.7	4870.57	4480.924	15734232	318.3403	769.3223	4907746	9594.937	15971449
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28		1	1	9.54	22435.29	3897.856	4156.732	410.5307	377.6882	596702.3	3.680695	8.895013	56744.05	1058.349	599445
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28		1	1	9.54	12651.48	2198.039	2344.022	231.5023	212.9821	336486.2	2.07558	5.015985	31998.53	596.8132	338012.9
Open Ocean	Transit	19.082	8.7	0.455927052	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	8232.082	346.5046	952.8875	163.4046	150.3322	602659.8	6.930091	25.12158	187978.7	367.5097	610319.3
Pilot Boarding	Transit	9	1.5	0.166666667	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	3009.283	126.6667	348.3333	59.73344	54.95477	220305.6	2.533333	9.183333	68716.67	134.3452	223105.6
SF Bay Transit	Transit	15	52.8	3.52	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	63556.06	2675.2	7356.8	1261.57	1160.645	4652855	53.504	193.952	1451296	2837.371	4711690
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Auxiliary	1125	1	1	1	1	1	1	1	1		1	1	1	14218.86	598.5	1645.875	282.2405	259.6613	1040944	11.97	43.39125	324686.3	634.7811	1054174
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Auxiliary	1125	1	1	1	1	1	1	1	1		1	1	1	8018.156	337.5	928.125	159.1582	146.4255	586998.6	6.75	24.46875	183093.8	357.9593	594459
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	712.88	35.644	71.288	71.88931	66.13817	342824	0.71288	26.733	10693.2	209.0585	350808.2
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	402	20.1	40.2	40.53909	37.29596	193321.8	0.402	15.075	6030.0	117.8901	197824.2
Berth	Hoteling	0	0	8.1	Auxiliary	800	1	1	1	1	1	1	1	1		1	1	1	61579.44	2592	7128	1222.335	1124.548	4508149	51.84	187.92	1406160	2749.127	4565445
Berth	Hoteling	0	0	8.1	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	4341.6	217.08	434.16	437.8221	402.7964	2087875	4.3416	162.81	651240	1273.213	2136501

Annual Visits 25

Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	21.4	85.5%	21
Visits w/ 2 stops	2.6	10.5%	3
Visits w/ 3 stops	0.9	3.6%	1
Visits w/4 stops	0.1	0.4%	0

Mode Totals

	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Transit	639001.9	24898.2	59173.16	8057.702	7413.086	26663988	490.1261	1260.557	8293355	16386.04	27051887
Maneuvering	58438.67	7087.639	9186.241	1195.86	1100.191	3097277	25.59116	123.579	763754.6	2974.851	3134743
Hoteling	65921.04	2809.08	7562.16	1660.157	1527.344	6596024	56.1816	350.73	2057400	4022.34	6701946

		Emissions								
Parameter	Units	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	CO2e
Visit	(g/visit)	763363.63	34794.92	75921.56	10913.72	10040.62	36357289.13	571.90	1734.87	11114509.29
Annual Allo.	(g/yr)	17564289.22	800598.88	1746884.70	251114.55	231025.38	836547504.50	13158.86	39917.66	255734550.86
Avg. Day	(lb/day)	106.09	4.84	10.55	1.52	1.40	5052.80	0.08	0.24	
Annual	(tpy)	19.36	0.88	1.93	0.28	0.25	922.14	0.01	0.04	255.73 <- metric tons

Vessel Types	Operating Mode	Emissions (g/visit)											BSFC
		NOx	HC	ROG	CO	PM10	PM25	SO2	CO2	CH4	N2O	CO2e	(g/visit)
OGV	Transit	639,004	24,898	30,127	59,173	8,058	7,413	16,386	26,663,988	490	1,261	27,051,887	8,293,355
	Maneuvering	58,439	7,088	8,576	9,186	1,196	1,100	2,975	3,097,277	26	124	3,134,743	763,755
	Hoteling	65,921	2,809	3,399	7,562	1,660	1,527	4,022	6,596,024	56	351	6,701,946	2,057,400
Tugs	Maneuvering	61,461	926	1,121	15,030	1,802	1,748	45	4,845,338	19	2,370	5,551,914	1,518,915

Control for Visits

Annual Visits		1	
Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	0.85	85.5%	0.85
Visits w/ 2 stops	0.10	10.5%	0.10
Visits w/ 3 stops	0.04	3.6%	0.04
Visits w/4 stops	0.00	0.4%	0.00
			1.00

Vessel Types	Operating Mode	Emissions (annual avg lb/day)											BSFC
		NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b]	(lb/day)
OGV[c]	Transit[d]	3.55	0.14	0.17	0.33	0.04	0.04	0.09	148.23	0.00	0.01	150.38	46.10
	Maneuvering[e]	0.32	0.04	0.05	0.05	0.01	0.01	0.02	17.22	0.000	0.00	17.43	4.25
	Hoteling[f]	0.37	0.02	0.02	0.04	0.01	0.01	0.02	36.67	0.000	0.00	37.26	11.44
Tugs[g]	Maneuvering	0.37	0.01	0.01	0.09	0.01	0.01	0.000	29.27	0.000	0.01	33.53	9.17
TOTAL		**4.6**	**0.2**	**0.2**	**0.5**	**0.1**	**0.1**	**0.1**	**231.4**	**0.003**	**0.02**	**238.60**	**71.0**
BAAQMD Threshold		*54*	--	*54*	--	*82*	*54*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
CalEEMod background: http://www.aqmd.gov/docs/default-source/caleemod/02_appendix-a2016-3-2.pdf?sfvrsn=6
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c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
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Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf
Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
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d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
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Vessel Types	Operating Mode	Emissions (tons/year)										CO_2e[b]	BSFC
		NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	(metric tons)	(tons/year)
OGV[c]	Transit[d]	0.648	0.025	0.031	0.060	0.008	0.008	0.017	27.051	0.000	0.001	24.898	8.414
	Maneuvering[e]	0.059	0.007	0.009	0.009	0.001	0.001	0.003	3.142	0.0000	0.000	2.885	0.775
	Hoteling[f]	0.067	0.003	0.003	0.008	0.002	0.002	0.004	6.692	0.000	0.000	6.168	2.087
Tugs[g]	Maneuvering	0.068	0.001	0.001	0.017	0.002	0.002	0.000	5.341	0.0000	0.003	5.552	1.674
TOTAL		**0.8**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**42.2**	**0.001**	**0.00**	**39.50**	**13.0**
BAAQMD Threshold		*10*	--	*10*	--	*15*	*10*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

b - CO2e was calculated using the 100-year global warming potentials from the IPCC Forth Assessment Report (AR4) to remain consistent with the CalEEMod modeling and CARB's 2014 Scoping Plan Update.
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IPCC source: https://www.ipcc.ch/assessment-report/ar4/

c - The OGV emission calculations primarily relied upon EPA's 2020 port guidance document. The OGV fleet tier compistion, vessel transit speeds, and vessel transit distances leading to and from the Golden Gate were taken from the Port of Oakland 2017 Emission Inventory. Vehicle carrier propulsion power was taken from the 2005 Port of Benicia emission inventory. Allocation of the OGV emissions are based on 2020 San Francisco Marine Exchange berth report for vehicle carriers that demonstrated 85% of visits only make one stop in the bay, 10% make two stops, 4% make three stops, and less than a percent make 4 stops in the bay.
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d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
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e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
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f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

								Occurances	Low Load Adjustment									Emissions Per Visit (g)									
Leg	Mode	Speed (kt)	Distance (nm)	Duration (hr)	Engine	Power (kw)	Load	Per Visit	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	BSFC	SO2	CO2e
Open Ocean	Transit	19.082	8.7	0.455927052	Propulsion	11531	0.831	2	1	1	1	1	1	1	1	1	1	1	137967.9	5239.95	12226.55	1603.413	1475.14	5179778	104.799	253.2642	1615651	3158.695	5257871
Pilot Boarding	Transit	9	1.5	0.166666667	Propulsion	11531	0.087	2	1.35	2.95	2.45	1.61	1.61	1.38		1	1	1	7143.664	592.8685	1148.892	99.01033	91.0895	274157.1	4.019448	9.713665	61966.48	293.1786	277152.2
SF Bay Transit	Transit	13.5	52.8	3.911111111	Propulsion	11531	0.294	2	1	1	1	1	1	1		1	1	1	419094.9	15917.01	37139.7	4870.57	4480.924	15734232	318.3403	769.3223	4907746	9594.937	15971449
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28		1	1	9.54	22435.29	3897.856	4156.732	410.5307	377.6882	596702.3	3.680695	8.895013	56744.05	1058.349	599445
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28		1	1	9.54	12651.48	2198.039	2344.022	231.5023	212.9821	336486.2	2.07558	5.015985	31998.53	596.8132	338012.9
Open Ocean	Transit	19.082	8.7	0.455927052	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	8232.082	346.5046	952.8875	163.4046	150.3322	602659.8	6.930091	25.12158	187978.7	367.5097	610319.3
Pilot Boarding	Transit	9	1.5	0.166666667	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	3009.283	126.6667	348.3333	59.73344	54.95477	220305.6	2.533333	9.183333	68716.67	134.3452	223105.6
SF Bay Transit	Transit	15	52.8	3.52	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	63556.06	2675.2	7356.8	1261.57	1160.645	4652855	53.504	193.952	1451296	2837.371	4711690
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Auxiliary	1125	1	1	1	1	1	1	1	1		1	1	1	14218.86	598.5	1645.875	282.2405	259.6613	1040944	11.97	43.39125	324686.3	634.7811	1054174
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Auxiliary	1125	1	1	1	1	1	1	1	1		1	1	1	8018.156	337.5	928.125	159.1582	146.4255	586998.6	6.75	24.46875	183093.8	357.9593	594459
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	712.88	35.644	71.288	71.88931	66.13817	342824	0.71288	26.733	10693.2	209.0585	350808.2
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	402	20.1	40.2	40.53909	37.29596	193321.8	0.402	15.075	6030	117.8901	197824.2
Berth	Hoteling	0	0	8.1	Auxiliary	800	1	1	1	1	1	1	1	1		1	1	1	61579.44	2592	7128	1222.335	1124.548	4508149	51.84	187.92	1406160	2749.127	4565445
Berth	Hoteling	0	0	8.1	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	4341.6	217.08	434.16	437.8221	402.7964	2087875	4.3416	162.81	651240	1273.213	2136501

Annual Visits 1

Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	0.9	85.5%	1
Visits w/ 2 stops	0.1	10.5%	0
Visits w/ 3 stops	0.0	3.6%	0
Visits w/4 stops	0.0	0.4%	0

Mode Totals

Transit	639001.9	24898.2	59173.16	8057.702	7413.086	26663988	490.1261	1260.557	8293355	16386.04	27051887
Maneuvering	58438.67	7087.639	9186.241	1195.86	1100.191	3097277	25.59116	123.579	763754.6	2974.851	3134743
Hoteling	65921.04	2809.08	7562.16	1660.157	1527.344	6596024	56.1816	350.73	2057400	4022.34	6701946

		Emissions								
Parameter	Units	NOx	HC	CO	PM10	PM25	CO2	CH4	N2O	CO2e
Visit	(g/visit)	763363.63	34794.92	75921.56	10913.72	10040.62	36357289.13	571.90	1734.87	11114509.29
Annual Allo.	(g/yr)	702571.57	32023.96	69875.39	10044.58	9241.02	33461900.18	526.35	1596.71	10229382.03
Avg. Day	(lb/day)	4.24	0.19	0.42	0.06	0.06	202.11	0.00	0.01	
Annual	(tpy)	0.77	0.04	0.08	0.01	0.01	36.89	0.00	0.00	10.23

<- metric tons

Vessel Types	Operating Mode	Emissions (g/visit)											BSFC
		NOx	HC	ROG	CO	PM10	PM25	SO2	CO2	CH4	N2O	CO2e	(g/visit)
OGV	Transit	639,004	24,898	30,127	59,173	8,058	7,413	16,386	26,663,988	490	1,261	27,051,887	8,293,355
	Maneuvering	58,439	7,088	8,576	9,186	1,196	1,100	2,975	3,097,277	26	124	3,134,743	763,755
	Hoteling	65,921	2,809	3,399	7,562	1,660	1,527	4,022	6,596,024	56	351	6,701,946	2,057,400
Tugs	Maneuvering	61,461	926	1,121	15,030	1,802	1,748	45	4,845,338	19	2,370	5,551,914	1,518,915

Control for Visits

Annual Visits		8	
Visit Counts	Scaled Visits	Visit Allocations	Discrete Visits
Visits w/ 1 stop	6.84	85.5%	6.84
Visits w/ 2 stops	0.84	10.5%	0.84
Visits w/ 3 stops	0.29	3.6%	0.29
Visits w/4 stops	0.03	0.4%	0.03
			8.00

Vessel Types	Operating Mode	Emissions (annual avg lb/day)											BSFC
		NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	CO_2e[b]	(lb/day)
OGV[c]	Transit[d]	28.42	1.11	1.34	2.63	0.36	0.33	0.73	1185.81	0.02	0.06	1203.06	368.83
	Maneuvering[e]	2.60	0.32	0.38	0.41	0.05	0.05	0.13	137.74	0.001	0.01	139.41	33.97
	Hoteling[f]	2.93	0.12	0.15	0.34	0.07	0.07	0.18	293.34	0.002	0.02	298.05	91.50
Tugs[g]	Maneuvering	2.97	0.04	0.05	0.73	0.09	0.08	0.002	234.13	0.001	0.11	268.27	73.39
TOTAL		**36.9**	**1.6**	**1.9**	**4.1**	**0.6**	**0.5**	**1.0**	**1851.0**	**0.026**	**0.19**	**1908.79**	**567.7**
BAAQMD Threshold		*54*	--	*54*	--	*82*	*54*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
CARB Source: https://ww3.arb.ca.gov/msei/ordiesel/rog_tog_hcratio.xlsx

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Vessel Types	Operating Mode	Emissions (tons/year)										CO_2e[b]	BSFC
		NO_x	HC	ROG[a]	CO	PM_{10}	$PM_{2.5}$	SO_2	CO_2	CH_4	N_2O	(metric tons)	(tons/year)
OGV[c]	Transit[d]	5.186	0.202	0.245	0.480	0.065	0.060	0.133	216.411	0.004	0.010	199.180	67.311
	Maneuvering[e]	0.474	0.058	0.070	0.075	0.010	0.009	0.024	25.138	0.0002	0.001	23.081	6.199
	Hoteling[f]	0.535	0.023	0.028	0.061	0.013	0.012	0.033	53.535	0.000	0.003	49.346	16.698
Tugs[g]	Maneuvering	0.542	0.008	0.010	0.133	0.016	0.015	0.000	42.729	0.0002	0.021	44.415	13.395
TOTAL		**6.7**	**0.3**	**0.4**	**0.7**	**0.1**	**0.1**	**0.2**	**337.8**	**0.005**	**0.03**	**316.02**	**103.6**
BAAQMD Threshold		*10*	--	*10*	--	*15*	*10*	--	--	--	--	--	--

Notes:

a - ROG is calculated as hydrocarbons multiplied by 1.21
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Port of Benicia 2005 Emission Inventory: https://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/Port%20of%20Benicia%202005%20Emissions%20Inventory%20June%202010.ashx
San Francisco Marine Exchange (SFMX) Custom Berth Report: Acquired from James Hill of the SFMX by AMPORTS on May 13, 2021.

d - Transiting calculations assume per arrival/departure distances of 8.7 nautical miles (nm) of travel outside of pilot control at cruise speed, 1.5 nm during pilot boarding proceedures at 9 knots, 52.8 nm at 13.5 knots from the Golden Gate to Antioch.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

e - Maneuvering activity conservatively assumed the metrics used in the Port of Oakland 2017 emission inventory: 1.33 hours inbound and 0.75 hours outbound at a 2% engine load.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

f - The hoteling activity is modeled as 8.1 hours of operation which is a composite that assumes 6.5 hours for general vessel visit loading operations and an additional 8 hours in the vessel over nights (i.e., 14.5 hours for a visit with an overnight). Overnighting is assumed to occur 20% of the time.

g - The tug emissions were developed using EPA 2020 emission factors. Fleet information, engine loads, and maneuvering times were taken from the Port of Oakland 2017 Emission Inventory. The emission inventory provided a detailed fleet breakout and model year information for each tug. This information was used to identify EPA emission factors and average emission factors for the fleet were applied to determine the tug emissions.
Port of Oakland 2017 Emission Inventory: https://www.portofoakland.com/files/PDF/Port_Oakland_2017_Emissions_Inventory.pdf

								Occurances	Low Load Adjustment										Emissions Per Visit (g)									
Leg	**Mode**	**Speed (kt)**	**Distance (nm)**	**Duration (hr)**	**Engine**	**Power (kw)**	**Load**	**Per Visit**	**NOx**	**HC**	**CO**	**PM10**	**PM25**	**CO2**	**CH4**	**N2O**	**BSFC**	**SO2**	**NOx**	**HC**	**CO**	**PM10**	**PM25**	**CO2**	**CH4**	**N2O**	**BSFC**	**SO2**	**CO2e**
Open Ocean	Transit	19.082	8.7	0.455927052	Propulsion	11531	0.831	2	1	1	1	1	1	1	1	1	1	1	137967.9	5239.95	12226.55	1603.413	1475.14	5179778	104.799	253.2642	1615651	3158.695	5257871
Pilot Boarding	Transit	9	1.5	0.166666667	Propulsion	11531	0.087	2	1.35	2.95	2.45	1.61	1.61	1.38		1	1	2.42	7143.664	592.8685	1148.892	99.01033	91.0895	274157.1	4.019448	9.713665	61966.48	293.1786	277152.2
SF Bay Transit	Transit	13.5	52.8	3.911111111	Propulsion	11531	0.294	2	1	1	1	1	1	1		1	1	1	419094.9	15917.01	37139.7	4870.57	4480.924	15734232	318.3403	769.3223	4907746	9594.937	15971449
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28		1	1	9.54	22435.29	3897.856	4156.732	410.5307	377.6882	596702.3	3.680695	8.895013	56744.05	1058.349	599445
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Propulsion	11531	0.020	1	4.63	21.18	9.68	7.29	7.29	3.28		1	1	9.54	12651.48	2198.039	2344.022	231.5023	212.9821	336486.2	2.07558	5.015985	31998.53	596.8132	338012.9
Open Ocean	Transit	19.082	8.7	0.455927052	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	8232.082	346.5046	952.8875	163.4046	150.3322	602659.8	6.930091	25.12158	187978.7	367.5097	610319.3
Pilot Boarding	Transit	9	1.5	0.166666667	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	3009.283	126.6667	348.3333	59.73344	54.95477	220305.6	2.533333	9.183333	68716.67	134.3452	223105.6
SF Bay Transit	Transit	15	52.8	3.52	Auxiliary	950	1	2	1	1	1	1	1	1		1	1	1	63556.06	2675.2	7356.8	1261.57	1160.645	4652855	53.504	193.952	1451296	2837.371	4711690
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Auxiliary	1125	1	1	1	1	1	1	1	1		1	1	1	14218.86	598.5	1645.875	282.2405	259.6613	1040944	11.97	43.39125	324686.3	634.7811	1054174
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Auxiliary	1125	1	1	1	1	1	1	1	1		1	1	1	8018.156	337.5	928.125	159.1582	146.4255	586998.6	6.75	24.46875	183093.8	357.9593	594459
SF Bay Maneuver In	Maneuver	5.510267762		1.33	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	712.88	35.644	71.288	71.88931	66.13817	342824	0.71288	26.733	10693.2	209.0585	350808.2
SF Bay Maneuver Out	Maneuver	5.510267762		0.75	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	402	20.1	40.2	40.53909	37.29596	193321.8	0.402	15.075	6030.0	117.8901	197824.2
Berth	Hoteling	0	0	8.1	Auxiliary	800	1	1	1	1	1	1	1	1		1	1	1	61579.44	2592	7128	1222.335	1124.548	4508149	51.84	187.92	1406160	2749.127	4565445
Berth	Hoteling	0	0	8.1	Boiler	268	1	1	1	1	1	1	1	1		1	1	1	4341.6	217.08	434.16	437.8221	402.7964	2087875	4.3416	162.81	651240	1273.213	2136501

Annual Visits 8

Visit Counts	**Scaled Visits**	**Visit Allocations**	**Discrete Visits**
Visits w/ 1 stop	6.8	85.5%	7
Visits w/ 2 stops	0.8	10.5%	1
Visits w/ 3 stops	0.3	3.6%	0
Visits w/4 stops	0.0	0.4%	0

Mode Totals

Transit	639001.9	24898.2	59173.16	8057.702	7413.086	26663988	490.1261	1260.557	8293355	16386.04	27051887
Maneuvering	58438.67	7087.639	9186.241	1195.86	1100.191	3097277	25.59116	123.579	763754.6	2974.851	3134743
Hoteling	65921.04	2809.08	7562.16	1660.157	1527.344	6596024	56.1816	350.73	2057400	4022.34	6701946

		Emissions								
Parameter	**Units**	**NOx**	**HC**	**CO**	**PM10**	**PM25**	**CO2**	**CH4**	**N2O**	**CO2e**
Visit	(g/visit)	763363.63	34794.92	75921.56	10913.72	10040.62	36357289.13	571.90	1734.87	1111450929
Annual Allo.	(g/yr)	5620572.55	256191.64	559003.10	80356.66	73928.12	267695201.44	4210.84	12773.65	81835056.28
Avg. Day	(lb/day)	33.95	1.55	3.38	0.49	0.45	1616.90	0.03	0.08	
Annual	(tpy)	6.20	0.28	0.62	0.09	0.08	295.08	0.00	0.01	81.84 <- metrictons

Engine Group	Fuel Type	Tier	Engine Type	Pollutant	EF	Units	Source
Propulsion	MGO/MDO	Tier 0	SSD	NOx	17	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Tier I	SSD	NOx	16	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Tier II	SSD	NOx	14.4	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Tier III	SSD	NOx	3.4	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier 0	MSD	NOx	10.9	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier I	MSD	NOx	9.8	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier II	MSD	NOx	7.7	g/kWh	EPA 2020 Table 3.5
Auxiliary	MGO/MDO	Tier III	MSD	NOx	2	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	POAK Composite	SSD	NOx	15.798	g/kWh	Calculated based on POAK Fleet Composition
Auxiliary	MGO/MDO	POAK Composite	MSD	NOx	9.503	g/kWh	Calculated based on POAK Fleet Composition
Boiler	MGO/MDO	Any	Boiler	NOx	2	g/kWh	EPA 2020 Table 3.5
Propulsion	MGO/MDO	Any	SSD	BSFC	185	g/kWh	EPA 2020 Table 3.6
Auxiliary	MGO/MDO	Any	MSD	BSFC	217	g/kWh	EPA 2020 Table 3.6
Boiler	MGO/MDO	Any	Boiler	BSFC	300	g/kWh	EPA 2020 Table 3.6
Propulsion	Any	Any	SSD	HC	0.6	g/kWh	EPA 2020 Table 3.8
Auxiliary	Any	Any	MSD	HC	0.4	g/kWh	EPA 2020 Table 3.8
Boiler	Any	Any	Boiler	HC	0.1	g/kWh	EPA 2020 Table 3.8
Propulsion	Any	Any	SSD	CO	1.4	g/kWh	EPA 2020 Table 3.8
Auxiliary	Any	Any	MSD	CO	1.1	g/kWh	EPA 2020 Table 3.8
Boiler	Any	Any	Boiler	CO	0.2	g/kWh	EPA 2020 Table 3.8
Propulsion	MGO/MDO	Any	SSD	N2O	0.029	g/kWh	EPA 2020 Table 3.9
Auxiliary	MGO/MDO	Any	MSD	N2O	0.029	g/kWh	EPA 2020 Table 3.9
Boiler	MGO/MDO	Any	Boiler	N2O	0.075	g/kWh	EPA 2020 Table 3.9
Propulsion	MGO/MDO	Any	SSD	PM10	0.18359865	g/kWh	EPA 2020 Equation 3.3
Auxiliary	MGO/MDO	Any	MSD	PM10	0.18863193	g/kWh	EPA 2020 Equation 3.3
Boiler	MGO/MDO	Any	Boiler	PM10	0.201687	g/kWh	EPA 2020 Equation 3.3
Propulsion	MGO/MDO	Any	SSD	PM25	0.168910758	g/kWh	Calculated as 92% of PM10 per EPA 2020
Auxiliary	MGO/MDO	Any	MSD	PM25	0.173541376	g/kWh	Calculated as 92% of PM10 per EPA 2020
Boiler	MGO/MDO	Any	Boiler	PM25	0.18555204	g/kWh	Calculated as 92% of PM10 per EPA 2020
Propulsion	MGO/MDO	Any	SSD	CO2	593.11	g/kWh	EPA 2020 Equation 3.4
Auxiliary	MGO/MDO	Any	MSD	CO2	695.702	g/kWh	EPA 2020 Equation 3.4
Boiler	MGO/MDO	Any	Boiler	CO2	961.8	g/kWh	EPA 2020 Equation 3.4
Propulsion	MGO/MDO	Any	SSD	SO2	0.3616861	g/kWh	EPA 2020 Equation 3.5
Auxiliary	MGO/MDO	Any	MSD	SO2	0.42424802	g/kWh	EPA 2020 Equation 3.5
Boiler	MGO/MDO	Any	Boiler	SO2	0.586518	g/kWh	EPA 2020 Equation 3.5
Propulsion	Any	Any	SSD	CH4	0.012	g/kWh	Calculated as 2% of HC per EPA 2020
Auxiliary	Any	Any	MSD	CH4	0.008	g/kWh	Calculated as 2% of HC per EPA 2020
Boiler	Any	Any	Boiler	CH4	0.002	g/kWh	Calculated as 2% of HC per EPA 2020

Load	NOx	HC	CO	PM10	PM25	CO2	SO2
2%	4.63	21.18	9.68	7.29	7.29	3.28	9.54
3%	2.92	11.68	6.46	4.33	4.33	2.44	6.38
4%	2.21	7.71	4.86	3.09	3.09	2.01	4.79
5%	1.83	5.61	3.89	2.44	2.44	1.76	3.85
6%	1.6	4.35	3.25	2.04	2.04	1.59	3.21
7%	1.45	3.52	2.79	1.79	1.79	1.47	2.76
8%	1.35	2.95	2.45	1.61	1.61	1.38	2.42
9%	1.27	2.52	2.18	1.48	1.48	1.31	2.16
10%	1.22	2.2	1.96	1.38	1.38	1.25	1.95
11%	1.17	1.96	1.79	1.3	1.3	1.21	1.78
12%	1.14	1.76	1.64	1.24	1.24	1.17	1.63
13%	1.11	1.6	1.52	1.19	1.19	1.14	1.51
14%	1.08	1.47	1.41	1.15	1.15	1.11	1.41
15%	1.06	1.36	1.32	1.11	1.11	1.08	1.32
16%	1.05	1.26	1.24	1.08	1.08	1.06	1.24
17%	1.03	1.18	1.17	1.06	1.06	1.04	1.17
18%	1.02	1.11	1.11	1.04	1.04	1.03	1.11
19%	1.01	1.05	1.05	1.02	1.02	1.01	1.05
20%	1	1	1	1	1	1	1

Soure: EPA 2020

Load	Pollutant	Value
0.02	NOx	4.63
0.02	HC	21.18
0.02	CO	9.68
0.02	PM10	7.29
0.02	PM25	7.29
0.02	CO2	3.28
0.02	SO2	9.54
0.03	NOx	2.92
0.03	HC	11.68
0.03	CO	6.46
0.03	PM10	4.33
0.03	PM25	4.33
0.03	CO2	2.44
0.03	SO2	6.38
0.04	NOx	2.21
0.04	HC	7.71
0.04	CO	4.86
0.04	PM10	3.09
0.04	PM25	3.09
0.04	CO2	2.01
0.04	SO2	4.79
0.05	NOx	1.83
0.05	HC	5.61
0.05	CO	3.89
0.05	PM10	2.44
0.05	PM25	2.44
0.05	CO2	1.76
0.05	SO2	3.85
0.06	NOx	1.6
0.06	HC	4.35
0.06	CO	3.25
0.06	PM10	2.04
0.06	PM25	2.04
0.06	CO2	1.59
0.06	SO2	3.21
0.07	NOx	1.45
0.07	HC	3.52
0.07	CO	2.79
0.07	PM10	1.79
0.07	PM25	1.79
0.07	CO2	1.47
0.07	SO2	2.76
0.08	NOx	1.35
0.08	HC	2.95
0.08	CO	2.45
0.08	PM10	1.61

0.08	PM25	1.61
0.08	CO2	1.38
0.08	SO2	2.42
0.09	NOx	1.27
0.09	HC	2.52
0.09	CO	2.18
0.09	PM10	1.48
0.09	PM25	1.48
0.09	CO2	1.31
0.09	SO2	2.16
0.1	NOx	1.22
0.1	HC	2.2
0.1	CO	1.96
0.1	PM10	1.38
0.1	PM25	1.38
0.1	CO2	1.25
0.1	SO2	1.95
0.11	NOx	1.17
0.11	HC	1.96
0.11	CO	1.79
0.11	PM10	1.3
0.11	PM25	1.3
0.11	CO2	1.21
0.11	SO2	1.78
0.12	NOx	1.14
0.12	HC	1.76
0.12	CO	1.64
0.12	PM10	1.24
0.12	PM25	1.24
0.12	CO2	1.17
0.12	SO2	1.63
0.13	NOx	1.11
0.13	HC	1.6
0.13	CO	1.52
0.13	PM10	1.19
0.13	PM25	1.19
0.13	CO2	1.14
0.13	SO2	1.51
0.14	NOx	1.08
0.14	HC	1.47
0.14	CO	1.41
0.14	PM10	1.15
0.14	PM25	1.15
0.14	CO2	1.11
0.14	SO2	1.41
0.15	NOx	1.06
0.15	HC	1.36

0.15	CO	1.32
0.15	PM10	1.11
0.15	PM25	1.11
0.15	CO2	1.08
0.15	SO2	1.32
0.16	NOx	1.05
0.16	HC	1.26
0.16	CO	1.24
0.16	PM10	1.08
0.16	PM25	1.08
0.16	CO2	1.06
0.16	SO2	1.24
0.17	NOx	1.03
0.17	HC	1.18
0.17	CO	1.17
0.17	PM10	1.06
0.17	PM25	1.06
0.17	CO2	1.04
0.17	SO2	1.17
0.18	NOx	1.02
0.18	HC	1.11
0.18	CO	1.11
0.18	PM10	1.04
0.18	PM25	1.04
0.18	CO2	1.03
0.18	SO2	1.11
0.19	NOx	1.01
0.19	HC	1.05
0.19	CO	1.05
0.19	PM10	1.02
0.19	PM25	1.02
0.19	CO2	1.01
0.19	SO2	1.05
0.2	NOx	1
0.2	HC	1
0.2	CO	1
0.2	PM10	1
0.2	PM25	1
0.2	CO2	1
0.2	SO2	1

Parameter	Value	Source
Tugs Per Visit	2	Typical based on SFMX data sample for April 2020
Maneuver Time In	1.33	POAK 2017 EI
Maneuver Time Out	0.75	POAK 2017 EI
Load Propulsion	0.31	POAK 2005, 2012, 2015, and 2017 Eis and POLA 2011 EI
Load Auxiliary	0.43	POAK 2005, 2012, 2015, and 2017 Eis and POLA 2011 EI

Mode	Nox	PM10	PM25	BC	HC	VOC	CH4	CO	CO2	N2O	BSFC	SO2	CO2e
Propulsion In	37743.32	1119.80	1086.21	836.38	545.30	574.20	10.91	9405.25	2958603.08	1446.84	927461.78	27.20	3390034.2
Propulsion Out	21283.83	631.47	612.52	471.64	307.50	323.80	6.15	5303.71	1668385.20	815.89	523004.76	15.34	1911673.4
Auxiliary In	1556.35	28.38	27.53	21.20	41.16	43.34	0.82	180.05	122516.96	59.91	38406.57	1.13	140391.98
Auxiliary Out	877.64	22.20	21.54	16.58	32.19	33.90	0.64	140.84	95832.45	46.86	30041.52	0.88	109814.25
TOTAL (g/visit)	61461.13	1801.86	1747.80	1345.81	926.15	975.23	18.52	15029.84	4845337.69	2369.51	1518914.64	44.54	5551913.80
Avg Daily (lb/day)	2.97	0.09	0.08	0.07	0.04	0.05	0.00	0.73	234.13	0.11	73.39	0.002	
Annual (tpy)	0.54	0.02	0.02	0.01	0.01	0.01	0.00	0.13	42.73	0.02	13.39	0.000	44.415 MTCO2e

Name	ModelYr	Attribute	Value	Engine	NOx (g/kWh)	PM10 & DPM10 (g/kWh)	PM2.5 & DPM2.5 (g/kWh)	BC (g/kWh)	HC (g/kWh)	VOC (g/kWh)	CH4 (g/kWh)	CO (g/kWh)
AMNAV Maritime Services Patricia Ann	2008	PropPow	5080	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
AMNAV Maritime Services Patricia Ann	2008	AuxPow	210	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
AMNAV Maritime Services Revolution	2006	PropPow	5080	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
AMNAV Maritime Services Revolution	2006	AuxPow	210	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
AMNAV Maritime Services Sandra Hughes	2006	PropPow	5080	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
AMNAV Maritime Services Sandra Hughes	2006	AuxPow	210	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
AMNAV Maritime Services Liberty	2008	PropPow	3300	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
AMNAV Maritime Services Liberty	2008	AuxPow	210	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
AMNAV Maritime Services Patriot	2006	PropPow	4300	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
AMNAV Maritime Services Patriot	2006	AuxPow	210	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
BayDelta Delta Billie	2009	PropPow	6712	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
BayDelta Delta Billie	2009	AuxPow	215	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
BayDelta Delta Cathryn	2009	PropPow	6712	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
BayDelta Delta Cathryn	2009	AuxPow	215	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
BayDelta Delta Audrey	2014	PropPow	6712	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
BayDelta Delta Audrey	2014	AuxPow	215	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
Crowley (BayDelta) Valor	2007	PropPow	6772	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Crowley (BayDelta) Valor	2007	AuxPow	215	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
Crowley (BayDelta) Goliah	2013	PropPow	5150	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Crowley (BayDelta) Goliah	2013	AuxPow	215	Auxiliary	5.66128332	0.127551538	0.123724992	0.095268244	0.196412337	0.206822191	0.003928247	0.929874671
Foss (AMNAV) Keegan Foss	1998	PropPow	3900	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Keegan Foss	1998	AuxPow	198	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
Foss (AMNAV) Pacific Star	2008	PropPow	6610	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Foss (AMNAV) Pacific Star	2008	AuxPow	198	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
Foss (AMNAV) Caden Foss	2017	PropPow	6772	Propulsion	1.3	0.046121522	0.044737876	0.034448165	0.017756956	0.018698075	0.000355139	2
Foss (AMNAV) Caden Foss	2017	AuxPow	365	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
Foss (AMNAV) America	2008	PropPow	6610	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Foss (AMNAV) America	2008	AuxPow	198	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
Foss (AMNAV) Lynn Marie	2001	PropPow	6250	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Lynn Marie	2001	AuxPow	210	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
Foss (AMNAV) Point Fermin	2006	PropPow	3500	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Point Fermin	2006	AuxPow	198	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
Foss (AMNAV) Point Vicente	2006	PropPow	3500	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
Foss (AMNAV) Point Vicente	2006	AuxPow	198	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
Starlight Marine Services Ahbra Franco	2013	PropPow	6850	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Ahbra Franco	2013	AuxPow	290	Auxiliary	5.66128332	0.127551538	0.123724992	0.095268244	0.196412337	0.206822191	0.003928247	0.929874671
Starlight Marine Services Z-3	2012	PropPow	4000	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Z-3	2012	AuxPow	204	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671
Starlight Marine Services Z-4	2012	PropPow	4000	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Z-4	2012	AuxPow	204	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671
Starlight Marine Services Z-5	2012	PropPow	4000	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
Starlight Marine Services Z-5	2012	AuxPow	204	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671

Engine	EnginePow	NOx (g/kWh)	PM10 & DPM10 (g/kWh)	PM2.5 & DPM2.5 (g/kWh)	BC (g/kWh)	HC (g/kWh)	VOC (g/kWh)	CH4 (g/kWh)	CO (g/kWh)	CO2	N2O	BSFC	SO2
Auxiliary	218.6666667	6.222623422	0.15741966	0.15269707	0.117576744	0.228263739	0.240361717	0.004565275	0.998551953	679.47	0.33228	213	0.00625
Propulsion	5280.47619	8.668095238	0.25717257	0.249457393	0.192082193	0.125232308	0.131869621	0.002504646	2.16	679.47	0.33228	213	0.00625

Name	ModelYr	PropPow	AuxPow	Tier
AMNAV Maritime Services Patricia Ann	2008	5,080	210	Tier 2
AMNAV Maritime Services Revolution	2006	5,080	210	Tier 1
AMNAV Maritime Services Sandra Hughes	2006	5,080	210	Tier 1
AMNAV Maritime Services Liberty	2008	3,300	210	Tier 2
AMNAV Maritime Services Patriot	2006	4,300	210	Tier 1
BayDelta Delta Billie	2009	6,712	215	Tier 2
BayDelta Delta Cathryn	2009	6,712	215	Tier 2
BayDelta Delta Audrey	2014	6,712	215	Tier 3
Crowley (BayDelta) Valor	2007	6,772	215	Tier 1
Crowley (BayDelta) Goliah	2013	5,150	215	Tier 3
Foss (AMNAV) Keegan Foss	1998	3,900	198	Tier 2 Low NOx EMD
Foss (AMNAV) Pacific Star	2008	6,610	198	Tier 1
Foss (AMNAV) Caden Foss	2017	6,772	365	Tier 4
Foss (AMNAV) America	2008	6,610	198	Tier 2 Low NOx EMD
Foss (AMNAV) Lynn Marie	2001	6,250	210	Tier 1
Foss (AMNAV) Point Fermin	2006	3,500	198	Bunkering, Tier 1
Foss (AMNAV) Point Vicente	2006	3,500	198	Bunkering, Tier 1
Starlight Marine Services Ahbra Franco	2013	6,850	290	Tier 3
Starlight Marine Services Z-3	2012	4,000	204	Tier 2
Starlight Marine Services Z-4	2012	4,000	204	Tier 2
Starlight Marine Services Z-5	2012	4,000	204	Tier 2

Source: POAK 2017 Emission Inventory

Year Range	Model Year Min Inclusive	Model Year Max Inclusive	Power Range (kW)	Power Min (kW)	Power Max Inclusive (kW)	Engine Group	NOx (g/kWh)	PM10 & DPM10 (g/kWh)	PM2.5 & DPM2.5 (g/kWh)	BC (g/kWh)	HC (g/kWh)	VOC (g/kWh)	CH4 (g/kWh)	CO (g/kWh)
1998	0	1998	0 < kW ≤ 8	0	8	All	13.4102	1.212787437	1.176403814	0.905830937	2.01153	2.11814109	0.0402306	5
1998	0	1998	8 < kW ≤ 19	8	19	All	11.39867	1.078685437	1.046324874	0.805670153	2.279734	2.400559902	0.04559468	5
1998	0	1998	19 < kW ≤ 37	19	37	All	9.253038	0.944583437	0.916245934	0.705509369	2.413836	2.541769308	0.04827672	5
1998	0	1998	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.619594494
1998	0	1998	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
1998	0	1998	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
1998	0	1998	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
1998	0	1998	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
1998	0	1998	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
1998	0	1998	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
1998	0	1998	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
1998	0	1998	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
1998	0	1998	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
1999	1999	1999	0 < kW ≤ 8	0	8	All	13.4102	1.212787437	1.176403814	0.905830937	2.01153	2.11814109	0.0402306	5
1999	1999	1999	8 < kW ≤ 19	8	19	All	11.39867	1.078685437	1.046324874	0.805670153	2.279734	2.400559902	0.04559468	5
1999	1999	1999	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
1999	1999	1999	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
1999	1999	1999	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
1999	1999	1999	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
1999	1999	1999	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
1999	1999	1999	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
1999	1999	1999	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
1999	1999	1999	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
1999	1999	1999	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
1999	1999	1999	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
1999	1999	1999	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2000	2000	2000	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2000	2000	2000	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2000	2000	2000	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2000	2000	2000	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2000	2000	2000	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2000	2000	2000	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2000	2000	2000	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2000	2000	2000	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2000	2000	2000	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2000	2000	2000	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2000	2000	2000	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2000	2000	2000	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2000	2000	2000	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2001	2001	2001	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2001	2001	2001	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2001	2001	2001	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2001	2001	2001	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2001	2001	2001	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2001	2001	2001	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2001	2001	2001	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2001	2001	2001	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2001	2001	2001	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2001	2001	2001	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2001	2001	2001	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2001	2001	2001	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2001	2001	2001	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2002	2002	2002	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2002	2002	2002	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2002	2002	2002	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2002	2002	2002	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2002	2002	2002	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2002	2002	2002	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2002	2002	2002	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2002	2002	2002	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2002	2002	2002	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2002	2002	2002	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2002	2002	2002	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2002	2002	2002	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2002	2002	2002	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2003	2003	2003	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2003	2003	2003	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2003	2003	2003	19 < kW ≤ 37	19	37	All	6.3430246	0.327714237	0.31788281	0.244769764	0.3754856	0.395386337	0.007509712	1.53
2003	2003	2003	37 < kW ≤ 600	37	600	Propulsion	10.07572974	0.242182876	0.23491739	0.18088639	0.274411656	0.288955474	0.005488233	1.61959494
2003	2003	2003	37 < kW ≤ 600	37	600	Auxiliary	10.08055009	0.291669047	0.282918976	0.217847611	0.287121677	0.302339125	0.005742434	1.569098173
2003	2003	2003	600 < kW ≤ 1000	600	1000	Propulsion	10.24709501	0.207585212	0.201357656	0.155045395	0.266425092	0.280545622	0.005328502	1.654886508
2003	2003	2003	600 < kW ≤ 1000	600	1000	Auxiliary	10.40635063	0.211946637	0.205588238	0.158302943	0.27	0.28431	0.0054	1.621905189
2003	2003	2003	1000 < kW ≤ 1400	1000	1400	Propulsion	10.45348733	0.217246941	0.210729533	0.162261741	0.257304406	0.27094154	0.005146088	1.710114255
2003	2003	2003	1000 < kW ≤ 1400	1000	1400	Auxiliary	10.94720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2003	2003	2003	1400 < kW ≤ 2000	1400	2000	Propulsion	11.79937468	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2003	2003	2003	1400 < kW ≤ 2000	1400	2000	Auxiliary	11	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2003	2003	2003	2000 < kW ≤ 3700	2000	3700	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2003	2003	2003	3700 < kW ≤ 999999	3700	999999	Propulsion	13.36	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2004	2004	2004	0 < kW ≤ 8	0	8	All	7.0135346	0.475226437	0.460969644	0.354946626	1.0191752	1.073191486	0.020383504	4.11
2004	2004	2004	8 < kW ≤ 19	8	19	All	5.9541288	0.233842837	0.226827552	0.174657215	0.5900488	0.621321386	0.011800976	2.16
2004	2004	2004	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2004	2004	2004	37 < kW ≤ 600	37	600	Propulsion	6.502347948	0.131122321	0.127188652	0.097935262	0.215258229	0.226666916	0.004305165	1.169448359
2004	2004	2004	37 < kW ≤ 600	37	600	Auxiliary	6.373213802	0.190053452	0.184351848	0.141950923	0.243423433	0.256324875	0.004868469	0.988800476
2004	2004	2004	600 < kW ≤ 1000	600	1000	Propulsion	7.827495235	0.160016676	0.155216176	0.119516456	0.232192912	0.244499137	0.004643858	1.440935384
2004	2004	2004	600 < kW ≤ 1000	600	1000	Auxiliary	7.621097743	0.165769504	0.160796419	0.123813243	0.239609254	0.252308544	0.004792185	1.317997725
2004	2004	2004	1000 < kW ≤ 1400	1000	1400	Propulsion	7.278008591	0.146554449	0.142157816	0.109461518	0.206431323	0.217372183	0.004128626	1.392157483
2004	2004	2004	1000 < kW ≤ 1400	1000	1400	Auxiliary	9.194720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2004	2004	2004	1400 < kW ≤ 2000	1400	2000	Propulsion	9.657269415	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2004	2004	2004	1400 < kW ≤ 2000	1400	2000	Auxiliary	9.2	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2004	2004	2004	2000 < kW ≤ 3700	2000	3700	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2004	2004	2004	3700 < kW ≤ 999999	3700	999999	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2005	2005	2005	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2005	2005	2005	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2005	2005	2005	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2005	2005	2005	37 < kW ≤ 600	37	600	Propulsion	6.456221024	0.128746596	0.124884198	0.096160832	0.215258229	0.226666916	0.004305165	1.169448359
2005	2005	2005	37 < kW ≤ 600	37	600	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
2005	2005	2005	600 < kW ≤ 1000	600	1000	Propulsion	7.827495235	0.160016676	0.155216176	0.119516456	0.232192912	0.244499137	0.004643858	1.440935384
2005	2005	2005	600 < kW ≤ 1000	600	1000	Auxiliary	7.621097743	0.165769504	0.160796419	0.123813243	0.239609254	0.252308544	0.004792185	1.317997725
2005	2005	2005	1000 < kW ≤ 1400	1000	1400	Propulsion	7.278008591	0.146554449	0.142157816	0.109461518	0.206431323	0.217372183	0.004128626	1.392157483
2005	2005	2005	1000 < kW ≤ 1400	1000	1400	Auxiliary	9.194720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2005	2005	2005	1400 < kW ≤ 2000	1400	2000	Propulsion	9.657269415	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2005	2005	2005	1400 < kW ≤ 2000	1400	2000	Auxiliary	9.2	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2005	2005	2005	2000 < kW ≤ 3700	2000	3700	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2005	2005	2005	3700 < kW ≤ 999999	3700	999999	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2006	2006	2006	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2006	2006	2006	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2006	2006	2006	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2006	2006	2006	37 < kW ≤ 600	37	600	Propulsion	6.456221024	0.128746596	0.124884198	0.096160832	0.215258229	0.226666916	0.004305165	1.169448359
2006	2006	2006	37 < kW ≤ 600	37	600	Auxiliary	6.104964927	0.156609567	0.15191128	0.116971686	0.243423433	0.256324875	0.004868469	0.962629855
2006	2006	2006	600 < kW ≤ 1000	600	1000	Propulsion	7.827495235	0.160016676	0.155216176	0.119516456	0.232192912	0.244499137	0.004643858	1.440935384
2006	2006	2006	600 < kW ≤ 1000	600	1000	Auxiliary	7.621097743	0.165769504	0.160796419	0.123813243	0.239609254	0.252308544	0.004792185	1.317997725
2006	2006	2006	1000 < kW ≤ 1400	1000	1400	Propulsion	7.278008591	0.146554449	0.142157816	0.109461518	0.206431323	0.217372183	0.004128626	1.392157483
2006	2006	2006	1000 < kW ≤ 1400	1000	1400	Auxiliary	9.194720285	0.190999344	0.185269363	0.14265741	0.27	0.28431	0.0054	1.784160855
2006	2006	2006	1400 < kW ≤ 2000	1400	2000	Propulsion	9.657269415	0.196717762	0.190816229	0.146928497	0.22393434	0.23580286	0.004478687	2.030328298
2006	2006	2006	1400 < kW ≤ 2000	1400	2000	Auxiliary	9.2	0.189943401	0.184245099	0.141868726	0.27	0.28431	0.0054	1.8
2006	2006	2006	2000 < kW ≤ 3700	2000	3700	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2006	2006	2006	3700 < kW ≤ 999999	3700	999999	Propulsion	10.55	0.209943401	0.203645099	0.156806726	0.134	0.141102	0.00268	2.48
2007	2007	2007	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2007	2007	2007	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2007	2007	2007	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2007	2007	2007	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122863494	0.119131999	0.091731639	0.206215721	0.217145154	0.004142314	1.101893496
2007	2007	2007	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
2007	2007	2007	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2007	2007	2007	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2007	2007	2007	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2007	2007	2007	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2007	2007	2007	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2007	2007	2007	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2007	2007	2007	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2007	2007	2007	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2008	2008	2008	0 < kW ≤ 8	0	8	All	5.8870778	0.496510611	0.481615293	0.370843775	0.9118936	0.960223961	0.018237872	4.11
2008	2008	2008	8 < kW ≤ 19	8	19	All	4.8679026	0.241716811	0.234465307	0.180538286	0.2816142	0.296539753	0.005632284	2.16
2008	2008	2008	19 < kW ≤ 37	19	37	All	4.9751842	0.295357611	0.286496883	0.2206026	0.7241508	0.762530792	0.014483016	1.53
2008	2008	2008	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122816494	0.119131999	0.091731639	0.206215721	0.217145154	0.004142314	1.101893496
2008	2008	2008	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.153565047	0.148958096	0.114697734	0.240601621	0.253353506	0.004812032	0.929874671
2008	2008	2008	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2008	2008	2008	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2008	2008	2008	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2008	2008	2008	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2008	2008	2008	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2008	2008	2008	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2008	2008	2008	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2008	2008	2008	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2009	2009	2009	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2009	2009	2009	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2009	2009	2009	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2009	2009	2009	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122653676	0.118974066	0.09161003	0.205848537	0.21675851	0.004116971	1.101893496

2009	2009	2009	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
2009	2009	2009	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2009	2009	2009	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2009	2009	2009	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2009	2009	2009	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2009	2009	2009	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2009	2009	2009	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2009	2009	2009	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2009	2009	2009	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2010	2010	2010	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2010	2010	2010	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2010	2010	2010	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2010	2010	2010	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122653676	0.118974066	0.09161003	0.205848537	0.21675851	0.004116971	1.101893496
2010	2010	2010	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
2010	2010	2010	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2010	2010	2010	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2010	2010	2010	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2010	2010	2010	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2010	2010	2010	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2010	2010	2010	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2010	2010	2010	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2010	2010	2010	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2011	2011	2011	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2011	2011	2011	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2011	2011	2011	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2011	2011	2011	37 < kW ≤ 600	37	600	Propulsion	6.057953233	0.122653676	0.118974066	0.09161003	0.205848537	0.21675851	0.004116971	1.101893496
2011	2011	2011	37 < kW ≤ 600	37	600	Auxiliary	5.962361954	0.150993805	0.146463991	0.112777273	0.234803004	0.247247564	0.00469606	0.929874671
2011	2011	2011	600 < kW ≤ 1000	600	1000	Propulsion	6.061246584	0.123770929	0.120057801	0.092444507	0.188527979	0.198519962	0.00377056	1.123657479
2011	2011	2011	600 < kW ≤ 1000	600	1000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2011	2011	2011	1000 < kW ≤ 1400	1000	1400	Propulsion	6.217505389	0.136513063	0.132417671	0.101961607	0.184772403	0.19456534	0.003695448	1.184014957
2011	2011	2011	1000 < kW ≤ 1400	1000	1400	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2011	2011	2011	1400 < kW ≤ 2000	1400	2000	Propulsion	6.789213139	0.183133008	0.177639018	0.136782044	0.171031787	0.180096472	0.003420636	1.404846277
2011	2011	2011	1400 < kW ≤ 2000	1400	2000	Auxiliary	6.1	0.138776572	0.134613275	0.103652222	0.21	0.22113	0.0042	0.9
2011	2011	2011	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2011	2011	2011	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2012	2012	2012	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2012	2012	2012	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2012	2012	2012	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2012	2012	2012	37 < kW ≤ 600	37	600	Propulsion	6.040540037	0.12136727	0.117726252	0.090649214	0.203364655	0.214142981	0.004067293	1.101893496
2012	2012	2012	37 < kW ≤ 600	37	600	Auxiliary	5.923469261	0.148340787	0.143890563	0.110795734	0.229858448	0.242040946	0.004597169	0.929874671
2012	2012	2012	600 < kW ≤ 1000	600	1000	Propulsion	5.87230514	0.116026489	0.112545694	0.086660185	0.174238341	0.183472973	0.00348767	1.123657479
2012	2012	2012	600 < kW ≤ 1000	600	1000	Auxiliary	5.608315737	0.114892675	0.111445895	0.085813339	0.169364937	0.178341279	0.003387299	0.9
2012	2012	2012	1000 < kW ≤ 1400	1000	1400	Propulsion	6.051105922	0.129692563	0.125801786	0.096867375	0.172187569	0.18131351	0.003443751	1.184014957
2012	2012	2012	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.953884551	0.083103235	0.080610138	0.062069807	0.115279715	0.12138954	0.002305594	0.9
2012	2012	2012	1400 < kW ≤ 2000	1400	2000	Propulsion	6.00228766	0.150877943	0.146351605	0.112690736	0.111516415	0.117426785	0.002230328	1.404846277
2012	2012	2012	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2012	2012	2012	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2012	2012	2012	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2013	2013	2013	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2013	2013	2013	8 < kW ≤ 19	8	19	All	3.63	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2013	2013	2013	19 < kW ≤ 37	19	37	All	3.71	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2013	2013	2013	37 < kW ≤ 600	37	600	Propulsion	5.667787332	0.105036552	0.101885455	0.0784518	0.170337356	0.179365236	0.003406747	1.101893496
2013	2013	2013	37 < kW ≤ 600	37	600	Auxiliary	5.66128332	0.127551538	0.123724992	0.095268244	0.196412337	0.206822191	0.003928247	0.929874671
2013	2013	2013	600 < kW ≤ 1000	600	1000	Propulsion	5.303250987	0.091923048	0.089165357	0.068657325	0.13772262	0.145021919	0.002754452	1.123657479
2013	2013	2013	600 < kW ≤ 1000	600	1000	Auxiliary	5.492423621	0.109771065	0.106477933	0.081988008	0.160651244	0.16916576	0.003213025	0.9
2013	2013	2013	1000 < kW ≤ 1400	1000	1400	Propulsion	5.659314461	0.104751681	0.101609131	0.07823903	0.15443172	0.162616602	0.003088634	1.184014957
2013	2013	2013	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2013	2013	2013	1400 < kW ≤ 2000	1400	2000	Propulsion	5.397782	0.099962027	0.096963166	0.074661638	0.095123041	0.100164562	0.001902461	1.404846277
2013	2013	2013	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2013	2013	2013	2000 < kW ≤ 3700	2000	3700	Propulsion	8.33	0.185168125	0.179613081	0.138302073	0.134	0.141102	0.00268	2
2013	2013	2013	3700 < kW ≤ 999999	3700	999999	Propulsion	8.33	0.308776572	0.299513275	0.230625222	0.134	0.141102	0.00268	2
2014	2014	2014	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2014	2014	2014	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2014	2014	2014	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2014	2014	2014	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2014	2014	2014	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2014	2014	2014	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2014	2014	2014	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2014	2014	2014	1000 < kW ≤ 1400	1000	1400	Propulsion	4.826267717	0.073733998	0.071521978	0.055071923	0.097199501	0.102351075	0.00194399	1.184014957
2014	2014	2014	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2014	2014	2014	1400 < kW ≤ 2000	1400	2000	Propulsion	5.268970274	0.099237331	0.096260211	0.074120363	0.09148989	0.096338854	0.001829798	1.404846277
2014	2014	2014	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2014	2014	2014	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.181849231	0.176393754	0.13582319	0.016218462	0.01707804	0.000324369	2
2014	2014	2014	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
2015	2015	2015	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2015	2015	2015	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2015	2015	2015	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2015	2015	2015	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2015	2015	2015	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2015	2015	2015	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2015	2015	2015	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2015	2015	2015	1000 < kW ≤ 1400	1000	1400	Propulsion	4.826267717	0.073733998	0.071521978	0.055071923	0.097199501	0.102351075	0.00194399	1.184014957
2015	2015	2015	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2015	2015	2015	1400 < kW ≤ 2000	1400	2000	Propulsion	5.268970274	0.099237331	0.096260211	0.074120363	0.09148989	0.096338854	0.001829798	1.404846277
2015	2015	2015	1400 < kW ≤ 2000	1400	2000	Auxiliary	4.89	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2015	2015	2015	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.181849231	0.176393754	0.13582319	0.016218462	0.01707804	0.000324369	2
2015	2015	2015	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
2016	2016	2016	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2016	2016	2016	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2016	2016	2016	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2016	2016	2016	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2016	2016	2016	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2016	2016	2016	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2016	2016	2016	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2016	2016	2016	1000 < kW ≤ 1400	1000	1400	Propulsion	4.826267717	0.073733998	0.071521978	0.055071923	0.097199501	0.102351075	0.00194399	1.184014957
2016	2016	2016	1000 < kW ≤ 1400	1000	1400	Auxiliary	4.883664342	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2016	2016	2016	1400 < kW ≤ 2000	1400	2000	Propulsion	1.3	0.030825716	0.029900945	0.023023727	0.032399922	0.034117118	0.000647998	1.404846277
2016	2016	2016	1400 < kW ≤ 2000	1400	2000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2016	2016	2016	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.033781538	0.032768092	0.025231431	0.016218462	0.01707804	0.000324369	2
2016	2016	2016	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.179579784	0.174192391	0.134128141	0.066121522	0.069625963	0.00132243	2
2017	2017	2017	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2017	2017	2017	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2017	2017	2017	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2017	2017	2017	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.068970284	0.066901176	0.051513905	0.103789751	0.109290608	0.002075795	1.101893496
2017	2017	2017	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.084744322	0.082201993	0.063295534	0.123581931	0.130131773	0.002471639	0.929874671
2017	2017	2017	600 < kW ≤ 1000	600	1000	Propulsion	4.742699043	0.071051443	0.0689199	0.053068323	0.099211417	0.104469622	0.001984228	1.123657479
2017	2017	2017	600 < kW ≤ 1000	600	1000	Auxiliary	4.818762076	0.08	0.0776	0.059752	0.11	0.11583	0.0022	0.9
2017	2017	2017	1000 < kW ≤ 1400	1000	1400	Propulsion	1.3	0.03	0.0291	0.022407	0.038133001	0.04015405	0.00076266	1.184014957
2017	2017	2017	1000 < kW ≤ 1400	1000	1400	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2017	2017	2017	1400 < kW ≤ 2000	1400	2000	Propulsion	1.3	0.030825716	0.029900945	0.023023727	0.032399922	0.034117118	0.000647998	1.404846277
2017	2017	2017	1400 < kW ≤ 2000	1400	2000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2017	2017	2017	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.033781538	0.032768092	0.025231431	0.016218462	0.01707804	0.000324369	2
2017	2017	2017	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.046121522	0.044737876	0.034448165	0.017756956	0.018698075	0.000355139	2
2018+	2018	9999	0 < kW ≤ 8	0	8	All	4.39	0.24	0.2328	0.179256	0.43	0.45279	0.0086	4.11
2018+	2018	9999	8 < kW ≤ 19	8	19	All	2.32	0.19	0.1843	0.141911	0.21	0.22113	0.0042	2.16
2018+	2018	9999	19 < kW ≤ 37	19	37	All	2.32	0.18	0.1746	0.134442	0.41	0.43173	0.0082	1.53
2018+	2018	9999	37 < kW ≤ 600	37	600	Propulsion	4.69200658	0.061298242	0.059459294	0.045783657	0.103789751	0.109290608	0.002075795	1.101893496
2018+	2018	9999	37 < kW ≤ 600	37	600	Auxiliary	4.579829478	0.07699098	0.07468125	0.057504563	0.123581931	0.130131773	0.002471639	0.929874671
2018+	2018	9999	600 < kW ≤ 1000	600	1000	Propulsion	1.3	0.03	0.0291	0.022407	0.039474278	0.041566415	0.000789486	1.123657479
2018+	2018	9999	600 < kW ≤ 1000	600	1000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2018+	2018	9999	1000 < kW ≤ 1400	1000	1400	Propulsion	1.3	0.03	0.0291	0.022407	0.038133001	0.04015405	0.00076266	1.184014957
2018+	2018	9999	1000 < kW ≤ 1400	1000	1400	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2018+	2018	9999	1400 < kW ≤ 2000	1400	2000	Propulsion	1.3	0.030825716	0.029900945	0.023023727	0.032399922	0.034117118	0.000647998	1.404846277
2018+	2018	9999	1400 < kW ≤ 2000	1400	2000	Auxiliary	1.3	0.03	0.0291	0.022407	0.04	0.04212	0.0008	0.9
2018+	2018	9999	2000 < kW ≤ 3700	2000	3700	Propulsion	1.3	0.033781538	0.032768092	0.025231431	0.016218462	0.01707804	0.000324369	2
2018+	2018	9999	3700 < kW ≤ 999999	3700	999999	Propulsion	1.3	0.046121522	0.044737876	0.034448165	0.017756956	0.018698075	0.000355139	2

Wharf Construction - Contra Costa County, Annual

Wharf Construction

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	1.00	User Defined Unit	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Applicant provided schedule

Off-road Equipment - No offroad construction equipment

Off-road Equipment - Applicant provided information

Off-road Equipment -

Off-road Equipment - No offroad construction equipment

Off-road Equipment - No offroad construction equipment

Off-road Equipment - No offroad construction equipment

Trips and VMT - estimated workers for wharf construction. Total average for all construction is 24, accounted for in landside construction modeling.
Applicant provided vendor and haul trips to account for demo material

Table Name	Column Name	Default Value	New Value
tblArchitecturalCoating	PhaseName	Architectural Coating	Punch List and Final Completion
tblConstructionPhase	NumDays	0.00	10.00
tblConstructionPhase	NumDays	0.00	70.00
tblConstructionPhase	NumDays	0.00	1.00
tblConstructionPhase	NumDays	0.00	3.00
tblConstructionPhase	NumDays	0.00	76.00
tblConstructionPhase	NumDays	0.00	62.00
tblConstructionPhase	PhaseEndDate	9/2/2021	4/12/2022
tblConstructionPhase	PhaseEndDate	9/2/2021	2/8/2022
tblConstructionPhase	PhaseEndDate	9/2/2021	9/1/2021
tblConstructionPhase	PhaseEndDate	9/2/2021	9/7/2021
tblConstructionPhase	PhaseEndDate	9/2/2021	3/15/2022
tblConstructionPhase	PhaseEndDate	9/2/2021	11/30/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	3/30/2022
tblConstructionPhase	PhaseStartDate	9/3/2021	11/3/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	9/1/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	11/30/2021
tblConstructionPhase	PhaseStartDate	9/3/2021	9/6/2021
tblDemolition	PhaseName	Demolition	Mobilization
tblGrading	PhaseName	Grading	Deck Construction - Demo
tblGrading	PhaseName	Site Preparation	Pile Driving
tblOffRoadEquipment	HorsePower	158.00	1,050.00
tblOffRoadEquipment	HorsePower	158.00	300.00
tblOffRoadEquipment	LoadFactor	0.38	0.60
tblOffRoadEquipment	LoadFactor	0.38	0.60
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentType		Excavators
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00

tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	1.00	0.00
tblOffRoadEquipment	PhaseName	Architectural Coating	Punch List and Final Completion
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Demolition	Mobilization
tblOffRoadEquipment	PhaseName	Grading	Deck Construction - Demo
tblOffRoadEquipment	PhaseName	Building Construction	Deck Construction - New Deck
tblOffRoadEquipment	PhaseName	Building Construction	Deck Construction - New Deck
tblOffRoadEquipment	PhaseName	Site Preparation	Pile Driving
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Demolition	Mobilization
tblOffRoadEquipment	PhaseName	Grading	Deck Construction - Demo
tblOffRoadEquipment	PhaseName	Building Construction	Deck Construction - New Deck
tblOffRoadEquipment	PhaseName	Demolition	Mobilization
tblOffRoadEquipment	PhaseName	Grading	Deck Construction - Demo
tblOffRoadEquipment	PhaseName	Paving	Fenders, Wharf Appurtenances, Utilities
tblOffRoadEquipment	PhaseName	Site Preparation	Pile Driving
tblOffRoadEquipment	PhaseName		Pile Driving
tblOffRoadEquipment	PhaseName		Pile Driving
tblTripsAndVMT	PhaseName		Mobilization
tblTripsAndVMT	PhaseName		Pile Driving
tblTripsAndVMT	PhaseName		Deck Construction - Demo
tblTripsAndVMT	PhaseName		Deck Construction - New Deck
tblTripsAndVMT	PhaseName		Fenders, Wharf Appurtenances, Utilities

tblTripsAndVMT	PhaseName		Punch List and Final Completion
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	VendorTripNumber	0.00	1.00
tblTripsAndVMT	WorkerTripNumber	5.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00
tblTripsAndVMT	WorkerTripNumber	18.00	10.00
tblTripsAndVMT	WorkerTripNumber	0.00	10.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0174	0.1503	0.1534	4.1000e-004	5.8100e-003	6.5600e-003	0.0124	1.5500e-003	6.1000e-003	7.6500e-003	0.0000	35.3074	35.3074	8.8600e-003	0.0000	35.5289
2022	0.0192	0.1629	0.2016	3.4000e-004	3.6200e-003	8.1300e-003	0.0118	9.6000e-004	7.6000e-003	8.5700e-003	0.0000	28.9045	28.9045	7.2700e-003	0.0000	29.0864
Maximum	**0.0192**	**0.1629**	**0.2016**	**4.1000e-004**	**5.8100e-003**	**8.1300e-003**	**0.0124**	**1.5500e-003**	**7.6000e-003**	**8.5700e-003**	**0.0000**	**35.3074**	**35.3074**	**8.8600e-003**	**0.0000**	**35.5289**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	0.0174	0.1011	0.1534	4.1000e-004	5.8100e-003	6.5600e-003	0.0124	1.5500e-003	6.1000e-003	7.6500e-003	0.0000	35.3073	35.3073	8.8600e-003	0.0000	35.5289

2022	0.0192	0.1629	0.2016	3.4000e-004	3.6200e-003	8.1300e-003	0.0118	9.6000e-004	7.6000e-003	8.5700e-003	0.0000	28.9045	28.9045	7.2700e-003	0.0000	29.0864
Maximum	**0.0192**	**0.1629**	**0.2016**	**4.1000e-004**	**5.8100e-003**	**8.1300e-003**	**0.0124**	**1.5500e-003**	**7.6000e-003**	**8.5700e-003**	**0.0000**	**35.3073**	**35.3073**	**8.8600e-003**	**0.0000**	**35.5289**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**15.69**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-3-2021**	**12-2-2021**	0.0879	0.0392
2	**12-3-2021**	**3-2-2022**	0.2238	0.2238
3	**3-3-2022**	**6-2-2022**	0.0398	0.0398
		Highest	0.2238	0.2238

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Demolition	9/1/2021	9/1/2021	5	1	
2	Pile Driving	Site Preparation	9/6/2021	11/30/2021	5	62	
3	Deck Construction - Demo	Grading	9/3/2021	9/7/2021	5	3	
4	Deck Construction - New Deck	Building Construction	11/3/2021	2/8/2022	5	70	
5	Fenders, Wharf Appurtenances, Utilities	Paving	11/30/2021	3/15/2022	5	76	
6	Punch List and Final Completion	Architectural Coating	3/30/2022	4/12/2022	5	10	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Punch List and Final Completion	Air Compressors	1	6.00	78	0.48
Fenders, Wharf Appurtenances, Utilities	Cement and Mortar Mixers	4	6.00	9	0.56
Mobilization	Concrete/Industrial Saws	0	8.00	81	0.73
Deck Construction - Demo	Concrete/Industrial Saws	1	8.00	81	0.73
Deck Construction - New Deck	Cranes	0	4.00	231	0.29
Deck Construction - New Deck	Forklifts	0	6.00	89	0.20
Pile Driving	Graders	0	8.00	187	0.41
Fenders, Wharf Appurtenances, Utilities	Pavers	1	7.00	130	0.42
Fenders, Wharf Appurtenances, Utilities	Rollers	1	7.00	80	0.38
Mobilization	Rubber Tired Dozers	0	1.00	247	0.40
Deck Construction - Demo	Rubber Tired Dozers	1	1.00	247	0.40
Deck Construction - New Deck	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Mobilization	Tractors/Loaders/Backhoes	0	6.00	97	0.37
Deck Construction - Demo	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Fenders, Wharf Appurtenances, Utilities	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Pile Driving	Tractors/Loaders/Backhoes	0	8.00	97	0.37
Pile Driving	Excavators	1	5.00	1050	0.60
Pile Driving	Excavators	1	3.00	300	0.60

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Mobilization	4	10.00	1.00	2.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Pile Driving	2	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Deck Construction - Demo	4	10.00	0.00	56.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Deck Construction - New Deck	5	10.00	0.00	3.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Fenders, Wharf Appurtenances	7	10.00	0.00	3.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Punch List and Final Completion	1	10.00	1.00	2.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.7000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0749	0.0749	0.0000	0.0000	0.0750
Vendor	0.0000	5.0000e-005	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0129	0.0129	0.0000	0.0000	0.0129
Worker	2.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0336	0.0336	0.0000	0.0000	0.0336
Total	**3.0000e-005**	**3.3000e-004**	**1.7000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.1214**	**0.1214**	**0.0000**	**0.0000**	**0.1215**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.7000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0749	0.0749	0.0000	0.0000	0.0750
Vendor	0.0000	5.0000e-005	1.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0129	0.0129	0.0000	0.0000	0.0129
Worker	2.0000e-005	1.0000e-005	1.1000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0336	0.0336	0.0000	0.0000	0.0336
Total	**3.0000e-005**	**3.3000e-004**	**1.7000e-004**	**0.0000**	**6.0000e-005**	**0.0000**	**6.0000e-005**	**1.0000e-005**	**0.0000**	**2.0000e-005**	**0.0000**	**0.1214**	**0.1214**	**0.0000**	**0.0000**	**0.1215**

3.3 Pile Driving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	5.2800e-003	0.0492	0.0401	1.8000e-004		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	15.7227	15.7227	5.0900e-003	0.0000	15.8499
Total	**5.2800e-003**	**0.0492**	**0.0401**	**1.8000e-004**	**0.0000**	**1.6400e-003**	**1.6400e-003**	**0.0000**	**1.5100e-003**	**1.5100e-003**	**0.0000**	**15.7227**	**15.7227**	**5.0900e-003**	**0.0000**	**15.8499**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.7000e-004	7.1000e-003	2.0000e-005	2.4600e-003	2.0000e-005	2.4700e-003	6.5000e-004	1.0000e-005	6.7000e-004	0.0000	2.0805	2.0805	5.0000e-005	0.0000	2.0817
Total	**9.6000e-004**	**6.7000e-004**	**7.1000e-003**	**2.0000e-005**	**2.4600e-003**	**2.0000e-005**	**2.4700e-003**	**6.5000e-004**	**1.0000e-005**	**6.7000e-004**	**0.0000**	**2.0805**	**2.0805**	**5.0000e-005**	**0.0000**	**2.0817**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	5.2800e-003	0.0000	0.0401	1.8000e-004		1.6400e-003	1.6400e-003		1.5100e-003	1.5100e-003	0.0000	15.7227	15.7227	5.0900e-003	0.0000	15.8498
Total	**5.2800e-003**	**0.0000**	**0.0401**	**1.8000e-004**	**0.0000**	**1.6400e-003**	**1.6400e-003**	**0.0000**	**1.5100e-003**	**1.5100e-003**	**0.0000**	**15.7227**	**15.7227**	**5.0900e-003**	**0.0000**	**15.8498**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	9.6000e-004	6.7000e-004	7.1000e-003	2.0000e-005	2.4600e-003	2.0000e-005	2.4700e-003	6.5000e-004	1.0000e-005	6.7000e-004	0.0000	2.0805	2.0805	5.0000e-005	0.0000	2.0817
Total	**9.6000e-004**	**6.7000e-004**	**7.1000e-003**	**2.0000e-005**	**2.4600e-003**	**2.0000e-005**	**2.4700e-003**	**6.5000e-004**	**1.0000e-005**	**6.7000e-004**	**0.0000**	**2.0805**	**2.0805**	**5.0000e-005**	**0.0000**	**2.0817**

3.4 Deck Construction - Demo - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1900e-003	0.0109	0.0114	2.0000e-005		6.1000e-004	6.1000e-004		5.8000e-004	5.8000e-004	0.0000	1.5614	1.5614	2.9000e-004	0.0000	1.5687
Total	**1.1900e-003**	**0.0109**	**0.0114**	**2.0000e-005**	**0.0000**	**6.1000e-004**	**6.1000e-004**	**0.0000**	**5.8000e-004**	**5.8000e-004**	**0.0000**	**1.5614**	**1.5614**	**2.9000e-004**	**0.0000**	**1.5687**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.2000e-004	7.5000e-003	1.4900e-003	2.0000e-005	4.7000e-004	2.0000e-005	5.0000e-004	1.3000e-004	2.0000e-005	1.5000e-004	0.0000	2.0970	2.0970	9.0000e-005	0.0000	2.0993
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1007	0.1007	0.0000	0.0000	0.1007
Total	**2.7000e-004**	**7.5300e-003**	**1.8300e-003**	**2.0000e-005**	**5.9000e-004**	**2.0000e-005**	**6.2000e-004**	**1.6000e-004**	**2.0000e-005**	**1.8000e-004**	**0.0000**	**2.1977**	**2.1977**	**9.0000e-005**	**0.0000**	**2.2000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.1900e-003	0.0109	0.0114	2.0000e-005		6.1000e-004	6.1000e-004		5.8000e-004	5.8000e-004	0.0000	1.5614	1.5614	2.9000e-004	0.0000	1.5687
Total	**1.1900e-003**	**0.0109**	**0.0114**	**2.0000e-005**	**0.0000**	**6.1000e-004**	**6.1000e-004**	**0.0000**	**5.8000e-004**	**5.8000e-004**	**0.0000**	**1.5614**	**1.5614**	**2.9000e-004**	**0.0000**	**1.5687**

Mitigated Construction Off-Site

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

Hauling	2.2000e-004	7.5000e-003	1.4900e-003	2.0000e-005	4.7000e-004	2.0000e-005	5.0000e-004	1.3000e-004	2.0000e-005	1.5000e-004	0.0000	2.0970	2.0970	9.0000e-005	0.0000	2.0993
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.4000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1007	0.1007	0.0000	0.0000	0.1007
Total	**2.7000e-004**	**7.5300e-003**	**1.8300e-003**	**2.0000e-005**	**5.9000e-004**	**2.0000e-005**	**6.2000e-004**	**1.6000e-004**	**2.0000e-005**	**1.8000e-004**	**0.0000**	**2.1977**	**2.1977**	**9.0000e-005**	**0.0000**	**2.2000**

3.5 Deck Construction - New Deck - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0690	0.0690	0.0000	0.0000	0.0691
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.7000e-004	4.9200e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.4429	1.4429	3.0000e-005	0.0000	1.4437
Total	**6.8000e-004**	**7.2000e-004**	**4.9700e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.5119**	**1.5119**	**3.0000e-005**	**0.0000**	**1.5128**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0690	0.0690	0.0000	0.0000	0.0691
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.7000e-004	4.7000e-004	4.9200e-003	2.0000e-005	1.7100e-003	1.0000e-005	1.7200e-003	4.5000e-004	1.0000e-005	4.6000e-004	0.0000	1.4429	1.4429	3.0000e-005	0.0000	1.4437
Total	**6.8000e-004**	**7.2000e-004**	**4.9700e-003**	**2.0000e-005**	**1.7300e-003**	**1.0000e-005**	**1.7400e-003**	**4.6000e-004**	**1.0000e-005**	**4.7000e-004**	**0.0000**	**1.5119**	**1.5119**	**3.0000e-005**	**0.0000**	**1.5128**

3.5 Deck Construction - New Deck - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.4000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0428	0.0428	0.0000	0.0000	0.0428
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	2.6000e-004	2.8400e-003	1.0000e-005	1.0700e-003	1.0000e-005	1.0800e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8724	0.8724	2.0000e-005	0.0000	0.8728
Total	**3.9000e-004**	**4.0000e-004**	**2.8700e-003**	**1.0000e-005**	**1.0900e-003**	**1.0000e-005**	**1.1000e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9151**	**0.9151**	**2.0000e-005**	**0.0000**	**0.9156**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.4000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0428	0.0428	0.0000	0.0000	0.0428
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.9000e-004	2.6000e-004	2.8400e-003	1.0000e-005	1.0700e-003	1.0000e-005	1.0800e-003	2.8000e-004	1.0000e-005	2.9000e-004	0.0000	0.8724	0.8724	2.0000e-005	0.0000	0.8728
Total	**3.9000e-004**	**4.0000e-004**	**2.8700e-003**	**1.0000e-005**	**1.0900e-003**	**1.0000e-005**	**1.1000e-003**	**2.9000e-004**	**1.0000e-005**	**3.0000e-004**	**0.0000**	**0.9151**	**0.9151**	**2.0000e-005**	**0.0000**	**0.9156**

3.6 Fenders, Wharf Appurtenances, Utilities - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6600e-003	0.0806	0.0851	1.4000e-004		4.2400e-003	4.2400e-003		3.9400e-003	3.9400e-003	0.0000	11.2710	11.2710	3.2800e-003	0.0000	11.3530
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.6600e-003**	**0.0806**	**0.0851**	**1.4000e-004**		**4.2400e-003**	**4.2400e-003**		**3.9400e-003**	**3.9400e-003**	**0.0000**	**11.2710**	**11.2710**	**3.2800e-003**	**0.0000**	**11.3530**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	1.3000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0355	0.0355	0.0000	0.0000	0.0355
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**3.7000e-004**	**3.9000e-004**	**2.7800e-003**	**1.0000e-005**	**9.7000e-004**	**1.0000e-005**	**9.8000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8408**	**0.8408**	**2.0000e-005**	**0.0000**	**0.8413**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.6600e-003	0.0806	0.0851	1.4000e-004		4.2400e-003	4.2400e-003		3.9400e-003	3.9400e-003	0.0000	11.2710	11.2710	3.2800e-003	0.0000	11.3530
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**8.6600e-003**	**0.0806**	**0.0851**	**1.4000e-004**		**4.2400e-003**	**4.2400e-003**		**3.9400e-003**	**3.9400e-003**	**0.0000**	**11.2710**	**11.2710**	**3.2800e-003**	**0.0000**	**11.3530**

Mitigated Construction Off-Site

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

Hauling	0.0000	1.3000e-004	3.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0355	0.0355	0.0000	0.0000	0.0355
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**3.7000e-004**	**3.9000e-004**	**2.7800e-003**	**1.0000e-005**	**9.7000e-004**	**1.0000e-005**	**9.8000e-004**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8408**	**0.8408**	**2.0000e-005**	**0.0000**	**0.8413**

3.6 Fenders, Wharf Appurtenances, Utilities - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0168	0.1539	0.1829	2.9000e-004		7.7000e-003	7.7000e-003		7.1700e-003	7.1700e-003	0.0000	24.4318	24.4318	7.1200e-003	0.0000	24.6097
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0168**	**0.1539**	**0.1829**	**2.9000e-004**		**7.7000e-003**	**7.7000e-003**		**7.1700e-003**	**7.1700e-003**	**0.0000**	**24.4318**	**24.4318**	**7.1200e-003**	**0.0000**	**24.6097**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0758	0.0758	0.0000	0.0000	0.0759
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5000e-004	5.0000e-004	5.4700e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.6801	1.6801	4.0000e-005	0.0000	1.6810
Total	**7.6000e-004**	**7.5000e-004**	**5.5200e-003**	**2.0000e-005**	**2.0800e-003**	**1.0000e-005**	**2.1000e-003**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**0.0000**	**1.7560**	**1.7560**	**4.0000e-005**	**0.0000**	**1.7569**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0168	0.1539	0.1829	2.9000e-004		7.7000e-003	7.7000e-003		7.1700e-003	7.1700e-003	0.0000	24.4318	24.4318	7.1200e-003	0.0000	24.6097
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0168**	**0.1539**	**0.1829**	**2.9000e-004**		**7.7000e-003**	**7.7000e-003**		**7.1700e-003**	**7.1700e-003**	**0.0000**	**24.4318**	**24.4318**	**7.1200e-003**	**0.0000**	**24.6097**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0758	0.0758	0.0000	0.0000	0.0759
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	7.5000e-004	5.0000e-004	5.4700e-003	2.0000e-005	2.0600e-003	1.0000e-005	2.0800e-003	5.5000e-004	1.0000e-005	5.6000e-004	0.0000	1.6801	1.6801	4.0000e-005	0.0000	1.6810
Total	**7.6000e-004**	**7.5000e-004**	**5.5200e-003**	**2.0000e-005**	**2.0800e-003**	**1.0000e-005**	**2.1000e-003**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**0.0000**	**1.7560**	**1.7560**	**4.0000e-005**	**0.0000**	**1.7569**

3.7 Punch List and Final Completion - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**1.0200e-003**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0739	0.0739	0.0000	0.0000	0.0740
Vendor	2.0000e-005	4.9000e-004	1.2000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1280	0.1280	1.0000e-005	0.0000	0.1282
Worker	1.4000e-004	1.0000e-004	1.0500e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3231	0.3231	1.0000e-005	0.0000	0.3233
Total	**1.7000e-004**	**8.4000e-004**	**1.2200e-003**	**0.0000**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.5250**	**0.5250**	**2.0000e-005**	**0.0000**	**0.5254**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Off-Road	1.0200e-003	7.0400e-003	9.0700e-003	1.0000e-005		4.1000e-004	4.1000e-004		4.1000e-004	4.1000e-004	0.0000	1.2766	1.2766	8.0000e-005	0.0000	1.2787
Total	**1.0200e-003**	**7.0400e-003**	**9.0700e-003**	**1.0000e-005**		**4.1000e-004**	**4.1000e-004**		**4.1000e-004**	**4.1000e-004**	**0.0000**	**1.2766**	**1.2766**	**8.0000e-005**	**0.0000**	**1.2787**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.0000e-005	2.5000e-004	5.0000e-005	0.0000	2.0000e-005	0.0000	2.0000e-005	0.0000	0.0000	1.0000e-005	0.0000	0.0739	0.0739	0.0000	0.0000	0.0740
Vendor	2.0000e-005	4.9000e-004	1.2000e-004	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1280	0.1280	1.0000e-005	0.0000	0.1282
Worker	1.4000e-004	1.0000e-004	1.0500e-003	0.0000	4.0000e-004	0.0000	4.0000e-004	1.1000e-004	0.0000	1.1000e-004	0.0000	0.3231	0.3231	1.0000e-005	0.0000	0.3233
Total	**1.7000e-004**	**8.4000e-004**	**1.2200e-003**	**0.0000**	**4.5000e-004**	**0.0000**	**4.5000e-004**	**1.2000e-004**	**0.0000**	**1.3000e-004**	**0.0000**	**0.5250**	**0.5250**	**2.0000e-005**	**0.0000**	**0.5254**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Industrial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-...	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Industrial	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Industrial	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Unmitigated	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Landscaping	0.0000	0.0000	1.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	2.0000e-005	2.0000e-005	0.0000	0.0000	2.0000e-005
Total	**0.0000**	**0.0000**	**1.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**2.0000e-005**	**2.0000e-005**	**0.0000**	**0.0000**	**2.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

AMPORTS Landside Construction

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	25.33	1000sqft	0.58	25,328.00	0
Parking Lot	20.00	Acre	20.49	871,200.00	0
Other Asphalt Surfaces	0.35	Acre	0.35	15,376.68	0
Other Non-Asphalt Surfaces	7.60	Acre	17.48	331,056.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - PD

Construction Phase - Project Specific Construction Schedule provided by applicant

Off-road Equipment - No offroad equip

Off-road Equipment - No offroad equip

Off-road Equipment - Applicant provided data

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - Applicant provided information

Off-road Equipment - applicant provided information

Off-road Equipment - applicant provided information

Off-road Equipment - No offroad equipment

Trips and VMT - Based on applicant provided information

Off-road Equipment - Applicant provided information

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2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	2.9200e-003	0.0239	0.0208	6.0000e-005	2.7900e-003	8.2000e-004	3.6200e-003	7.5000e-004	7.7000e-004	1.5200e-003	0.0000	5.5405	5.5405	6.0000e-004	0.0000	5.5556
2022	0.1503	1.1980	1.2053	2.7600e-003	0.0545	0.0497	0.1042	0.0146	0.0460	0.0606	0.0000	245.0673	245.0673	0.0575	0.0000	246.5053
Maximum	**0.1503**	**1.1980**	**1.2053**	**2.7600e-003**	**0.0545**	**0.0497**	**0.1042**	**0.0146**	**0.0460**	**0.0606**	**0.0000**	**245.0673**	**245.0673**	**0.0575**	**0.0000**	**246.5053**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2021	2.9200e-003	0.0239	0.0208	6.0000e-005	2.7900e-003	8.2000e-004	3.6200e-003	7.5000e-004	7.7000e-004	1.5200e-003	0.0000	5.5405	5.5405	6.0000e-004	0.0000	5.5556
2022	0.1503	0.8167	1.2053	2.7600e-003	0.0545	0.0497	0.1042	0.0146	0.0460	0.0606	0.0000	245.0670	245.0670	0.0575	0.0000	246.5051
Maximum	**0.1503**	**0.8167**	**1.2053**	**2.7600e-003**	**0.0545**	**0.0497**	**0.1042**	**0.0146**	**0.0460**	**0.0606**	**0.0000**	**245.0670**	**245.0670**	**0.0575**	**0.0000**	**246.5051**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**31.20**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	12-16-2021	3-15-2022	0.2216	0.2169
2	3-16-2022	6-15-2022	0.9444	0.6029
3	6-16-2022	9-15-2022	0.2081	0.1730
		Highest	0.9444	0.6029

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Mobilization	Demolition	12/16/2021	12/22/2021	5	5	
2	Erosion Control	Demolition	12/23/2021	12/29/2021	5	5	
3	Demolition	Demolition	12/30/2021	1/5/2022	5	5	
4	Utilities	Trenching	1/6/2022	3/30/2022	5	60	
5	Construct Building Foundations	Building Construction	3/31/2022	6/1/2022	5	45	
6	Site Paving	Paving	3/31/2022	6/22/2022	5	60	
7	Erect Light Poles	Building Construction	3/31/2022	4/27/2022	5	20	
8	Erect Pre-Engineered Metal Building	Building Construction	6/10/2022	7/7/2022	5	20	
9	Building Interior Construction	Building Construction	7/8/2022	8/4/2022	5	20	
10	Building Finishes	Building Construction	8/5/2022	9/1/2022	5	20	
11	Punch List and Final Completion	Building Construction	9/2/2022	9/8/2022	5	5	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 38.32

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Erect Pre-Engineered Metal Building	Cranes	1	6.00	226	0.29
Erect Pre-Engineered Metal Building	Forklifts	2	6.00	89	0.20
Erect Pre-Engineered Metal Building	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Site Paving	Pavers	2	6.00	130	0.42
Site Paving	Rollers	2	6.00	80	0.38
Utilities	Tractors/Loaders/Backhoes	2	6.00	97	0.37

Construct Building Foundations	Cranes	0	0.00	231	0.29
Construct Building Foundations	Forklifts	0	0.00	89	0.20
Construct Building Foundations	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Erosion Control	Concrete/Industrial Saws	0	0.00	81	0.73
Erosion Control	Rubber Tired Dozers	0	0.00	247	0.40
Utilities	Excavators	1	6.00	162	0.38
Mobilization	Concrete/Industrial Saws	0	0.00	81	0.73
Mobilization	Rubber Tired Dozers	0	0.00	247	0.40
Utilities	Rollers	1	6.00	80	0.38
Demolition	Concrete/Industrial Saws	2	6.00	40	0.73
Demolition	Rubber Tired Dozers	1	6.00	247	0.40
Utilities	Plate Compactors	1	6.00	8	0.43
Demolition	Excavators	1	6.00	162	0.38
Construct Building Foundations	Excavators	1	6.00	162	0.38
Construct Building Foundations	Rollers	1	6.00	80	0.38
Site Paving	Surfacing Equipment	2	6.00	225	0.78
Site Paving	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Building Interior Construction		1	6.00	62	0.31
Building Finishes	Aerial Lifts	1	6.00	62	0.31
Erect Pre-Engineered Metal Building	Generator Sets	1	6.00	84	0.74
Erect Pre-Engineered Metal Building	Welders	3	6.00	46	0.45
Erect Light Poles	Cranes	1	6.00	226	0.29
Building Interior Construction	Forklifts	1	6.00	89	0.20
Building Finishes	Forklifts	1	6.00	89	0.20
Building Finishes	Cranes	0	0.00	231	0.29
Punch List and Final Completion	Cranes	0	0.00	231	0.29
Building Interior Construction	Cranes	0	0.00	231	0.29
Mobilization	Excavators	0	0.00	158	0.38
Erosion Control	Excavators	0	0.00	158	0.38
Punch List and Final Completion	Forklifts	0	0.00	89	0.20

Erect Light Poles	Forklifts	0	0.00	89	0.20
Building Finishes	Generator Sets	0	0.00	84	0.74
Punch List and Final Completion	Generator Sets	0	0.00	84	0.74
Construct Building Foundations	Generator Sets	0	0.00	84	0.74
Erect Light Poles	Generator Sets	0	0.00	84	0.74
Building Interior Construction	Generator Sets	0	0.00	84	0.74
Site Paving	Paving Equipment	0	0.00	132	0.36
Building Finishes	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Punch List and Final Completion	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Erect Light Poles	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Interior Construction	Tractors/Loaders/Backhoes	0	0.00	97	0.37
Building Finishes	Welders	0	0.00	46	0.45
Punch List and Final Completion	Welders	0	0.00	46	0.45
Construct Building Foundations	Welders	0	0.00	46	0.45
Erect Light Poles	Welders	0	0.00	46	0.45
Building Interior Construction	Welders	0	0.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Construct Building Foundations	9	48.00	0.00	108.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Erect Pre-Engineered Metal Building	9	48.00	0.00	15.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Mobilization	6	48.00	10.00	5.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Erosion Control	6	48.00	10.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Demolition	6	48.00	10.00	10.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Site Paving	6	48.00	0.00	399.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Utilities	0	48.00	6.00	30.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Building Finishes	9	48.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Punch List and Final Completion	9	48.00	10.00	5.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Erect Light Poles	9	48.00	0.00	15.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

Building Interior Construction	9	48.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Mobilization - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	6.7000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1872	0.1872	1.0000e-005	0.0000	0.1874
Vendor	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.7000e-004**	**3.5100e-003**	**3.5400e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.6388**	**1.6388**	**6.0000e-005**	**0.0000**	**1.6403**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	6.7000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1872	0.1872	1.0000e-005	0.0000	0.1874
Vendor	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.7000e-004**	**3.5100e-003**	**3.5400e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**2.0000e-005**	**3.2000e-004**	**0.0000**	**1.6388**	**1.6388**	**6.0000e-005**	**0.0000**	**1.6403**

3.3 Erosion Control - 2021

Unmitigated Construction On-Site

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

Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.5000e-004**	**2.8400e-003**	**3.4100e-003**	**2.0000e-005**	**1.1100e-003**	**2.0000e-005**	**1.1300e-003**	**3.0000e-004**	**2.0000e-005**	**3.1000e-004**	**0.0000**	**1.4516**	**1.4516**	**5.0000e-005**	**0.0000**	**1.4528**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	8.0000e-005	2.5800e-003	6.6000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	1.0000e-005	5.0000e-005	0.0000	0.6463	0.6463	3.0000e-005	0.0000	0.6470
Worker	3.7000e-004	2.6000e-004	2.7500e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.8054	0.8054	2.0000e-005	0.0000	0.8058
Total	**4.5000e-004**	**2.8400e-003**	**3.4100e-003**	**2.0000e-005**	**1.1100e-003**	**2.0000e-005**	**1.1300e-003**	**3.0000e-004**	**2.0000e-005**	**3.1000e-004**	**0.0000**	**1.4516**	**1.4516**	**5.0000e-005**	**0.0000**	**1.4528**

3.4 Demolition - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0159	0.0124	2.0000e-005		7.9000e-004	7.9000e-004		7.4000e-004	7.4000e-004	0.0000	1.7196	1.7196	4.7000e-004	0.0000	1.7314
Total	**1.8000e-003**	**0.0159**	**0.0124**	**2.0000e-005**		**7.9000e-004**	**7.9000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**1.7196**	**1.7196**	**4.7000e-004**	**0.0000**	**1.7314**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	5.4000e-004	1.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1498	0.1498	1.0000e-005	0.0000	0.1500
Vendor	3.0000e-005	1.0300e-003	2.6000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2585	0.2585	1.0000e-005	0.0000	0.2588
Worker	1.5000e-004	1.0000e-004	1.1000e-003	0.0000	3.8000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3221	0.3221	1.0000e-005	0.0000	0.3223
Total	**2.0000e-004**	**1.6700e-003**	**1.4700e-003**	**0.0000**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.7304**	**0.7304**	**3.0000e-005**	**0.0000**	**0.7311**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.8000e-003	0.0159	0.0124	2.0000e-005		7.9000e-004	7.9000e-004		7.4000e-004	7.4000e-004	0.0000	1.7196	1.7196	4.7000e-004	0.0000	1.7314
Total	**1.8000e-003**	**0.0159**	**0.0124**	**2.0000e-005**		**7.9000e-004**	**7.9000e-004**		**7.4000e-004**	**7.4000e-004**	**0.0000**	**1.7196**	**1.7196**	**4.7000e-004**	**0.0000**	**1.7314**

Mitigated Construction Off-Site

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

Hauling	2.0000e-005	5.4000e-004	1.1000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.1498	0.1498	1.0000e-005	0.0000	0.1500
Vendor	3.0000e-005	1.0300e-003	2.6000e-004	0.0000	7.0000e-005	0.0000	7.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2585	0.2585	1.0000e-005	0.0000	0.2588
Worker	1.5000e-004	1.0000e-004	1.1000e-003	0.0000	3.8000e-004	0.0000	3.8000e-004	1.0000e-004	0.0000	1.0000e-004	0.0000	0.3221	0.3221	1.0000e-005	0.0000	0.3223
Total	**2.0000e-004**	**1.6700e-003**	**1.4700e-003**	**0.0000**	**5.2000e-004**	**0.0000**	**5.2000e-004**	**1.4000e-004**	**0.0000**	**1.4000e-004**	**0.0000**	**0.7304**	**0.7304**	**3.0000e-005**	**0.0000**	**0.7311**

3.4 Demolition - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3100e-003	0.0203	0.0179	3.0000e-005		9.5000e-004	9.5000e-004		8.9000e-004	8.9000e-004	0.0000	2.5796	2.5796	7.0000e-004	0.0000	2.5971
Total	**2.3100e-003**	**0.0203**	**0.0179**	**3.0000e-005**		**9.5000e-004**	**9.5000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**2.5796**	**2.5796**	**7.0000e-004**	**0.0000**	**2.5971**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.4000e-004	1.6000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2217	0.2217	1.0000e-005	0.0000	0.2219
Vendor	5.0000e-005	1.4600e-003	3.7000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.3841	0.3841	2.0000e-005	0.0000	0.3845
Worker	2.1000e-004	1.4000e-004	1.5100e-003	1.0000e-005	5.7000e-004	0.0000	5.7000e-004	1.5000e-004	0.0000	1.6000e-004	0.0000	0.4653	0.4653	1.0000e-005	0.0000	0.4655
Total	**2.8000e-004**	**2.3400e-003**	**2.0400e-003**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**1.0710**	**1.0710**	**4.0000e-005**	**0.0000**	**1.0719**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.3100e-003	0.0203	0.0179	3.0000e-005		9.5000e-004	9.5000e-004		8.9000e-004	8.9000e-004	0.0000	2.5796	2.5796	7.0000e-004	0.0000	2.5971
Total	**2.3100e-003**	**0.0203**	**0.0179**	**3.0000e-005**		**9.5000e-004**	**9.5000e-004**		**8.9000e-004**	**8.9000e-004**	**0.0000**	**2.5796**	**2.5796**	**7.0000e-004**	**0.0000**	**2.5971**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	7.4000e-004	1.6000e-004	0.0000	8.0000e-005	0.0000	8.0000e-005	2.0000e-005	0.0000	2.0000e-005	0.0000	0.2217	0.2217	1.0000e-005	0.0000	0.2219
Vendor	5.0000e-005	1.4600e-003	3.7000e-004	0.0000	1.0000e-004	0.0000	1.0000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.3841	0.3841	2.0000e-005	0.0000	0.3845
Worker	2.1000e-004	1.4000e-004	1.5100e-003	1.0000e-005	5.7000e-004	0.0000	5.7000e-004	1.5000e-004	0.0000	1.6000e-004	0.0000	0.4653	0.4653	1.0000e-005	0.0000	0.4655
Total	**2.8000e-004**	**2.3400e-003**	**2.0400e-003**	**1.0000e-005**	**7.5000e-004**	**0.0000**	**7.5000e-004**	**2.0000e-004**	**0.0000**	**2.1000e-004**	**0.0000**	**1.0710**	**1.0710**	**4.0000e-005**	**0.0000**	**1.0719**

3.5 Utilities - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0167	0.1609	0.2224	3.3000e-004		8.5000e-003	8.5000e-003		7.8300e-003	7.8300e-003	0.0000	28.6526	28.6526	9.1100e-003	0.0000	28.8804
Total	**0.0167**	**0.1609**	**0.2224**	**3.3000e-004**		**8.5000e-003**	**8.5000e-003**		**7.8300e-003**	**7.8300e-003**	**0.0000**	**28.6526**	**28.6526**	**9.1100e-003**	**0.0000**	**28.8804**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	3.6800e-003	7.8000e-004	1.0000e-005	2.5000e-004	1.0000e-005	2.6000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.1084	1.1084	5.0000e-005	0.0000	1.1096
Vendor	5.5000e-004	0.0176	4.4300e-003	5.0000e-005	1.1800e-003	4.0000e-005	1.2200e-003	3.4000e-004	3.0000e-005	3.8000e-004	0.0000	4.6090	4.6090	2.0000e-004	0.0000	4.6141
Worker	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**4.8100e-003**	**0.0240**	**0.0355**	**1.6000e-004**	**0.0129**	**1.2000e-004**	**0.0130**	**3.4500e-003**	**1.1000e-004**	**3.5600e-003**	**0.0000**	**15.0227**	**15.0227**	**4.5000e-004**	**0.0000**	**15.0340**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0167	0.1552	0.2224	3.3000e-004		8.5000e-003	8.5000e-003		7.8300e-003	7.8300e-003	0.0000	28.6525	28.6525	9.1100e-003	0.0000	28.8803

Total	**0.0167**	**0.1552**	**0.2224**	**3.3000e-004**		**8.5000e-003**	**8.5000e-003**		**7.8300e-003**	**7.8300e-003**	**0.0000**	**28.6525**	**28.6525**	**9.1100e-003**	**0.0000**	**28.8803**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.1000e-004	3.6800e-003	7.8000e-004	1.0000e-005	2.5000e-004	1.0000e-005	2.6000e-004	7.0000e-005	1.0000e-005	8.0000e-005	0.0000	1.1084	1.1084	5.0000e-005	0.0000	1.1096
Vendor	5.5000e-004	0.0176	4.4300e-003	5.0000e-005	1.1800e-003	4.0000e-005	1.2200e-003	3.4000e-004	3.0000e-005	3.8000e-004	0.0000	4.6090	4.6090	2.0000e-004	0.0000	4.6141
Worker	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**4.8100e-003**	**0.0240**	**0.0355**	**1.6000e-004**	**0.0129**	**1.2000e-004**	**0.0130**	**3.4500e-003**	**1.1000e-004**	**3.5600e-003**	**0.0000**	**15.0227**	**15.0227**	**4.5000e-004**	**0.0000**	**15.0340**

3.6 Construct Building Foundations - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0119	0.1164	0.1633	2.4000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	20.9616	20.9616	6.7800e-003	0.0000	21.1311
Total	**0.0119**	**0.1164**	**0.1633**	**2.4000e-004**		**6.2100e-003**	**6.2100e-003**		**5.7100e-003**	**5.7100e-003**	**0.0000**	**20.9616**	**20.9616**	**6.7800e-003**	**0.0000**	**21.1311**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	4.0000e-004	0.0133	2.8100e-003	4.0000e-005	9.1000e-004	4.0000e-005	9.5000e-004	2.5000e-004	4.0000e-005	2.9000e-004	0.0000	3.9902	3.9902	1.7000e-004	0.0000	3.9945
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1100e-003	2.1000e-003	0.0227	8.0000e-005	8.5700e-003	5.0000e-005	8.6200e-003	2.2800e-003	5.0000e-005	2.3300e-003	0.0000	6.9790	6.9790	1.5000e-004	0.0000	6.9827
Total	**3.5100e-003**	**0.0154**	**0.0255**	**1.2000e-004**	**9.4800e-003**	**9.0000e-005**	**9.5700e-003**	**2.5300e-003**	**9.0000e-005**	**2.6200e-003**	**0.0000**	**10.9692**	**10.9692**	**3.2000e-004**	**0.0000**	**10.9772**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0119	0.1164	0.1632	2.4000e-004		6.2100e-003	6.2100e-003		5.7100e-003	5.7100e-003	0.0000	20.9616	20.9616	6.7800e-003	0.0000	21.1310
Total	**0.0119**	**0.1164**	**0.1632**	**2.4000e-004**		**6.2100e-003**	**6.2100e-003**		**5.7100e-003**	**5.7100e-003**	**0.0000**	**20.9616**	**20.9616**	**6.7800e-003**	**0.0000**	**21.1310**

Mitigated Construction Off-Site

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

Hauling	4.0000e-004	0.0133	2.8100e-003	4.0000e-005	9.1000e-004	4.0000e-005	9.5000e-004	2.5000e-004	4.0000e-005	2.9000e-004	0.0000	3.9902	3.9902	1.7000e-004	0.0000	3.9945
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.1100e-003	2.1000e-003	0.0227	8.0000e-005	8.5700e-003	5.0000e-005	8.6200e-003	2.2800e-003	5.0000e-005	2.3300e-003	0.0000	6.9790	6.9790	1.5000e-004	0.0000	6.9827
Total	**3.5100e-003**	**0.0154**	**0.0255**	**1.2000e-004**	**9.4800e-003**	**9.0000e-005**	**9.5700e-003**	**2.5300e-003**	**9.0000e-005**	**2.6200e-003**	**0.0000**	**10.9692**	**10.9692**	**3.2000e-004**	**0.0000**	**10.9772**

3.7 Site Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0515	0.6190	0.4838	1.1600e-003		0.0249	0.0249		0.0229	0.0229	0.0000	101.5236	101.5236	0.0328	0.0000	102.3445
Paving	0.0273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0788**	**0.6190**	**0.4838**	**1.1600e-003**		**0.0249**	**0.0249**		**0.0229**	**0.0229**	**0.0000**	**101.5236**	**101.5236**	**0.0328**	**0.0000**	**102.3445**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4600e-003	0.0490	0.0104	1.5000e-004	3.3800e-003	1.4000e-004	3.5200e-003	9.3000e-004	1.4000e-004	1.0700e-003	0.0000	14.7414	14.7414	6.4000e-004	0.0000	14.7573
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**5.6100e-003**	**0.0518**	**0.0407**	**2.5000e-004**	**0.0148**	**2.1000e-004**	**0.0150**	**3.9700e-003**	**2.1000e-004**	**4.1700e-003**	**0.0000**	**24.0468**	**24.0468**	**8.4000e-004**	**0.0000**	**24.0676**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0515	0.2475	0.4838	1.1600e-003		0.0249	0.0249		0.0229	0.0229	0.0000	101.5235	101.5235	0.0328	0.0000	102.3444
Paving	0.0273					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0788**	**0.2475**	**0.4838**	**1.1600e-003**		**0.0249**	**0.0249**		**0.0229**	**0.0229**	**0.0000**	**101.5235**	**101.5235**	**0.0328**	**0.0000**	**102.3444**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.4600e-003	0.0490	0.0104	1.5000e-004	3.3800e-003	1.4000e-004	3.5200e-003	9.3000e-004	1.4000e-004	1.0700e-003	0.0000	14.7414	14.7414	6.4000e-004	0.0000	14.7573
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1500e-003	2.7900e-003	0.0303	1.0000e-004	0.0114	7.0000e-005	0.0115	3.0400e-003	7.0000e-005	3.1000e-003	0.0000	9.3054	9.3054	2.0000e-004	0.0000	9.3103
Total	**5.6100e-003**	**0.0518**	**0.0407**	**2.5000e-004**	**0.0148**	**2.1000e-004**	**0.0150**	**3.9700e-003**	**2.1000e-004**	**4.1700e-003**	**0.0000**	**24.0468**	**24.0468**	**8.4000e-004**	**0.0000**	**24.0676**

3.8 Erect Light Poles - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7400e-003	0.0307	0.0139	4.0000e-005		1.2700e-003	1.2700e-003		1.1700e-003	1.1700e-003	0.0000	3.7199	3.7199	1.2000e-003	0.0000	3.7500
Total	**2.7400e-003**	**0.0307**	**0.0139**	**4.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.1700e-003**	**1.1700e-003**	**0.0000**	**3.7199**	**3.7199**	**1.2000e-003**	**0.0000**	**3.7500**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.7400e-003	0.0307	0.0139	4.0000e-005		1.2700e-003	1.2700e-003		1.1700e-003	1.1700e-003	0.0000	3.7199	3.7199	1.2000e-003	0.0000	3.7500

Total	**2.7400e-003**	**0.0307**	**0.0139**	**4.0000e-005**		**1.2700e-003**	**1.2700e-003**		**1.1700e-003**	**1.1700e-003**	**0.0000**	**3.7199**	**3.7199**	**1.2000e-003**	**0.0000**	**3.7500**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

3.9 Erect Pre-Engineered Metal Building - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0156	0.1265	0.1305	2.2000e-004		6.2100e-003	6.2100e-003		5.9200e-003	5.9200e-003	0.0000	18.3075	18.3075	3.8900e-003	0.0000	18.4047
Total	**0.0156**	**0.1265**	**0.1305**	**2.2000e-004**		**6.2100e-003**	**6.2100e-003**		**5.9200e-003**	**5.9200e-003**	**0.0000**	**18.3075**	**18.3075**	**3.8900e-003**	**0.0000**	**18.4047**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0156	0.1265	0.1305	2.2000e-004		6.2100e-003	6.2100e-003		5.9200e-003	5.9200e-003	0.0000	18.3075	18.3075	3.8900e-003	0.0000	18.4047
Total	**0.0156**	**0.1265**	**0.1305**	**2.2000e-004**		**6.2100e-003**	**6.2100e-003**		**5.9200e-003**	**5.9200e-003**	**0.0000**	**18.3075**	**18.3075**	**3.8900e-003**	**0.0000**	**18.4047**

Mitigated Construction Off-Site

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

Hauling	5.0000e-005	1.8400e-003	3.9000e-004	1.0000e-005	1.3000e-004	1.0000e-005	1.3000e-004	3.0000e-005	1.0000e-005	4.0000e-005	0.0000	0.5542	0.5542	2.0000e-005	0.0000	0.5548
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.4300e-003**	**2.7700e-003**	**0.0105**	**4.0000e-005**	**3.9400e-003**	**3.0000e-005**	**3.9600e-003**	**1.0400e-003**	**3.0000e-005**	**1.0700e-003**	**0.0000**	**3.6560**	**3.6560**	**9.0000e-005**	**0.0000**	**3.6582**

3.10 Building Interior Construction - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.5000e-004	7.9100e-003	8.6500e-003	1.0000e-005		5.2000e-004	5.2000e-004		4.8000e-004	4.8000e-004	0.0000	1.0072	1.0072	3.3000e-004	0.0000	1.0153
Total	**8.5000e-004**	**7.9100e-003**	**8.6500e-003**	**1.0000e-005**		**5.2000e-004**	**5.2000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**1.0072**	**1.0072**	**3.3000e-004**	**0.0000**	**1.0153**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	8.5000e-004	7.9100e-003	8.6500e-003	1.0000e-005		5.2000e-004	5.2000e-004		4.8000e-004	4.8000e-004	0.0000	1.0072	1.0072	3.3000e-004	0.0000	1.0153
Total	**8.5000e-004**	**7.9100e-003**	**8.6500e-003**	**1.0000e-005**		**5.2000e-004**	**5.2000e-004**		**4.8000e-004**	**4.8000e-004**	**0.0000**	**1.0072**	**1.0072**	**3.3000e-004**	**0.0000**	**1.0153**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

3.11 Building Finishes - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1200e-003	0.0120	0.0167	2.0000e-005		6.0000e-004	6.0000e-004		5.5000e-004	5.5000e-004	0.0000	2.0898	2.0898	6.8000e-004	0.0000	2.1066
Total	**1.1200e-003**	**0.0120**	**0.0167**	**2.0000e-005**		**6.0000e-004**	**6.0000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.0898**	**2.0898**	**6.8000e-004**	**0.0000**	**2.1066**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.1200e-003	7.9100e-003	0.0167	2.0000e-005		6.0000e-004	6.0000e-004		5.5000e-004	5.5000e-004	0.0000	2.0897	2.0897	6.8000e-004	0.0000	2.1066

Total	**1.1200e-003**	**7.9100e-003**	**0.0167**	**2.0000e-005**		**6.0000e-004**	**6.0000e-004**		**5.5000e-004**	**5.5000e-004**	**0.0000**	**2.0897**	**2.0897**	**6.8000e-004**	**0.0000**	**2.1066**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.3800e-003	9.3000e-004	0.0101	3.0000e-005	3.8100e-003	2.0000e-005	3.8300e-003	1.0100e-003	2.0000e-005	1.0300e-003	0.0000	3.1018	3.1018	7.0000e-005	0.0000	3.1034
Total	**1.3800e-003**	**9.3000e-004**	**0.0101**	**3.0000e-005**	**3.8100e-003**	**2.0000e-005**	**3.8300e-003**	**1.0100e-003**	**2.0000e-005**	**1.0300e-003**	**0.0000**	**3.1018**	**3.1018**	**7.0000e-005**	**0.0000**	**3.1034**

3.12 Punch List and Final Completion - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	2.0000e-005	6.1000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1847	0.1847	1.0000e-005	0.0000	0.1849
Vendor	8.0000e-005	2.4400e-003	6.2000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.6401	0.6401	3.0000e-005	0.0000	0.6409
Worker	3.5000e-004	2.3000e-004	2.5200e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.7755	0.7755	2.0000e-005	0.0000	0.7759
Total	**4.5000e-004**	**3.2800e-003**	**3.2700e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.6003**	**1.6003**	**6.0000e-005**	**0.0000**	**1.6016**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction Off-Site

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

Hauling	2.0000e-005	6.1000e-004	1.3000e-004	0.0000	4.0000e-005	0.0000	4.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.1847	0.1847	1.0000e-005	0.0000	0.1849
Vendor	8.0000e-005	2.4400e-003	6.2000e-004	1.0000e-005	1.6000e-004	1.0000e-005	1.7000e-004	5.0000e-005	0.0000	5.0000e-005	0.0000	0.6401	0.6401	3.0000e-005	0.0000	0.6409
Worker	3.5000e-004	2.3000e-004	2.5200e-003	1.0000e-005	9.5000e-004	1.0000e-005	9.6000e-004	2.5000e-004	1.0000e-005	2.6000e-004	0.0000	0.7755	0.7755	2.0000e-005	0.0000	0.7759
Total	**4.5000e-004**	**3.2800e-003**	**3.2700e-003**	**2.0000e-005**	**1.1500e-003**	**2.0000e-005**	**1.1700e-003**	**3.1000e-004**	**1.0000e-005**	**3.2000e-004**	**0.0000**	**1.6003**	**1.6003**	**6.0000e-005**	**0.0000**	**1.6016**

AMPORTS Landside Operations

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
General Light Industry	25.33	1000sqft	0.58	25,328.00	0
Other Asphalt Surfaces	0.35	Acre	0.35	15,376.68	0
Other Non-Asphalt Surfaces	7.60	Acre	17.48	331,056.00	0
Parking Lot	20.00	Acre	20.49	871,200.00	0
User Defined Commercial	35.00	User Defined Unit	0.00	0.00	0
User Defined Industrial	14.62	User Defined Unit	0.00	0.00	0
Manufacturing	1.00	1000sqft	0.00	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Project Description. User defined industrial and commerical set for operational uses.

Construction Phase - Project Specific Construction Schedule provided by applicant

Off-road Equipment - applicant provided information

Off-road Equipment - No construction equipment, operational assessment only.

Trips and VMT - No construction vehicles, operational assessment only.

Vehicle Trips - Adjusted trip rates to equal operational trip estimates

Fleet Mix - Adjusted fleet mix to reflect actual vehicle types to be used on site.

Water And Wastewater - Applicant estimate - 500 gpd x 260 days

Landscape Equipment -

Energy Use - only 25.3 ksf building

Solid Waste - only 25.3 ksf building

Table Name	Column Name	Default Value	New Value
tblEnergyUse	LightingElect	3.08	0.00
tblEnergyUse	NT24E	3.70	0.00
tblEnergyUse	NT24NG	6.67	0.00
tblEnergyUse	T24E	1.48	0.00
tblEnergyUse	T24NG	19.71	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	HHD	0.02	1.00
tblFleetMix	HHD	0.02	0.00
tblFleetMix	LDA	0.59	0.60
tblFleetMix	LDA	0.59	0.60
tblFleetMix	LDA	0.59	0.00
tblFleetMix	LDA	0.59	0.61
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT1	0.04	0.00
tblFleetMix	LDT1	0.04	0.04
tblFleetMix	LDT2	0.19	0.20
tblFleetMix	LDT2	0.19	0.20
tblFleetMix	LDT2	0.19	0.00

tblFleetMix	LDT2	0.19	0.20
tblFleetMix	LHD1	0.02	0.01
tblFleetMix	LHD1	0.02	0.01
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD1	0.02	0.00
tblFleetMix	LHD2	5.0130e-003	0.01
tblFleetMix	LHD2	5.0130e-003	0.01
tblFleetMix	LHD2	5.0130e-003	0.00
tblFleetMix	LHD2	5.0130e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MCY	5.3510e-003	0.00
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MDV	0.12	0.14
tblFleetMix	MDV	0.12	0.00
tblFleetMix	MDV	0.12	0.15
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MH	8.0200e-004	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	MHD	0.01	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	OBUS	1.6350e-003	0.00
tblFleetMix	SBUS	2.7260e-003	0.00

tblFleetMix	SBUS	2.7260e-003	0.00
tblFleetMix	SBUS	2.7260e-003	0.00
tblFleetMix	SBUS	2.7260e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblFleetMix	UBUS	1.7420e-003	0.00
tblLandUse	LandUseSquareFeet	25,330.00	25,328.00
tblLandUse	LandUseSquareFeet	15,246.00	15,376.68
tblLandUse	LandUseSquareFeet	1,000.00	0.00
tblLandUse	LotAcreage	7.60	17.48
tblLandUse	LotAcreage	20.00	20.49
tblLandUse	LotAcreage	0.02	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblOffRoadEquipment	OffRoadEquipmentUnitAmount	2.00	0.00
tblSolidWaste	SolidWasteGenerationRate	1,860.00	0.00
tblTripsAndVMT	WorkerTripNumber	15.00	0.00
tblVehicleTrips	CC_TL	7.30	65.00
tblVehicleTrips	CC_TL	7.30	0.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CC_TTP	0.00	100.00
tblVehicleTrips	CC_TTP	28.00	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TL	7.30	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CNW_TTP	13.00	0.00
tblVehicleTrips	CW_TL	9.50	0.00
tblVehicleTrips	CW_TL	9.50	1.00
tblVehicleTrips	CW_TTP	59.00	100.00

tblVehicleTrips	CW_TTP	0.00	100.00
tblVehicleTrips	CW_TTP	59.00	100.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	DV_TP	5.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PB_TP	3.00	0.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	PR_TP	0.00	100.00
tblVehicleTrips	PR_TP	92.00	100.00
tblVehicleTrips	ST_TR	1.32	0.00
tblVehicleTrips	ST_TR	1.49	0.00
tblVehicleTrips	SU_TR	0.68	0.00
tblVehicleTrips	SU_TR	0.62	0.00
tblVehicleTrips	WD_TR	6.97	2.93
tblVehicleTrips	WD_TR	0.00	0.24
tblVehicleTrips	WD_TR	0.00	14.62
tblVehicleTrips	WD_TR	3.82	144.24
tblWater	IndoorWaterUseRate	5,857,562.50	130,000.00
tblWater	IndoorWaterUseRate	346,875,000.00	0.00

2.0 Emissions Summary

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Energy	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	185.2213	185.2213	7.4500e-003	2.0500e-003	186.0192
Mobile	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279

Waste						0.0000	0.0000		0.0000	0.0000	6.3760	0.0000	6.3760	0.3768	0.0000	15.7961
Water						0.0000	0.0000		0.0000	0.0000	0.0412	0.2046	0.2459	4.2500e-003	1.0000e-004	0.3824
Total	**0.6244**	**9.9348**	**3.8873**	**0.0614**	**1.6172**	**0.0286**	**1.6458**	**0.4437**	**0.0275**	**0.4711**	**6.4172**	**6,094.1119**	**6,100.5291**	**0.5743**	**2.1500e-003**	**6,115.5276**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Energy	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	185.2213	185.2213	7.4500e-003	2.0500e-003	186.0192
Mobile	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279
Waste						0.0000	0.0000		0.0000	0.0000	6.3760	0.0000	6.3760	0.3768	0.0000	15.7961
Water						0.0000	0.0000		0.0000	0.0000	0.0412	0.2046	0.2459	4.2500e-003	1.0000e-004	0.3824
Total	**0.6244**	**9.9348**	**3.8873**	**0.0614**	**1.6172**	**0.0286**	**1.6458**	**0.4437**	**0.0275**	**0.4711**	**6.4172**	**6,094.1119**	**6,100.5291**	**0.5743**	**2.1500e-003**	**6,115.5276**

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

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279
Unmitigated	0.4044	9.9021	3.8588	0.0612	1.6172	0.0261	1.6433	0.4437	0.0250	0.4686	0.0000	5,908.6841	5,908.6841	0.1858	0.0000	5,913.3279

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	74.22	0.00	0.00	183,316	183,316
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	8.40	0.00	0.00	20,748	20,748
User Defined Industrial	213.74	0.00	0.00	3,612,280	3,612,280
Manufacturing	144.24	0.00	0.00	37,502	37,502
Total	440.60	0.00	0.00	3,853,847	3,853,847

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
General Light Industry	9.50	7.30	7.30	100.00	0.00	0.00	100	0	0
Other Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Other Non-Asphalt Surfaces	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
Parking Lot	9.50	7.30	7.30	0.00	0.00	0.00	0	0	0
User Defined Commercial	9.50	7.30	7.30	100.00	0.00	0.00	100	0	0
User Defined Industrial	0.00	65.00	0.00	0.00	100.00	0.00	100	0	0
Manufacturing	1.00	0.00	0.00	100.00	0.00	0.00	100	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
General Light Industry	0.600000	0.040000	0.200000	0.140000	0.010000	0.010000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Other Asphalt Surfaces	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802
Other Non-Asphalt Surfaces	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802
Parking Lot	0.590657	0.037535	0.185105	0.118290	0.015611	0.005013	0.010768	0.024764	0.001635	0.001742	0.005351	0.002726	0.000802
User Defined Commercial	0.600000	0.040000	0.200000	0.140000	0.010000	0.010000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
User Defined Industrial	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Manufacturing	0.610000	0.040000	0.200000	0.150000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	149.5661	149.5661	6.7600e-003	1.4000e-003	150.1522
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	149.5661	149.5661	6.7600e-003	1.4000e-003	150.1522
NaturalGas Mitigated	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671
NaturalGas Unmitigated	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	668153	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**3.6000e-003**	**0.0328**	**0.0275**	**2.0000e-004**		**2.4900e-003**	**2.4900e-003**		**2.4900e-003**	**2.4900e-003**	**0.0000**	**35.6552**	**35.6552**	**6.8000e-004**	**6.5000e-004**	**35.8671**

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
General Light Industry	668153	3.6000e-003	0.0328	0.0275	2.0000e-004		2.4900e-003	2.4900e-003		2.4900e-003	2.4900e-003	0.0000	35.6552	35.6552	6.8000e-004	6.5000e-004	35.8671
Manufacturing	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**3.6000e-003**	**0.0328**	**0.0275**	**2.0000e-004**		**2.4900e-003**	**2.4900e-003**		**2.4900e-003**	**2.4900e-003**	**0.0000**	**35.6552**	**35.6552**	**6.8000e-004**	**6.5000e-004**	**35.8671**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	209209	60.8614	2.7500e-003	5.7000e-004	61.0999
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	304920	88.7047	4.0100e-003	8.3000e-004	89.0523
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**149.5661**	**6.7600e-003**	**1.4000e-003**	**150.1522**

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
General Light Industry	209209	60.8614	2.7500e-003	5.7000e-004	61.0999
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	304920	88.7047	4.0100e-003	8.3000e-004	89.0523
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**149.5661**	**6.7600e-003**	**1.4000e-003**	**150.1522**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Unmitigated	0.2163	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003

6.2 Area by SubCategory

Unmitigated

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

Architectural Coating	0.0386					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1776					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.0000e-005	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Total	**0.2163**	**1.0000e-005**	**9.5000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.8600e-003**	**1.8600e-003**	**0.0000**	**0.0000**	**1.9800e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0386					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.1776					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	9.0000e-005	1.0000e-005	9.5000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.8600e-003	1.8600e-003	0.0000	0.0000	1.9800e-003
Total	**0.2163**	**1.0000e-005**	**9.5000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.8600e-003**	**1.8600e-003**	**0.0000**	**0.0000**	**1.9800e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.2459	4.2500e-003	1.0000e-004	0.3824
Unmitigated	0.2459	4.2500e-003	1.0000e-004	0.3824

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			

General Light Industry	0.13 / 0	0.2459	4.2500e-003	1.0000e-004	0.3824
Manufacturing	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.2459**	**4.2500e-003**	**1.0000e-004**	**0.3824**

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
General Light Industry	0.13 / 0	0.2459	4.2500e-003	1.0000e-004	0.3824
Manufacturing	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0 / 0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.2459**	**4.2500e-003**	**1.0000e-004**	**0.3824**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	6.3760	0.3768	0.0000	15.7961
Unmitigated	6.3760	0.3768	0.0000	15.7961

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
General Light Industry	31.41	6.3760	0.3768	0.0000	15.7961
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**6.3760**	**0.3768**	**0.0000**	**15.7961**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			

General Light Industry	31.41	6.3760	0.3768	0.0000	15.7961
Manufacturing	0	0.0000	0.0000	0.0000	0.0000
Other Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Other Non-Asphalt Surfaces	0	0.0000	0.0000	0.0000	0.0000
Parking Lot	0	0.0000	0.0000	0.0000	0.0000
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
User Defined Industrial	0	0.0000	0.0000	0.0000	0.0000
Total		**6.3760**	**0.3768**	**0.0000**	**15.7961**

9.0 Operational Offroad

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

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

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

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

AMPORTS Project Construction Assumptions

Wharf Side - Unmitigated Project Construction

Construction Phase Phase Name	Start Date	End Date	Num Days Week	Num Days
Mobilization	2021/09/01	2021/09/01	5	1
Deck Construction - Demc	2021/09/03	2021/09/07	5	3
Pile Driving	2021/09/06	2021/11/30	5	62
Deck Construction - New I	2021/11/03	2022/02/08	5	70
Fenders, Wharf Appurten:	2021/11/30	2022/03/15	5	76
Punch List and Final Comp	2022/03/30	2022/04/12	5	10

OffRoad Equipment Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Plie Driving	Excavators	1	5	1050	0.6
Pile Driving	Excavators	1	3	300	0.6

Trips and VMT Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip	Hauling Trip
Mobilization	10	1	2	10.8	7.3	20
Deck Construction - Demc	10	0	0	10.8	7.3	20
Pile Driving	10	0	56	10.8	7.3	20
Deck Construction - New I	10	0	3	10.8	7.3	20
Fenders, Wharf Appurten:	10	0	3	10.8	7.3	20
Punch List and Final Comp	10	1	2	10.8	7.3	20

AMPORTS Project—Energy Consumption Summary

Summary of Energy Use During Construction		Total
Construction vehicle fuel	8,322	gallons (gasoline, diesel)
Construction equipment fuel	11,512	gallons (diesel)
Summary of Energy Use During Proposed Operations		(Annually)
Operational vehicle fuel consumption	390,715	gallons (gasoline, diesel)
Operational vessel fuel use	286,623	gallons (marine distillate)
Operational vessel fuel use	6,201	gallons (residual oil)
Operational natural gas consumption	668,153	kilo-British Thermal Units
Operational electricity consumption	514,129	kilowatt hours

Construction Vehicle Fuel Calculations (Page 1 of 2)

California Air Resource Board (ARB). 2021. EMFAC2014 Web Database. Website: https://www.arb.ca.gov/emfac/2014/. Accessed March 6, 2021.

EMFAC2014 (v1.0.7) Emissions Inventory
Region Type: Sub-Area
Region: Contra Costa (SF)
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled
FE = Fuel Economy

			Given						*Calculations*	
Region	Calendar Year	Vehicle Class	Model Year	Speed	Fuel	Population	VMT (mi/day)	Fuel Consumption (1000 gallons/day)	FE (mi/gallon)	VMT*FE
Contra Costa (SF)	2023	HHDT	Aggregated	Aggregated	GAS	37.6150949	5223.501	1.077856849	4.846191792	25314.088
Contra Costa (SF)	2023	HHDT	Aggregated	Aggregated	DSL	4418.44028	631969.32	102.0600966	6.19212934	3913235.8
Contra Costa (SF)	2023	LDA	Aggregated	Aggregated	GAS	389263.524	14156393	442.2641263	32.00891124	453130732
Contra Costa (SF)	2023	LDA	Aggregated	Aggregated	DSL	4641.43	171648.82	4.222914934	40.64699913	6977009.4
Contra Costa (SF)	2023	LDT1	Aggregated	Aggregated	GAS	27194.1328	964757.21	35.47658782	27.19419389	26235795
Contra Costa (SF)	2023	LDT1	Aggregated	Aggregated	DSL	25.4315851	631.81637	0.020013168	31.57003209	19946.463
Contra Costa (SF)	2023	LDT2	Aggregated	Aggregated	GAS	120540.327	4753181.8	195.7083872	24.28706224	115440822
Contra Costa (SF)	2023	LDT2	Aggregated	Aggregated	DSL	227.679007	9675.6236	0.304478451	31.77769597	307469.03
Contra Costa (SF)	2023	LHDT1	Aggregated	Aggregated	GAS	6346.64513	184360.37	18.95741407	9.724974684	1792899.9
Contra Costa (SF)	2023	LHDT1	Aggregated	Aggregated	DSL	6422.44681	217307.37	12.21868361	17.78484332	3864777.6
Contra Costa (SF)	2023	LHDT2	Aggregated	Aggregated	GAS	1012.94298	38305.24	4.264880431	8.981550629	344040.45
Contra Costa (SF)	2023	LHDT2	Aggregated	Aggregated	DSL	2312.94001	90669.218	5.602449883	16.18385171	1467377.2
Contra Costa (SF)	2023	MDV	Aggregated	Aggregated	GAS	84762.8948	2979648.7	168.6988176	17.66253476	52628149
Contra Costa (SF)	2023	MDV	Aggregated	Aggregated	DSL	1498.1469	64023.643	2.642165564	24.23150312	1551389.1
Contra Costa (SF)	2023	MHDT	Aggregated	Aggregated	GAS	741.84873	41032.267	6.250953667	6.564161162	269342.42
Contra Costa (SF)	2023	MHDT	Aggregated	Aggregated	DSL	4943.18308	236030.86	28.06056014	8.411480565	1985369

Worker
Weighted Average Fuel Economy 28.410928

Vendor
Weighted Average Fuel Economy 9.4555844

Haul
Weighted Average Fuel Economy 6.1810958

Construction Vehicle Fuel Calculations (Page 2 of 2)

Construction Schedule

Source: CalEEMod Output

Amports - Wharfside

CalEEMod Run	Phase Name	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	2021/09/01	2021/09/01	5	1
Project Construction	Deck Construction - Demo	2021/09/03	2021/09/07	5	3
Project Construction	Pile Driving	2021/09/06	2021/11/30	5	62
Project Construction	Deck Construction - New Dec	2021/11/03	2022/02/08	5	70
Project Construction	Fenders, Wharf Appurtenanc	2021/11/30	2022/03/15	5	76
	Punch List and Final Complet	2022/03/30	2022/04/12	5	10

Construction Trips and VMT

	Trips per Day		Total Trips	Construction Trip Length in Miles				Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Number of Days per Phase	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
Mobilization	10	1	2	10.8	7.3	20	1	10	1	2	108	7	40	3.80	0.77	6.47
Deck Construction - Demo	10	0	0	10.8	7.3	20	3	30	0	0	324	0	0	11.40	0.00	0.00
Pile Driving	10	0	56	10.8	7.3	20	62	620	0	56	6,696	0	1,120	235.68	0.00	181.20
Deck Construction - New Deck	10	0	3	10.8	7.3	20	70	700	0	3	7,560	0	60	266.09	0.00	9.71
Fenders, Wharf Appurtenances, Utilities	10	0	3	10.8	7.3	20	20	200	0	3	2,160	0	60	76.03	0.00	9.71
Punch List and Final Completion	10	1	2	10.8	7.3	20	76	760	76	2	8,208	555	40	288.90	58.67	6.47

Total Project Construction VMT (miles)

26,938

Total Project Fuel Consumption (gallons)

1,155

Construction Vehicle Fuel Calculations (Page 2 of 2)

Construction Schedule

Source: CalEEMod Output

Amports - Landside

CalEEMod Run	Phase Name	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	12/16/2021	2021/12/22	5	5
Project Construction	Erosion Control	2021/12/23	2021/12/29	5	5
Project Construction	Demolition	2021/12/30	2022/01/05	5	5
Project Construction	Utilities	2022/01/06	2022/03/30	5	60
Project Construction	Construct Building Foundatio	2022/03/31	2022/06/01	5	45
Project Construction	Site Paving	2022/03/31	2022/06/22	5	60
Project Construction	Erect Light Poles	2022/03/31	2022/04/27	5	20
Project Construction	Erect Pre-Engineered Metal E	2022/06/10	2022/07/07	5	20
Project Construction	Building Interior Constructior	2022/07/08	2022/08/04	5	20
Project Construction	Building Finishes	2022/08/05	2022/09/01	5	20
Project Construction	Punch List and Final Complet	2022/09/02	2022/09/08	5	5

Construction Trips and VMT

	Trips per Day		Total Trips	Construction Trip Length in Miles				Trips per Phase			VMT per Phase			Fuel Consumption (gallons)		
Phase Name	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Number of Days per Phase	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trips	Vendor Trips	Hauling Trips	Worker Trips	Vendor Trips	Hauling Trips
Mobilization	48	10	5	10.8	7.3	20	5	240	50	5	2,592	365	100	91.23	38.60	16.18
Erosion Control	48	10	0	10.8	7.3	20	5	240	50	0	2,592	365	0	91.23	38.60	0.00
Demolition	48	10	10	10.8	7.3	20	5	240	50	10	2,592	365	200	91.23	38.60	32.36
Utilities	48	6	30	10.8	7.3	20	60	2,880	360	30	31,104	2,628	600	1,094.79	277.93	97.07
Construct Building Foundations	48	0	108	10.8	7.3	20	45	2,160	0	108	23,328	0	2,160	821.09	0.00	349.45
Site Paving	48	0	399	10.8	7.3	20	60	2,880	0	399	31,104	0	7,980	1,094.79	0.00	1,291.03
Erect Light Poles	48	0	15	10.8	7.3	20	20	960	0	15	10,368	0	300	364.93	0.00	48.54
Erect Pre-Engineered Metal Building	48	0	15	10.8	7.3	20	20	960	0	15	10,368	0	300	364.93	0.00	48.54
Building Interior Construction	48	0	0	10.8	7.3	20	20	960	0	0	10,368	0	0	364.93	0.00	0.00
Building Finishes	48	0	0	10.8	7.3	20	20	960	0	0	10,368	0	0	364.93	0.00	0.00
Punch List and Final Completion	48	10	5	10.8	7.3	20	5	240	50	5	2,592	365	100	91.23	38.60	16.18

Total Project Construction VMT (miles)

153,204

Total Project Fuel Consumption (gallons)

7,167

Construction Equipment Fuel Calculation (Page 2 of 2)

OFFROAD2017 (v1.0.1) Emissions Inventory
Region Type: Sub-Area
Region: Contra Costa (SF)
Calendar Year: 2023
Scenario: All Adopted Rules - Exhaust
Vehicle Classification: OFFROAD2017 Equipment Types
Units: Emissions: tons/day, Fuel Consumption: gallons/year, Activity: hours/year, HP-Hours: HP-hours/year

CalYr	Vehicle Class	Model Year	HP_Bin	Fuel	Fuel (gallons/year)	Horsepower Hours (HP-hours/year)	Fuel (gallons/HP-hour)
2021	ConstMin - Cranes	Aggregated	75	Diesel	206.2177	13756.50131	0.014990567
2021	ConstMin - Excavators	Aggregated	175	Diesel	191022.9451	9666442.07565	0.019761453
2021	ConstMin - Graders	Aggregated	175	Diesel	116102.9888	5470452.23039	0.021223655
2021	ConstMin - Pavers	Aggregated	175	Diesel	25245.8603	1172690.18101	0.021528159
2021	ConstMin - Paving Equipment	Aggregated	175	Diesel	10682.9508	582991.79989	0.018324359
2021	ConstMin - Rollers	Aggregated	100	Diesel	60929.0170	3138772.52784	0.019411734
2021	ConstMin - Rough Terrain Forklifts	Aggregated	100	Diesel	156870.3441	7536664.80425	0.020814292
2021	ConstMin - Rubber Tired Dozers	Aggregated	300	Diesel	8511.9241	415570.77441	0.02048249
2021	ConstMin - Scrapers	Aggregated	300	Diesel	71097.1231	2852562.44175	0.02492395
2021	ConstMin - Tractors/Loaders/Backhoes	Aggregated	175	Diesel	163710.9151	8620823.02549	0.018990172
2021	OFF - ConstMin - Cement and Mortar Mixers	Aggregated	300	Diesel	102736.2000	5401945.43171	0.019018371
2021	OFF - ConstMin - Concrete/Industrial Saws	Aggregated	100	Diesel	13561.7178	520648.28542	0.026047753
2021	OFF - Light Commercial - Generator Sets	Aggregated	25	Diesel	2909.0500	91038.30000	0.031954134
2021	OFF - Light Commercial - Welders	Aggregated	50	Diesel	1481.9000	35291.85000	0.041989865
2021	ConstMin - Trenchers	Aggregated	50	Diesel	70926.8000	1675459.50000	0.042332745
2021	OFF - Light Commercial - Air Compressors	Aggregated	50	Diesel	118157.8000	4575442.90000	0.025824342

Construction Equipment Fuel Calculation (Page 1 of 2)

Source: CalEEMod Output
Amports - Wharf Side
Construction Schedule

Construction Area	Phase Type	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	2021/09/01	2021/09/01	5	1
Project Construction	Deck Construction - Demo	2021/09/03	2021/09/07	5	3
Project Construction	Pile Driving	2021/09/06	2021/11/30	5	62
Project Construction	Deck Construction - New Deck	2021/11/03	2022/02/08	5	70
Project Construction	Fenders, Wharf Appurtenances, Utilities	2021/11/30	2022/03/15	5	76
	Punch List and Final Completion	2022/03/30	2022/04/12	5	10

Construction Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Fuel (gallons/HP-	Diesel Fuel Usage
Pile Driving	Excavators	1	5	1050	0.6	62	195,300.00	0.020	3,859.41
Pile Driving	Excavators	1	3	300	0.60	62	33,480.00	0.020	661.61

Total Construction Equipment Fuel Consumption (gallons) **4,521.03**

Notes:
Equipment assumptions are provided in the CalEEMod output files.
Source of usage estimates: California Air Resource Board (ARB). 2021. OFFROAD2017 (v1.0.1) Emissions Inventory
Website: https://www.arb.ca.gov/orion/. Accessed March 9, 2021.

Construction Equipment Fuel Calculation (Page 1 of 2)

Source: CalEEMod Output
Amports - Wharf Side
Construction Schedule

Construction Area	Phase Type	Start Date	End Date	Num Days Week	Num Days
Project Construction	Mobilization	2021/12/16	2021/12/22	5	5
Project Construction	Erosion Control	2021/12/23	2021/12/29	5	5
Project Construction	Demolition	2021/12/30	2022/01/05	5	5
Project Construction	Utilities	2022/01/06	2022/03/30	5	60
Project Construction	Construct Building Foundations	2022/03/31	2022/06/01	5	45
Project Construction	Site Paving	2022/03/31	2022/06/22	5	60
Project Construction	Erect Light Poles	2022/03/31	2022/04/27	5	20
Project Construction	Erect Pre-Engineered Metal Building	2022/06/10	2022/07/07	5	20
Project Construction	Building Interior Construction	2022/07/08	2022/08/04	5	20
Project Construction	Building Finishes	2022/08/05	2022/09/01	5	20
	Punch List and Final Completion	2022/09/02	2022/09/08	5	5

Construction Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor	Number of Days	HP Hours	Fuel (gallons/HP-	Diesel Fuel Usage
Demolition	Concrete/Industrial Saws	2	6	40	0.73	5	1,752.00	0.026	45.64
Demolition	Excavators	1	6	162	0.38	5	1,846.80	0.020	36.50
Demolition	Rubber Tired Dozers	1	6	247	0.4	4	2,371.20	0.020	48.57
Demolition	Tractors/Loaders/Backhoes	2	6	97	0.37	4	1,722.72	0.019	32.71
Utilities	Excavators	1	6	162	0.38	60	22,161.60	0.020	437.95
Utilities	Plate Compactors	1	6	8	0.43	60	1,238.40	0.018	22.69
Utilities	Rollers	1	6	80	0.38	60	10,944.00	0.019	212.44
Utilities	Tractors/Loaders/Backhoes	2	6	97	0.37	60	25,840.80	0.019	490.72
Construct Building Foundations	Excavators	1	6	162	0.38	45	16,621.20	0.020	328.46
Construct Building Foundations	Rollers	1	6	80	0.38	45	8,208.00	0.018	150.41
Construct Building Foundations	Tractors/Loaders/Backhoes	2	6	97	0.37	45	19,380.60	0.019	368.04
Site Paving	Pavers	2	6	130	0.42	60	39,312.00	0.022	846.31
Site Paving	Rollers	2	6	80	0.38	60	21,888.00	0.018	401.08
Site Paving	Surfacing Equipment	2	6	225	0.78	60	126,360.00	0.018	2,315.47
Site Paving	Tractors/Loaders/Backhoes	2	6	97	0.37	20	8,613.60	0.019	163.57
Erect Light Poles	Cranes	1	6	226	0.29	20	7,864.80	0.015	117.90
Erect Pre-Engineered Metal Building	Cranes	1	6	226	0.29	20	7,864.80	0.015	117.90
Erect Pre-Engineered Metal Building	Forklifts	2	6	89	0.2	20	4,272.00	0.021	88.92
Erect Pre-Engineered Metal Building	Generator Sets	1	6	84	0.74	20	7,459.20	0.021	158.31
Erect Pre-Engineered Metal Building	Tractors/Loaders/Backhoes	2	6	97	0.37	20	8,613.60	0.018	157.84
Erect Pre-Engineered Metal Building	Welders	3	6	46	0.45	20	7,452.00	0.042	312.91
Building Interior Construction	Forklifts	1	6	89	0.2	20	2,136.00	0.021	44.46
Building Finishes	Aerial Lifts	1	6	62	0.31	20	2,306.40	0.021	48.01
Building Finishes	Forklifts	1	6	89	0.2	20	2,136.00	0.021	44.46

Total Construction Equipment Fuel Consumption (gallons) **6,991.26**

Notes:
Equipment assumptions are provided in the CalEEMod output files.
Source of usage estimates: California Air Resource Board (ARB). 2021. OFFROAD2017 (v1.0.1) Emissions Inventory
Website: https://www.arb.ca.gov/orion/. Accessed March 9, 2021.

Operational Fuel Calculation—Project-generated Operational Trips (Page 1 of 2)

California Air Resource Board (ARB). 2021. EMFAC2014 Web Database. Website: https://www.arb.ca.gov/emfac/2014/. Accessed March 6, 2021.

EMFAC2014 (v1.0.7) Emissions Inventory
Region Type: Sub-Area
Region: Contra Costa (SF)
Calendar Year: 2023
Season: Annual
Vehicle Classification: EMFAC2007 Categories
Units: miles/day for VMT, trips/day for Trips, tons/day for Emissions, 1000 gallons/day for Fuel Consumption

VMT = Vehicle Miles Traveled
FE = Fuel Economy

			Given						*Calculations*	
Region	Calendar Year	Vehicle Class	Model Year	Speed	Fuel	Population	VMT	Fuel Consumption	FE	VMT*FE
Contra Costa (SF)	2024	LDA	Aggregated	Aggregated	GAS	393625.1546	14205347.02	430.0842875	33.02921644	469191481.4
Contra Costa (SF)	2024	LDA	Aggregated	Aggregated	DSL	4792.34496	175962.4878	4.196646084	41.92931315	7377986.254
								Weighted Average Fuel Economy		**33.13811356**
Contra Costa (SF)	2024	LDT1	Aggregated	Aggregated	GAS	26928.77275	958636.6619	33.91320326	28.26735813	27098125.84
Contra Costa (SF)	2024	LDT1	Aggregated	Aggregated	DSL	24.60611217	620.7650713	0.018959695	32.74130033	20324.65563
Contra Costa (SF)	2024	LDT2	Aggregated	Aggregated	GAS	122058.9098	4794103.583	189.7538443	25.26485616	121122337.4
Contra Costa (SF)	2024	LDT2	Aggregated	Aggregated	DSL	238.8986269	9963.290167	0.303446977	32.83371037	327131.7837
Contra Costa (SF)	2024	MDV	Aggregated	Aggregated	GAS	84111.16323	2951928.214	161.2725139	18.30397593	54032022.98
Contra Costa (SF)	2024	MDV	Aggregated	Aggregated	DSL	1581.491785	66308.26364	2.648749731	25.03379721	1659947.626
								Weighted Average Fuel Economy		**23.26008958**
Contra Costa (SF)	2024	LHDT1	Aggregated	Aggregated	GAS	6025.808733	173705.1984	17.79303557	9.762538701	1695803.722
Contra Costa (SF)	2024	LHDT1	Aggregated	Aggregated	DSL	6359.011944	213921.0313	11.93812365	17.91915024	3833283.1
Contra Costa (SF)	2024	LHDT2	Aggregated	Aggregated	GAS	1008.173029	38122.20741	4.220619404	9.032372683	344333.9849
Contra Costa (SF)	2024	LHDT2	Aggregated	Aggregated	DSL	2336.905436	91089.22171	5.581350423	16.32028359	1486601.93
Contra Costa (SF)	2024	MHDT	Aggregated	Aggregated	GAS	759.2136247	42082.28319	6.381863907	6.594042713	277492.3728
Contra Costa (SF)	2024	MHDT	Aggregated	Aggregated	DSL	5138.436094	237804.2715	28.19859594	8.433195468	2005449.905
Contra Costa (SF)	2024	HHDT	Aggregated	Aggregated	GAS	38.91827493	5427.614385	1.111616064	4.882633995	26501.05451
Contra Costa (SF)	2024	HHDT	Aggregated	Aggregated	DSL	4571.338357	644239.859	103.4479001	6.227674593	4012116.201
								Weighted Average Fuel Economy		**9.459112904**
Contra Costa (SF)	2024	MCY	Aggregated	Aggregated	GAS	18331.52239	137738.8613	3.73511025	36.87678598	5079366.508
								Weighted Average Fuel Economy		**36.87678598**
Contra Costa (SF)	2024	MH	Aggregated	Aggregated	GAS	1823.569806	15460.96399	2.301153573	6.718788425	103878.9459
Contra Costa (SF)	2024	MH	Aggregated	Aggregated	DSL	531.8204632	4581.013111	0.4716322	9.713105066	44495.86166
Contra Costa (SF)	2024	OBUS	Aggregated	Aggregated	GAS	432.0997018	24797.25226	3.705461456	6.692082094	165945.2478
Contra Costa (SF)	2024	OBUS	Aggregated	Aggregated	DSL	223.9196894	17808.26458	2.408849532	7.392850549	131653.8386
Contra Costa (SF)	2024	SBUS	Aggregated	Aggregated	GAS	99.30917763	4882.288382	0.407881599	11.96986672	58440.34121
Contra Costa (SF)	2024	SBUS	Aggregated	Aggregated	DSL	1734.517915	65665.27027	9.003692702	7.29314876	478906.5844
Contra Costa (SF)	2024	UBUS	Aggregated	Aggregated	GAS	151.4328428	22095.33075	4.401038074	5.020481618	110929.2019
Contra Costa (SF)	2024	UBUS	Aggregated	Aggregated	DSL	152.4722179	22246.98436	4.916857659	4.524634616	100659.4755
								Weighted Average Fuel Economy		**6.730467577**

Operational Fuel Calculation—Project-generated Operational Trips (Page 2 of 2)

Total Operational VMT

AMPORTS - Passenger Vehicles

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	74.22	0.00	0.00	183,316	183,316
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	8.40	0.00	0.00	20,748	20,748
User Defined Industrial	213.74	0.00	0.00	3,612,280	3,612,280
Manufacturing	144.24	0.00	0.00	37,502	37,502
Total	440.60	0.00	0.00	3,853,847	3,853,847

	Annual VMT (miles)
Total VMT	**241,566**

By Vehicle Type

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.600000	0.040000	0.200000	0.140000	0.010000	0.010000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000

	Fraction of 1	Percent of Vehicle Trips	Annual VMT	Daily VMT	Average Fuel Economy (miles/gallon)	Total Daily Fuel Consumption (gallons)	Total Annual Fuel Consumption (gallons)
Passenger Cars (LDA)	0.6000	60.0	144,940	397	33.14	12.0	4,374
Light Trucks and Medium Vehicles (LDT1, LDT2, and MDV)	0.3800	38.0	91,795	251	23.26	10.8	3,946
Light-Heavy to Heavy-Heavy Diesel Trucks	0.0200	2.0	4,831	13	9.46	1.4	511
Motorcycles	0.0000	0.0	0	0	36.88	0.0	0
Other	0.0000	0.0	0	0	6.73	0.0	0
Total	**—**	**100**	**241,566**	**662**	**—**	**—**	**8,831**

Operational Fuel Calculation—Project-generated Operational Trips (Page 2 of 2)

Total Operational VMT

AMPORTS - Passenger Vehicles

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
General Light Industry	74.22	0.00	0.00	183,316	183,316
Other Asphalt Surfaces	0.00	0.00	0.00		
Other Non-Asphalt Surfaces	0.00	0.00	0.00		
Parking Lot	0.00	0.00	0.00		
User Defined Commercial	8.40	0.00	0.00	20,748	20,748
User Defined Industrial	213.74	0.00	0.00	3,612,280	3,612,280
Manufacturing	144.24	0.00	0.00	37,502	37,502
Total	440.60	0.00	0.00	3,853,847	3,853,847

	Annual VMT (miles)
Total VMT	**3,612,280**

By Vehicle Type

LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	1.000000	0.000000	0.000000	0.000000	0.000000	0.000000

	Fraction of 1	Percent of Vehicle Trips	Annual VMT	Daily VMT	Average Fuel Economy (miles/gallon)	Total Daily Fuel Consumption (gallons)	Total Annual Fuel Consumption (gallons)
Passenger Cars (LDA)	0.0000	0.0	0	0	33.14	0.0	0
Light Trucks and Medium Vehicles (LDT1, LDT2, and MDV)	0.0000	0.0	0	0	23.26	0.0	0
Light-Heavy to Heavy-Heavy Diesel Trucks	1.0000	100.0	3,612,280	9,897	9.46	1046.3	381,884
Motorcycles	0.0000	0.0	0	0	36.88	0.0	0
Other	0.0000	0.0	0	0	6.73	0.0	0
Total	**—**	**100**	**3,612,280**	**9,897**	**—**	**—**	**381,884**

Project Operations Natural Gas Use

Source: CalEEMod Output

Amports

kBTU/yr = kilo-British Thermal Units/year

	Natural Gas Use (kBTU/yr)
General Light Industry	668,153
Total	**668,153 kBTU/yr**

Project Operations Electricity Use

Source: CalEEMod Output

Amports

kWh/yr = kilowatt hours per year

	Electricity Use (kWh/yr)	
General Light Industry	209,209	
Parking Lot	304,920	
Total	**514,129**	**kWh/yr**

Marine Vessels

Table II-10 Fuel Consumption Rates (g/kW-hr)

Engine	Engine Speed	Mode	Fuel	Fuel Use Rate
Auxiliary	All	All	Marine Distillate	217
	All	All	Residual	227
Boiler	N. A.	All	Residual	305
Main	High	Transit	Residual	213
	Medium	Transit	Marine Distillate	203
	Slow	Transit	Marine Distillate	185
	Medium	Transit	Residual	213
	Slow	Transit	Residual	195
	High	Maneuvering	Residual	213
	Medium	Maneuvering	Marine Distillate	203
	Slow	Maneuvering	Marine Distillate	185
	Medium	Maneuvering	Residual	213
	Slow	Maneuvering	Residual	195

Average Vessel Characteristics (CARB 2011)

Vessel Type	Speed	Main Power	Auxiliary Power	Boiler Power
	(knots)	(kilowatts)		
Auto	19	11,593	2,999	278

# of vessels 25

grams to g 0.000264

Auto Carriers - Main Engines

Mode	Nautical Miles	Vessel Speed knots	Inbound Hours	Outbound Hours	Total Time in Mode	Total kW-hrs	g/kW-hr	Total Gallons
Transit	60	12	5.00	5.00	10.00	2898250	203	155424.2
Transit - low speed	2	7	0.29	0.29	0.57	165614.3	185	8093.872
Maneuveri	1	7	0.14	0.14	0.29	82807.14	185	4046.936
Hoteling	N/A	N/A	6.50		8.50	2463513		
Total								167,565

Auto Carriers - Auxiallry Engines

Mode	Nautical Miles	Vessel Speed knots	Inbound Hours	Outbound Hours	Total Time in Mode	Total kW-hrs	g/kW-hr	Total Gallons
Transit	60	12	5.00	5.00	10.00	749750	217	42979.66
Transit - low speed	2	7	0.29	0.29	0.57	42842.86	217	2455.981
Maneuveri	1	7	0.14	0.14	0.29	21421.43	217	1227.99
Hoteling	N/A	N/A	6.50		8.50	637287.5		
Total								46,664

Auto Carriers - Boilers

Mode	Nautical Miles	Vessel Speed knots	Inbound Hours	Outbound Hours	Total Time in Mode	Total kW-hrs	g/kW-hr	Total Gallons
Transit	0	0	0.00	0.00	0.00	0	0	0
Transit - low speed	0	0	0	0	0	0	0	0
Maneuveri	0	0	0	0	0	0	0	0
Hoteling	N/A	N/A	0.00		8.50	59075	305	4759.818
Total								4,760

Total Fuel Use Auto Carriers **218,988**

Marine Vessels

Table II-10 Fuel Consumption Rates (g/kW-hr)

Engine	Engine Speed	Mode	Fuel	Fuel Use Rate
Auxiliary	All	All	Marine Distillate	217
	All	All	Residual	227
Boiler	N. A.	All	Residual	305
Main	High	Transit	Residual	213
	Medium	Transit	Marine Distillate	203
	Slow	Transit	Marine Distillate	185
	Medium	Transit	Residual	213
	Slow	Transit	Residual	195
	High	Maneuvering	Residual	213
	Medium	Maneuvering	Marine Distillate	203
	Slow	Maneuvering	Marine Distillate	185
	Medium	Maneuvering	Residual	213
	Slow	Maneuvering	Residual	195

Vessel	QTY	HP	Load Factor	Total Assists	Hours Inbound	Hours Outbound	Total Hours in Transit	Total Hours in Transit Per Year	Hours at Berth	Total Hours at Berth Per Year
Tug Boats	2	4344	0.31	25	5.5	5.5	11	275	0	0
Tug Boiler	2	128	0.43	25	0	0	0	0	6.5	162.5

grams to g 0.000264

Tug and Barge Main Engine Fuel Use

Source	QTY	HP	LF	Hours of Use	g/kW-hr	Gallons
Tugs	2	4344	0.31	275	185	36197.01

Tug and Barge Auxiliary Engine Fuel Use

Source	QTY	HP	LF	Hours of Use	g/kW-hr	Gallons
Tugs	2	4344	0.31	275	185	36197.01

Tug and Barge Boiler Fuel Use

Source	QTY	HP	LF	Hours of Use	g/kW-hr	Gallons
Tugs	2	128	0.43	162.5	305	1441.28

Total 73,835

Stantec

Memo

To:	Zoe Meridith City of Antioch	From:	Elena Nuno Walnut Creek
File:	185705365	Date:	June 17, 2021

Reference: AMPORTS Antioch Auto Processing Facility – Sewer Line Installation

After completion of the air quality modeling for the proposed AMPORTS Antioch Auto Processing Facility Project (Project) it was determined that there was not an existing sewer line within Wilbur Avenue that the Project would be able to tie into and a new line would need to be extended from the site frontage to Viera. This memo provides the additional air quality modeling to account for this project component.

The new sewer line would be approximately 0.3 miles in length or 1,584 feet. A 20 foot area of disturbance was assumed to allow for excavation and installation of the new sewer line. It was assumed that any excavated soil would be balanced on-site or compacted into the sewer trench. The sewer line was assumed to progress construction at an estimated 100 linear feet per day based on experience with similar utility line installations for a total of 15.84 days; the total construction period was rounded up to 20 days to provide a conservative estimate.

Table 1 provides a summary of the offroad construction equipment for the sewer line installation. Up to 10 construction workers would be on-site for the duration of the installation. Table 2 provides a summary of the emissions estimate.

Table 1: Construction Equipment and Average Activity

Phase	Equipment Type	CalEEMod Equivalent	Horsepower	Hours per 100 feet	Total Project Hours
Grading	Grader	Grader	187	1.6	32
	Backhoe	Tractor/Loader/Backhoe	97	2.7	54
Trenching	Excavator	Excavator	158	2.7	54
	Loaders (2)	Tractor/Loader/Backhoe	108	5.3	106
	Water Truck	Water Truck	402	2.7	54
Paving	Grinder	Crushing/Processing Equipment	85	1	20
	Paver	Paver	130	1.6	32
	Roller (2)	Roller	80	3.3	66
	Compactor	Plate Compactor	8	2.7	54

Reference: **AMPORTS Antioch Auto Processing Facility – Sewer Line Installation**

Table 2: Estimated Construction Emissions – Sewer Line Installation

Year	ROG	NO_X	PM10 Exhaust	PM2.5 Exhaust	MTCO2e
2022	0.0094	0.0818	0.00391	0.00362	16.79

The revised emissions for the construction of the project are shown in Table 3.

Table 3: Construction Emissions – Wharfside, Landside, and Sewer Pipeline Construction

Year	ROG	NO_X	PM10 Exhaust	PM2.5 Exhaust	$MTCO_2e$
2021	0.25	1.67	0.06	0.05	104.08
2022	0.36	2.64	0.10	0.10	340.45
Total Tons	0.60	4.32	0.16	0.15	444.52
Total Pounds	1202.98	8633.05	315.96	303.96	N/A
Average Daily Construction Emissions in Pounds	5.73	41.11	1.50	1.45	N/A
BAAQMD Threshold of Significance (average pounds/day)	54	54	82	54	N/A
Significant?	No	No	No	No	N/A

Attachment: CalEEMod Results

AMPORTS - Sewer Line Installation

Contra Costa County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Industrial	0.75	User Defined Unit	0.75	0.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.2	**Precipitation Freq (Days)**	58
Climate Zone	4			**Operational Year**	2023
Utility Company	Pacific Gas & Electric Company				
CO2 Intensity (lb/MWhr)	641.35	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Sewer Line Installation is .75 acres

Construction Phase - 100 linear feet per day

Off-road Equipment - estimated hours based on 100 linear feet of construction per day

Table Name	Column Name	Default Value	New Value
tblConstructionPhase	NumDays	100.00	20.00
tblConstructionPhase	NumDays	5.00	20.00
tblConstructionPhase	NumDays	2.00	20.00
tblConstructionPhase	PhaseEndDate	6/13/2022	3/2/2022

tblConstructionPhase	PhaseEndDate	6/20/2022	3/30/2022
tblConstructionPhase	PhaseEndDate	1/20/2022	2/2/2022
tblConstructionPhase	PhaseStartDate	1/25/2022	2/3/2022
tblConstructionPhase	PhaseStartDate	6/14/2022	3/3/2022
tblConstructionPhase	PhaseStartDate	1/20/2022	1/6/2022
tblLandUse	LotAcreage	0.00	0.75

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	9.4200e-003	0.0818	0.0965	1.9000e-004	0.0181	3.9100e-003	0.0220	9.0800e-003	3.6200e-003	0.0127	0.0000	16.6792	16.6792	4.5900e-003	0.0000	16.7939
Maximum	**9.4200e-003**	**0.0818**	**0.0965**	**1.9000e-004**	**0.0181**	**3.9100e-003**	**0.0220**	**9.0800e-003**	**3.6200e-003**	**0.0127**	**0.0000**	**16.6792**	**16.6792**	**4.5900e-003**	**0.0000**	**16.7939**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2022	9.4200e-003	0.0818	0.0965	1.9000e-004	0.0181	3.9100e-003	0.0220	9.0800e-003	3.6200e-003	0.0127	0.0000	16.6792	16.6792	4.5900e-003	0.0000	16.7939
Maximum	**9.4200e-003**	**0.0818**	**0.0965**	**1.9000e-004**	**0.0181**	**3.9100e-003**	**0.0220**	**9.0800e-003**	**3.6200e-003**	**0.0127**	**0.0000**	**16.6792**	**16.6792**	**4.5900e-003**	**0.0000**	**16.7939**

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

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Grading	Grading	1/6/2022	2/2/2022	5	20	
2	Trenching	Building Construction	2/3/2022	3/2/2022	5	20	
3	Paving	Paving	3/3/2022	3/30/2022	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Trenching	Tractors/Loaders/Backhoes	2	5.30	97	0.37
Trenching	Excavators	1	2.70	158	0.38
Paving	Plate Compactors	1	2.70	8	0.43
Grading	Graders	1	1.60	187	0.41
Paving	Pavers	1	1.60	130	0.42
Paving	Rollers	2	3.30	80	0.38
Paving	Crushing/Proc. Equipment	1	1.00	85	0.78
Grading	Tractors/Loaders/Backhoes	1	2.70	97	0.37
Trenching	Off-Highway Trucks	1	2.70	402	0.38

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Grading	4	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	0.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Trenching	8	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT
Paving	10	10.00	0.00	0.00	10.80	7.30	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Grading - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0151	0.0000	0.0151	8.2800e-003	0.0000	8.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3900e-003	0.0162	0.0110	2.0000e-005		6.4000e-004	6.4000e-004		5.9000e-004	5.9000e-004	0.0000	2.0858	2.0858	6.7000e-004	0.0000	2.1027
Total	**1.3900e-003**	**0.0162**	**0.0110**	**2.0000e-005**	**0.0151**	**6.4000e-004**	**0.0157**	**8.2800e-003**	**5.9000e-004**	**8.8700e-003**	**0.0000**	**2.0858**	**2.0858**	**6.7000e-004**	**0.0000**	**2.1027**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4800e-003	3.8000e-004	0.0000	3.8000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4800e-003**	**3.8000e-004**	**0.0000**	**3.8000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0151	0.0000	0.0151	8.2800e-003	0.0000	8.2800e-003	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	1.3900e-003	0.0162	0.0110	2.0000e-005		6.4000e-004	6.4000e-004		5.9000e-004	5.9000e-004	0.0000	2.0858	2.0858	6.7000e-004	0.0000	2.1027
Total	**1.3900e-003**	**0.0162**	**0.0110**	**2.0000e-005**	**0.0151**	**6.4000e-004**	**0.0157**	**8.2800e-003**	**5.9000e-004**	**8.8700e-003**	**0.0000**	**2.0858**	**2.0858**	**6.7000e-004**	**0.0000**	**2.1027**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	1.4800e-003	1.0000e-005	1.4800e-003	3.8000e-004	0.0000	3.8000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**1.4800e-003**	**1.0000e-005**	**1.4800e-003**	**3.8000e-004**	**0.0000**	**3.8000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

3.3 Trenching - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	4.6500e-003	0.0418	0.0520	1.0000e-004		1.9800e-003	1.9800e-003		1.8200e-003	1.8200e-003	0.0000	9.0678	9.0678	2.9300e-003	0.0000	9.1411
Total	**4.6500e-003**	**0.0418**	**0.0520**	**1.0000e-004**		**1.9800e-003**	**1.9800e-003**		**1.8200e-003**	**1.8200e-003**	**0.0000**	**9.0678**	**9.0678**	**2.9300e-003**	**0.0000**	**9.1411**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

Mitigated Construction On-Site

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

Category	tons/yr										MT/yr					
Off-Road	4.6500e-003	0.0418	0.0520	1.0000e-004		1.9800e-003	1.9800e-003		1.8200e-003	1.8200e-003	0.0000	9.0678	9.0678	2.9300e-003	0.0000	9.1411
Total	**4.6500e-003**	**0.0418**	**0.0520**	**1.0000e-004**		**1.9800e-003**	**1.9800e-003**		**1.8200e-003**	**1.8200e-003**	**0.0000**	**9.0678**	**9.0678**	**2.9300e-003**	**0.0000**	**9.1411**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

3.4 Paving - 2022

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5200e-003	0.0233	0.0272	4.0000e-005		1.2800e-003	1.2800e-003		1.2000e-003	1.2000e-003	0.0000	3.5869	3.5869	9.4000e-004	0.0000	3.6105
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Total	**2.5200e-003**	**0.0233**	**0.0272**	**4.0000e-005**		**1.2800e-003**	**1.2800e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**3.5869**	**3.5869**	**9.4000e-004**	**0.0000**	**3.6105**

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	2.5200e-003	0.0233	0.0272	4.0000e-005		1.2800e-003	1.2800e-003		1.2000e-003	1.2000e-003	0.0000	3.5869	3.5869	9.4000e-004	0.0000	3.6105
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**2.5200e-003**	**0.0233**	**0.0272**	**4.0000e-005**		**1.2800e-003**	**1.2800e-003**		**1.2000e-003**	**1.2000e-003**	**0.0000**	**3.5869**	**3.5869**	**9.4000e-004**	**0.0000**	**3.6105**

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.9000e-004	1.9000e-004	2.1000e-003	1.0000e-005	7.9000e-004	1.0000e-005	8.0000e-004	2.1000e-004	0.0000	2.2000e-004	0.0000	0.6462	0.6462	1.0000e-005	0.0000	0.6466
Total	**2.9000e-004**	**1.9000e-004**	**2.1000e-003**	**1.0000e-005**	**7.9000e-004**	**1.0000e-005**	**8.0000e-004**	**2.1000e-004**	**0.0000**	**2.2000e-004**	**0.0000**	**0.6462**	**0.6462**	**1.0000e-005**	**0.0000**	**0.6466**