Appendix B1
Air Emissions

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1.0 Emissions Methodology – Models and Tools

This Draft SEIR represents an analysis of the emissions from continued operation of the CS Terminal Berths 97-109 using the latest tools and models available. The 2008 EIS/EIR emissions analysis utilized tools and models, activity data and forecasts of throughput and activity, that are now considered out of date and cannot be replicated, as described further below. Therefore the baseline for this SEIR for air quality cannot use the direct quantitative results of the 2008 EIS/EIR as these can no longer be replicated.

The AQ/HRA analysis relies on three primary steps: (1) the development of emissions from all source categories; and (2) the use of those emissions as inputs to dispersion modeling to predict pollutant concentrations; and (3) the use of the predicted pollutant concentrations to estimate health risk impacts. Since the analysis conducted as part of the 2008 EIR/EIS, substantial revisions have been made to all of the tools used in the three steps described above for AQ analysis. These revisions are substantial enough that it is not possible to recreate the results of the 2008 EIR/EIS analysis.

1) Emissions analysis relies on a variety of models that are used to estimate emissions from specific source categories. For all on-road vehicles (diesel and gasoline), the current CARB release of the EMFAC model is EMFAC2014. This EPA-approved model replaces EMFAC2011, and the previous EMFAC2007 which was used in the 2008 EIR/EIS. As the latest version of the model, EMFAC2014 represents CARB's current understanding of motor vehicle travel activities and their associated emission levels (CARB, 2017a). As part of CARB's Technical Documentation for the EMFAC2014 model, CARB has identified the following overview of major changes to the EMFAC model with release of EMFAC2014 (CARB, 2015):

    - Updated DMV data on vehicle populations;
    - New socio-econometric forecasting methods for determining vehicle replacement rate and VMT growth trends;
    - New emission factors based upon new vehicle testing data – in particular for heavy heavy-duty diesel trucks for which diesel particular filters were found to be more effective than anticipated in EMFAC2011 at all operation conditions leading to lower PM emissions in EMFAC2014 than in EMFAC2011; and new testing data indicating that at lower speeds selective catalytic reduction is less effective at reducing NOx leading to higher NOx emissions at lower speeds;

    In addition to the EMFAC2014 model, CARB has released specific inventory tools for several source categories that were not available at the time of the 2008 EIR/EIS. These include the 2011 Cargo-Handling Equipment Inventory Model (CARB, 2017b), and the VISION model for locomotive emissions scenarios (CARB, 2017c). The 2011 CHE Inventory model replaced the use of CARB's OFFROAD2007 to estimate emissions from CHE (CARB, 2017a). Major updates included in the 2011 CHE Inventory Model include:

- Updated population and activity data – based on Port of Los Angeles and Long Beach inventories, major rail yard inventories, other port inventories and regulatory reporting data;
- Impact of the 2008-2009 recession on growth rates of equipment populations;
- Engine load factors;

The VISION model version 2.1 module for locomotives was released in June 2016 (CARB, 2017c). VISION v2.1 was designed to support CARB's 2016 Mobile Source Strategy and incorporates the latest planning inventory and assessments. Prior to the VISION v2.1 release, no specific guidance was available from CARB or other agencies on forecasting locomotive emissions to future years of analysis in CEQA documents. VISION v2.1 includes the following updates for locomotive emissions:

- Updated Tier 4+ emission factors for PM and NOx;
- Updated Tier distribution for all Tiers to match the proposed measures in the Mobile Source Strategy;

Collectively these updates to the emissions models represent a substantial change in the quantitative prediction and forecasting of emissions from a project-level analysis.

2) Dispersion modeling analysis primarily uses the EPA's AERMOD modeling system (EPA, 2017). The AERMOD modeling system was used in the dispersion modeling conducted for the 2008 EIR/EIS, however the model has undergone many changes since then. The EPA has released a total of 12 Model Change Bulletins since 2006, indicating major and minor changes to the model code. A partial list of the changes included in the Model Change Bulletins is provided below:

   - Bug fixes for a wide variety of bugs reported in previous model versions (throughout all Model Change Bulletins);
   - New options to vary emissions by month, hour-of-day and day-of-week;
   - New urban options to allow multiple urban areas to be defined in a single run;
   - New option to specify initial in-stack NO2 ratio for PVMR and OLM options;
   - New option to allow for both flat and elevated terrain treatments within the same model run;
   - Incorporation of user-specified dry deposition velocities for gaseous emissions;
   - Incorporation of new algorithms to support estimation of concentrations in the form of the 1-hour NO2 and SO2 NAAQS and the 24-hour PM2.5 standard (based on a ranked percentile value averaged over the number of years processed);

- New option to add user-specified background concentrations to modeled concentrations to determine cumulative impacts;
- Incorporated the equilibrium NO2/NOx ratio component of the PVMRM option into the OLM option for estimating conversion from NOx emissions to ambient NO2 concentrations;
- Modification to the urban option has been implemented to address issues with the transition from the nighttime urban boundary layer to the daytime convective boundary layer;
- New option to allow the user to specify the number of years of meteorological data that are being processed for a particular run;
- Introduction of two new options to address concerns regarding model performance under low wind speed conditions;
- Introduction of a line-source type;
- New option to model NO2 using the Ambient Ratio Method (ARM);
- New option to vary background ozone and background modeled pollutant concentrations by wind sector;

This list represents just a partial sample of the enhancements, bug fixes and other miscellaneous changes that EPA has made to the AERMOD model since 2008. It would not be expected that results from running the 2006 or 2007 version of the model could be duplicated running the 2016 (latest) version of the model given the number and extent of changes that have been made.

3) In response to concerns regarding children's health and to address the specific mandates of SB-25, OEHHA worked in conjunction with the Air Resource Board (ARB) to revise the previous set of Technical Support Documents (TSD) (OEHHA 2008, 2009 and 2012) to incorporate scientific information and approaches developed since the previous guidelines were prepared. These TSDs delineated OEHHA's revised methodologies for deriving reference exposure levels (RELs), deriving, listing and adjusting cancer potency factors, and applying updated exposure assumptions and risk assessment methodologies including stochastic risk assessment based on current science. To date, these TSDs have undergone public and peer review, and were approved by the State's Scientific Review Panel on Toxic Air Contaminants, and adopted by OEHHA for use in the Air Toxics Hot Spots program. OEHHA released the final Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments in February 2015 (OEHHA, 2015), which combines the critical information from the three TSDs into a guidance manual for the preparation of HRAs. The Guidance Manual has been reviewed by public and SRP. This guidance supersedes the 2003 Guidance Manual (OEHHA 2003) and is the final integrated document of the series that incorporates, clarifies, and finalizes methodologies contained in the three previously-released supporting TSDs to support the continued conduct of risk assessment under the Air Toxics Hot Spots Program (AB2588). The major changes proposed in the Guidance Manual for risk evaluation include the incorporation of age-sensitive factors (ASFs) in the cancer risk evaluation, age-specific exposure variates (e.g. breathing rates and soil ingestion rates), reduced exposure durations for individual resident and worker, incorporation of "fraction of time at home" (FAH) in residential risk

evaluations, revised methodology for the dermal pathway evaluation, additional multi-pathway chemicals, mandatory requirement on population risk evaluation, multi-pathway risk evaluation and repeated 8- hour evaluation (where applicable), and recommendations on how to evaluate short-term construction projects. Analysis of the most recent OEHHA Hot Spots Guidance (2015) indicates that OEHHA's proposed risk assessment methodologies may lead to a lifetime residential risk estimate from inhalation exposure roughly 3 times higher, relative to the risk results calculated from methodologies recommended in the 2003 Hot Spots Guidance Manual. On the other hand, the risk estimate based on the 2015 OEHHA recommended risk assessment methodologies is slightly lower for the long-term worker. The impacts from construction projects which have shorter exposure duration are expected to be much higher on residents and slightly higher on workers based on the 2015 OEHHA methodologies.

2.0 Emissions Methodology – Scenarios

The Draft SEIR air quality analysis studies two 2014 baselines and two future scenarios each including four future years: 2023, 2030, 2036, and 2045. The methodology for calculating emissions for the various operational sources at China Shipping terminal is discussed below. The scenarios are as follows:

1) 2014 Unmitigated Baseline – this scenario refers to activity levels, equipment and throughput as they occurred in the year 2014 including those mitigation measures required by the 2008 EIS/EIR that have already been implemented;

2) 2014 Mitigated Baseline – this scenario refers to activity levels and throughput as they occurred in the year 2014, modified to show application of all mitigation measures required at the time by the 2008 EIS/EIR (i.e. both those mitigation measures that have already been implemented and those that have not been implemented). This scenario may also be referred to as "FEIR Mitigated Baseline";

3) Revised Project – this scenario refers to projected future years of 2023, 2030, 2036 and 2045 activity levels and emissions, accounting for mitigation measures that have already been implemented, future regulations that affect various emission sources, and the modified mitigation measures as described in Chapter 2. This scenario may also be referred to as "Proposed Mitigated" as it pertains to the modifications to mitigations in the SEIR;

4) FEIR Mitigated Scenario – this scenario refers to projected future years of 2023, 2030, 2036 and 2045 activity levels and emissions which account for all mitigation measures required in the 2008 EIS/EIR and all future regulations that affect emissions sources; this scenario is presented for informational purposes only;

In addition, as described in Appendix B3, variations of the Unmitigated and Mitigated Baselines were developed for purposes of the health risk assessment (HRA), since the health risk assessment requires various specific averaging periods for emissions.

3.0 Methodology for Determining Operational Emissions

Operational emission sources are represented by five major sources: (1) container ships (referred to as Ocean Going Vessels, or OGVs); (2) tugboats (also referred to as harbor craft); (3) drayage trucks; (4) line-haul and switcher locomotives; and (5) cargo handling equipment (CHE) working or servicing the China Shipping (CS) terminal. These sources generate emissions in the form of CO, VOC, NOX, SOX, PM10, PM2.5, and diesel PM (DPM); the latter is produced by diesel-fueled sources. In addition, minor sources such as worker commute vehicles, are included. When ships are using shore power or AMP, indirect emissions would be created by regional power plants burning fossil fuels to generate the electricity consumed by the hoteling ships; electricity consumption emissions are also estimated for on-site power demand such as lighting and buildings. Electricity consumption emissions are evaluated for greenhouse gases only. Finally, on-road sources like trucks and commuter vehicles contribute to estimated paved road dust emissions.

Information regarding the activity and characteristics of proposed operational emission sources was obtained primarily from POLA staff, WBCT staff, a traffic study conducted as part of this SEIR, and the annual published 2013-2014 Port of Los Angeles Emissions Inventories (LAHD 2014-2015). Activity and utilization assumptions used to estimate peak daily operational emissions for comparison to SCAQMD emission thresholds represent upper-bound estimates of activity levels at the terminal; these levels would occur infrequently, and, therefore, represent a conservative set of assumptions.

Table B1-A summarizes the regulations assumed in the future operational emissions calculations for all scenarios. Current in-place regulations are treated as default project elements rather than mitigation because they represent enforceable rules, with or without proposed project approval. Measures developed as part of the SEIR analysis and planned for future implementation at the Project level were treated as mitigation.

Table B1-A: Regulations and Agreements Assumed as Part of the Unmitigated Operational Emissions

Container Ships	Tugboats	Terminal Equipment	Trucks	Trains
MARPOL Annex VI: 0.1% sulfur limit for fuels, beginning in 2015 (200 nm of CA coast). NO_X engine emission limits for new engines.[a] **EPA Engine Standards for Marine Diesel Engines:** NO_X, HC, and CO engine	**EPA Engine Standards for Marine Diesel Engines:** NO_X, HC, and CO engine emission standards for new engines. **CARB Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft:** Requires that harbor	**EPA Emission Standards for Non-road Diesel Engines:** Engine standards for newly built engines. **CARB Mobile CHE at Ports and Intermodal Rail Yards:** Emission performance standards on new and in-use terminal	**EPA Emission Standards for On-road Trucks:** Tiered standards gradually phased in over all years due to normal truck fleet turnover. **California Diesel Fuel Regulation:** 15-ppm sulfur. **Heavy Duty Diesel Vehicle Idling Emission Reduction**	**EPA Emission Standards for Locomotives:** Tier 0 through Tier 4 standards gradually phased in over all years due to normal locomotive fleet turnover. **CARB 1998 South Coast Locomotive Emissions Agreement:** Cleaner

Container Ships	Tugboats	Terminal Equipment	Trucks	Trains
emission standards for new engines.[b] **CARB Airborne Toxic Control Measure for Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels Within California Waters and 24 Nautical Miles of the California Coast:** Limits sulfur content for marine gas oil or marine diesel oil to 0.1% sulfur by January 2014. **CARB Regulation to Reduce Emissions from OGV Auxiliary Engines at Berth:** Operational limits for OGV auxiliary engines while at hoteling at berth: 50% in 2014, 70% in 2017, and 80% in 2020. **CAAP Vessel Speed Reduction Program:** 95% compliance to 20 nm.	craft engines meet EPA's most stringent emission standards per an accelerated, rule-specified compliance schedule. **California Diesel Fuel Regulation:** 15 ppm sulfur.	equipment**. California Diesel Fuel Regulation:** 15-ppm sulfur.	**Regulation:** Idling limits for on-terminal trucks. **CARB On-Road Heavy-Duty Diesel Vehicles (In-Use) Regulation:** Trucks are required to replace engines with 2010+ engines by January 2023. Trucks with GVWR greater than 26,000 must also meet PM BACT. **CAAP Clean Truck Program:** In January 2012, banned all trucks that did not meet 2007+ EPA standards for heavy duty trucks.	NO_X Class I locomotives. **CAAP PHL Rail Switch Engine Modernization:** All PHL locomotives meet Tier 3 or 4 standards. **CARB Non-road Diesel Fuel Rule:** 15-ppm sulfur starting January 1, 2012. Applies to all line-haul locomotives. **California Diesel Fuel Regulation:** 15-ppm sulfur. Applies to all switch locomotives.

Note:
This table is not a comprehensive list of all applicable regulations; rather, the table lists key regulations and agreements that substantially affect the emission calculations for the years analyzed. A description of each regulation or agreement is provided in Section 3.2.3.

[a] 100% compliance with IMO Annex VI sulfur limits in SO_X Emission Control Areas is assumed and analyzed.
[b] Compliance with EPA engine standards is assumed but not analyzed for every pollutant other than NOx. This is because emissions factors for marine vessels currently available in the literature only provide quantifiable effects of engine Tier levels for NOx emissions.

Emissions for every pollutant by source category, by analysis year, by averaging period (annual, 24hr. 1hr, 8hr) and for every scenario studied in this SEIR are summarized in Tables B1-490 through 505 of Appendix B1.

3.1 Container Ships

Emissions of ocean going vessels were calculated for each engine type (boiler, main propulsion engine, and auxiliary engine) and by activity and location where emissions take place. Emissions were calculated during transit, hoteling at berth, and anchorage of

container vessels. Activity assumptions for the Unmitigated and Mitigated Baselines were based on actual vessel call records for vessels visiting China Shipping terminal in 2014. Records provide vessel characteristics, including TEU category of vessels, main engine horsepower, engine tier levels, etc. For future years, vessel call activity was developed by the Port using the BERTHA model, which simulated the number of calls and TEU category of vessels annually calling in future years at China Shipping, as well as peak day scenarios for vessel activity. The assumptions below were applied to estimate unmitigated OGV emissions.

3.1.1 Emission Factor Assumptions:

- Emission factors for propulsion engines, auxiliary engines, and auxiliary boilers were obtained from the 2014 Port Emissions Inventory (LAHD 2015). The 2014 Port Emissions Inventory provided emission factors for ship TEU categories reflected in the 2014 operations and future year operations. These are shown in Table B1-60.
- Based on the POLA inventory, it was assumed that diesel propulsion engines were low-speed and auxiliary engines were medium-speed.
- Emission factors for propulsion and auxiliary engines are dependent upon engine tier, which in turn is dependent upon engine age. For 2014 calculations, the mix of vessels by age, i.e., vessel fleet mix, for each ship TEU category was determined from keel dates in vessel call data records for China Shipping terminal in 2014. Emissions factors by tier were combined into fleet-wide average based on the baseline fleet mix for each ship TEU category.
- The mix of older and newer ships calling at CS in future years was predicted using POLA CEQA Terminal Level Container Ship Forecast for Tier 3 Engines (POLA 2015). A fleet mix baseline was established for OGVs calling in the future:
    - Vessels of size bins calling in the future which also appeared in 2014 (e.g. 8000 TEU and 9000 TEU) were assumed to be the same vessels calling in the baseline, thus predicting their age in future years by the POLA forecasting method.
    - Vessels size bins not originally present in 2014 but now showing in future were assumed to be the same age during 2014 as the closest-size vessel of the same capacity group from 2014
- In 2014 calculations, emission factors were adjusted for the appropriate sulfur fuel content determined by vessel call records. In future year calculations, 0.1% fuel sulfur content was assumed for peak day and annual ship calls per CARB's *ATCM for Fuel Sulfur and Other Operational Requirements for Ocean-Going Vessels within California Waters and 24 Nautical Miles of the California Baseline* and MARPOL Annex VI (CARB 2011).
- Correction factors by percentile load of propulsion were applied to the Main Engine emission factors to account for low loads and different engine manufacturing brand, i.e., MAN B&W versus Non-MAN B&W engines. MAN B&W engines consider the effects of slide valves on emissions. These correction

factors are summarized in tables B1-64 to B1-67 and were obtained from the POLA 2014 Emissions Inventory.

Table B1-B. Assumptions about Slide Valves and MAN/Non-MAN engines based on ship TEU category

TEU Category	Main Engine Type	Assumption
5,000-6,000	MAN	Cross-referenced with IHS Ship Registry and historical CS call data. 16/18 vessels have MAN engines.
7,000-8,000	Non-MAN	No historical call data for this capacity. Non-MAN is a conservative assumption.
8,000-9,000	MAN	Same as 2014
9,000-10,0000	Non-MAN	Same as 2014
12,0000-13,000	Non-MAN	Assumed that engines are non-MAN
TEU Category	Has slide valve?	Assumption
5,000-6,000	Yes	Based on keel laid year from historical call data. All newer ships have slide valves.
7,000-8,000	Yes	Assuming that newer ships have slide valves.
8,000-9,000	Yes	Same as 2014
9,000-10,0000	No	Same as 2014
12,0000-13,000	Yes	Assuming that newer ships have slide valves.

3.1.2 Engine and Boiler Load Assumptions:

- For the 2014 calculations, auxiliary engine and boiler loads by TEU ship category were obtained from the 2014 Port Inventory (LAHD 2015). Loads for transit, hoteling, and anchorage were provided by Starcrest.
- During transit, main engine load factors were determined using the propeller law, which states that the engine load factor is proportional to the speed of the ship cubed. For the 2014 calculations, speeds by transit zone were obtained from 2014 call records. For future years, the BERTHA model provided estimated transit speed by zone, including percentage.
- For vessel TEU categories projected to call in future years that also called in 2014 (8k, 9k), the same loads as in 2014 were assumed for each engine type, by zone.

- For vessels sizes that did not call during 2014, but were projected to call in the future, loads were assumed as follows:
  - Main Engines: 12k TEU vessel loads were projected with the same increment between 2014 load values of the 8k TEU vessel and the 10k TEU vessels. 5k and 7k TEU vessel loads averaged between 2014 load values of 4k-6k and 6k-8k vessels, respectively.
  - Auxiliary and Boiler: 5k and 7k TEU vessels loads were based on the 2014 POLA inventory default average loads by zone (Tables 3.4 and 3.6). 12k TEU vessel loads assumed the same as 13k TEU vessel loads shown in the 2014 POLA inventory (Tables 3.4 and 3.6).

3.1.3 VSRP Assumptions:

- Vessel speed reduction program (VSRP) compliance in the Unmitigated Baseline was determined from actual 2014 vessel call records. This is summarized in Table B1-70.
- Annual VSRP compliance between the precautionary zone and 20 nm (zone 4) and 20 nm and 40 nm (zone 5) in all future analysis years was assumed to be 82% without mitigation per Bertha model, based on the 2014 compliance rate.
- Per Bertha model, during future year peak days, all vessels are traveling through the fairway under VSR compliant speed.

3.1.4 Hoteling Assumptions:

- During hoteling (without AMP), ships were assumed to turn off main engines but leave the auxiliary engines and boilers running.
- Hoteling times used in annual calculations during 2014 were obtained from the 2014 POLA inventory. The average hoteling time for baseline vessels is summarized in Table B1-69.
- The average hoteling time per call for future analysis years was determined by BERTHA model and was based on anticipated shipping schedules, future projected lifts per call, ship work rates, and crane productivity. This is summarized in Table B1-83 and B1-99.
- Peak day hoteling times were determined by BERTHA model for each analysis year and ship category, and were based on anticipated shipping schedules, future projected lifts per call, ship work rates, and crane productivity.

3.1.5 AMP Assumptions:

- With AMP, the auxiliary engines would be turned off, but boilers would continue to operate. However, it is assumed that vessels connecting to AMP would require time with auxiliary engines running to engage and disengage from AMP (CARB 2007). Connection time for AMP plug-in is based on 2014 vessel call data provided by POLA. The connectivity time is summarized in Tables B1-69, Table B1-83 and B1-99 for baseline and future years of FEIR Mitigated and Revised Project scenarios, respectively.

- In future analysis years, annual AMP utilization was assumed to meet the maximum regulatory requirements per CARB's Regulation to Reduce Emissions from OGV Auxiliary Engines at Berth (CARB 2007). Hence, an AMP compliance rate of 80% for annual calls was assumed for analysis years 2023-2045.
- Peak day AMP utilization was assumed zero for the unmitigated scenario as a conservative assumption.

3.1.6 Additional Assumptions:

- Ship transit emissions were calculated from berth to the edge of the SCAB over-water boundary (roughly a 50-mile one-way trip).
- 2014 peak day emissions are derived from analyzing emissions from days of highest 24hr consecutive activity within harbor in 2014 vessel call records, and selecting the 24hr period with highest in-harbor emissions. In-harbor activity consists of hoteling at berth, maneuvering within harbor, and anchorage.
- Once the peak day is selected the 8hr period within the peak day with the highest in-harbor NO and PM emissions is selected as the peak 8hr period. Similarly the highest 1hr of NOx and PM emissions within harbor is selected as the 1hr peak period.
- Future year project peak day emissions profiles are from BERTHA model. Two sets of data were analyzed: one for 2023 and another for at capacity years - 2030, 2036 and 2045. This typically included three vessels, two at berth and one anchoring.
- Some arriving container ships are unable to proceed directly to the berth, but instead must wait at a designated anchorage point either inside or outside the breakwater until given clearance to proceed to the berth. Average anchorage frequency and duration for each container ship size were obtained from the 2014 POLA inventory, based on 2014 data for China Shipping ship visits. Similar to hoteling, the main engine is assumed to be turned off during anchorage, while the auxiliary engines and boilers are assumed to remain running.
- For future years, anchorage frequency for annual calls was assumed to be nearly 8%, based on average of historical data on anchorage frequency for CS terminal. Anchorage duration for any particular anchorage episode was assumed to last 7.39 hours, derived from average across anchorage durations of events recorded in historical data for CS terminal.
- For future year peak days, one instance of anchorage and one of transit to anchorage were added for vessel calls predicted in the peak day scenario from the BERTHA model. Historical averages of anchorage duration were assumed for peak day event.

  China Shipping SEIR analyzes two different mitigated scenarios, which affect OGV emissions, 1) what-if scenarios where baseline and future years 2023-2045 are subject to 2008 FEIR/EIS mitigations, i.e. FEIR Mitigated, 2) scenario where future years 2023-2045 are subject to Proposed Mitigations in SEIR, i.e. Revised Project.

The following revisions to OGV assumptions were made to reflect the Revised Project mitigations and the FEIR Mitigated Scenario.

- FEIR Mitigated Scenario:
  - 100% of vessel calls use AMP when hoteling at berth;
  - 100% of vessel calls comply with VSRP.
- Revised Project Scenario:
  - 95% of vessel calls use AMP when hoteling at berth;
  - 95% of vessels calls comply with VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area.

3.2 Tugboats (Harbor Craft)

During operations, tugboats are used to assist container ships while maneuvering and docking inside the Port breakwater. The assumptions below were applied to estimate peak day and annual emissions. Harbor craft emissions are not subject to mitigations in any scenario and thus there is no variation between the Revised Project and the FEIR Mitigated Scenarios. Activity and emissions for tugboats are summarized in Table B1-404 to 489 in Appendix B1.

- Two tugboats were assumed for each arrival/departure assist of a container ship.
- Tugboat transit time was assumed to equal the average of container ship transit times in the harbor, multiplied by 1.3 to account for tug movement to and from base (LAHD 2014).
- Tugboat main and auxiliary engine sizes and load factors were obtained from the 2014 Port Emissions Inventory (LAHD 2015).
- Tugboat emission factors were derived based on EPA standards for marine compression-ignition engines. The applicable engine Tiers were determined based on EPA requirements for new engines, average age, and size of tugboats operating in the Port, as well as the CARB harbor craft compliance schedule (CARB 2009)
- For the baseline, average engine model year of harbor craft fleet was obtained from the 2014 Port Inventory (LAHD 2015).
- The turnover rate of the average engine was determined according to the CARB harbor craft compliance schedule and consequently was applied to zero hour emission factors by model year and deterioration rates from CARB Harbor Craft Database to obtain composite emission rates for every future year analyzed.
- The fuel sulfur content was assumed to be 15 ppm for all analysis years, in accordance with California Diesel Fuel Regulation (CARB 2005).
- Peak activity for daily, hourly, and 8hr periods are based on vessel maneuvering transit durations for peak periods.

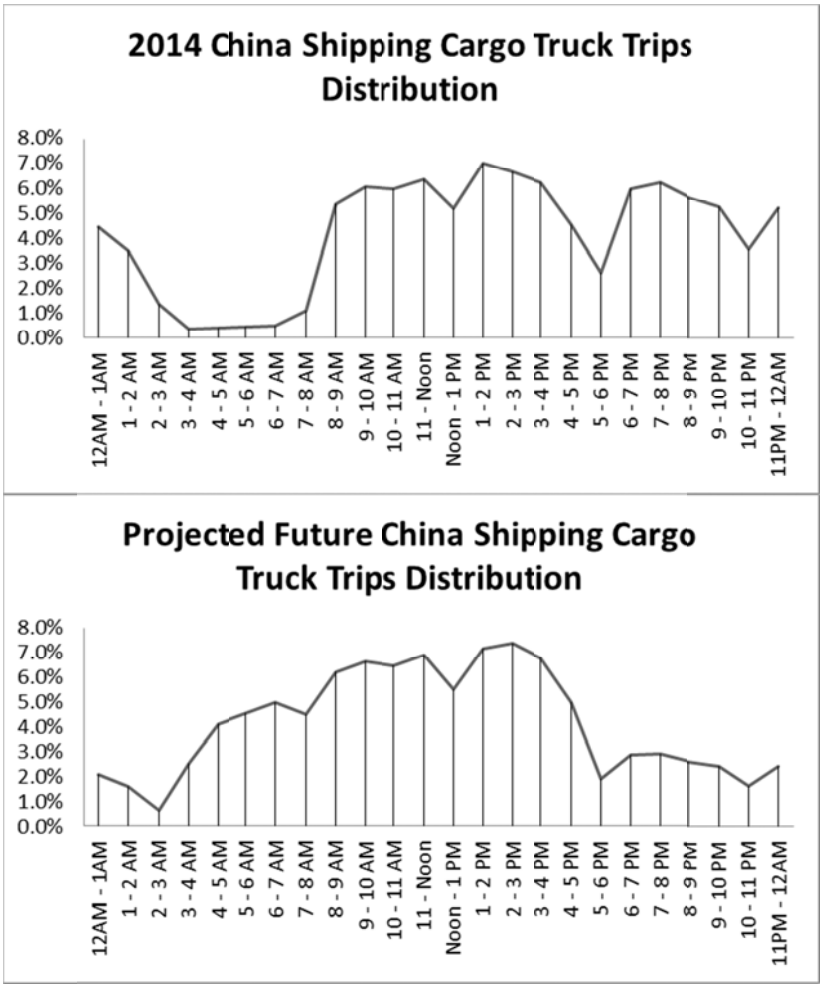
3.3 Drayage Trucks

The assumptions below were applied to estimate peak day and annual emissions for drayage trucks handling cargo for the China Shipping terminal. Drayage trucks are heavy duty diesel-fueled trucks, although a small percentage of the fleet servicing POLA terminals are LNG-fueled. Emissions produced by drayage trucks are derived from their activity while driving inside the terminal (on-site), while short-term idling at gate and inside the terminal, and while driving off-site to carry cargo to off-site railyards or other destinations.

- Emissions from on-road, heavy-duty diesel trucks were calculated using emission factors generated by the EMFAC2014 on-road mobile source emission factor model (CARB 2015a). Emission factors by model year were aggregated into composite fleet-wide emission factors using the Port drayage truck fleet mix for the baseline. The predicted future mix was obtained from the Port's future year emissions inventories (POLA, 2016).
- The Port's truck fleet mix reflects the Clean Truck Program, which banned pre-1989 trucks from Port services in October 2008 and all trucks that did not meet 2007 and newer on-road heavy duty truck standards by January 1, 2012. The baseline fleet mix is presented in Table B1-253 of Appendix B1.
- Trucks fueled with liquefied natural gas (LNG) composed 8.2% of the POLA truck calls in the 2014 baseline year (LAHD 2015). Although the percentage of alternative-fueled drayage trucks is likely to increase in future years, the fleet was conservatively assumed to remain 8.2% LNG trucks for the Revised Project scenario (as described further below). LNG trucks are subject to the same emission standards as diesel trucks, and therefore were assumed to have the same criteria pollutant emission factors as diesel trucks. However, DPM emissions were assumed to be 5% of total PM_{10} exhaust emissions from LNG trucks to account for dual-fueled diesel/LNG trucks in the fleet.
- PM_{10} and $PM_{2.5}$ emissions from paved road dust were calculated separately and added to the EMFAC2014 emissions from truck exhaust, tire wear, and brake wear. Road dust emission factors for on-terminal driving, off-terminal local streets, and freeways followed CARB's methodology to estimate entrained road dust emission factors, using the equations in EPA's Compilation of Air Pollutant Emission Factors AP-42 (USEPA 2011) and CARB silt loading values for California roadways in its April 2014 guidance document for estimating entrained road dust emissions from paved roads (CARB 2014).
- On-site activity including idling times and on-site driving distance was obtained from the 2014 Port Inventory (LAHD 2015).
- Off-site driving activity in the form of traffic flows and miles traveled by link for China Shipping servicing trucks were obtained through traffic modeling as part of the transportation modeling study. Daily and annual truck flows in every link were derived from transportation modeling, and emissions were estimated by-link for dispersion and health risk modeling. Sum of emissions from all links composing the off-site traffic network are summarized as "off-site truck" emissions in Appendix B1, Tables B1-509 to 524.

- Peaking factor from transportation modeling analysis of drayage trucks and gate movements determined the peak daily period for drayage trucks. A 24hr profile of activity derived from transportation modeling for drayage trucks was also used to determine 8hr and 1hr peaks by selecting the consecutive 8hr and 1hr periods with highest truck trips at the terminal. Two versions of the hourly profile were available from transportation modeling, one for the baseline analysis and one for future scenarios. These are shown in Figure B1-A below.

Figure B1-A. China Shipping Truck Trips Time-of-Day Distribution for Baseline and Future.



The following revisions to truck assumptions were made to reflect the Revised Project mitigations and the FEIR Mitigated Scenario.

- FEIR Mitigated scenario includes a mitigation for drayage trucks from the 2008 EIR/EIS document which expected that trucks entering the Berth 97-109 Terminal would be LNG fueled in the following percentages:
  - 50 percent in 2012 and 2013

- 70 percent in 2014 through 2017
- 100 percent in 2018 and thereafter

- The FEIR Mitigated scenarios and baseline assumes the amount of truck trips and off-site VMT travel as a would-be unmitigated scenario with the variation of the percentage of LNG trucks in the fleet to represent the mitigation measure from the previous CS 2008 EIR/EIS. Specifically, DPM emissions would be lower as a result of a larger LNG fleet percentage, given that only 5% of PM_{10} exhaust emissions from LNG trucks is considered DPM, to account for dual-fueled diesel/LNG trucks in the fleet.

  The Revised Project Scenario does not include any quantified mitigation for drayage trucks emissions.

3.4 Cargo Handling Equipment (CHE)

CHE includes yard tractors, RTG cranes, top handlers, forklifts, off-road fueling trucks and other miscellaneous equipment. The marine terminal wharf cranes used to lift containers on and off container ships are electric and, therefore, would have no direct criteria pollutant or TACs emissions (although their electricity consumption is included in electricity generation GHG emissions). CHE equipment list corresponds to entire CHE fleet at WBCT since the CHE equipment at WBCT is shared between Yang Ming and China Shipping terminals. Therefore, for purposes of the analysis the hours of usage of each equipment unit are partitioned based on terminal throughput. The following assumptions were applied to estimate peak day and annual unmitigated emissions:

3.4.1 Equipment and Activity Assumptions:

- 2014 baseline activity consisting of equipment inventory, specifications and annual hours of operation by piece for entire WBCT were provided by Starcrest from the 2014 Port Inventory (LAHD 2015). Baseline actual equipment inventory is summarized in Table B1-31 in appendix B1.
- Future year equipment list is based on 2016 cargo handling equipment inventory provided by WBCT. This is to account for pieces scrapped and replaced between the baseline and the time this study was prepared.
- CHE hours of operation in future analysis years were scaled using on projected terminal throughput changes in every future analysis year and baseline hours-per-TEU ratios.
- CHE model year and load factors for the baseline were obtained from the Port 2014 Inventory (LADH 2015). Baseline load factors were assumed constant in future years analyzed.
- Emission controls in baseline equipment were obtained from the Port 2014 Inventory (LADH 2015)
- Peaking factor from traffic modeling analysis of trucks and gate movements was used to derive peak daily activity for CHE under the assumption that both CHE and drayage trucks peak activity periods are concurrent. The 24hr profiles of activity for drayage trucks was also used to determine 8hr and 1hr peaks the same

way it was done for drayage trucks by selecting highest consecutive peak periods of 8hr and maximum 1hr peak.

3.4.2 Emission Factors Assumptions:

- Emission factors used to estimate emissions for CHE equipment are selected based on the equipment description, horsepower range, model year and age of equipment at analyzed year and fuel type. CHE is grouped in these characteristics or bins, and thus emission rates are found for each bin combination. Emission factors for the baseline are found in appendix B1 in Table B1-32 and similar tables throughout CHE section for every year/scenario combination.
- Emission factors were calculated for every analysis year and scenario conditions for the CHE fleet characteristics in terms of model years (MY) and fuel type/technology. Every equipment piece that is subject to CARB's CHE Regulations is turned over based on ARB compliance schedule requirements for CHE (CARB, 2012). Any further mitigation is applied on top of or replacing CHE rule requirements when more stringent.
- Emission factors were derived from CARB's CHE inventory model, i.e. CHEI (CARB 2015b) and used for diesel equipment. Because CHEI model only provides rates for VOC, CO, NOX, PM10, and PM25; ARB's Offroad2007 model was used to complement emission factors for other pollutants and greenhouse gases.
- Calendar year 2045 is not available in Offroad2007 so the emission rates from CY2040 were used, which is the latest year available
- For LPG-fueled equipment, zero hour and deterioration rate emission factors were obtained from CARB.
- For electric CHE equipment, on-site exhaust emissions were assumed zero emissions for all pollutants. Diesel-hybrid equipment was assumed to use same emission factors as diesel equipment, but engine horsepower was typically much smaller, thus producing lower emissions than a comparable diesel unit.
- Emission factors for LNG-fueled yard tractors are assumed to be the same as diesel equivalent equipment of the same Tier but with zero DPM emissions. Diesel emission rates were used as surrogate since no LNG-specific emission rates for CHE were available.
- The fuel sulfur content was assumed to be 15 ppm for all analysis years, in accordance with California Diesel Fuel Regulation (CARB 2005).

The following revisions to CHE assumptions were made to reflect the Revised Project mitigations and the FEIR Mitigated Scenario.

- FEIR Mitigated scenario assumes the growth in hours of operation and equipment list following the annual throughput forecast for the terminal but equipment characteristics such as model year and fuel type, and therefore, emission rates are updated based on mitigation measures from the previous CS 2008 EIR/EIS. Specifically,

- RTG cranes are electric by 2014, that is they are assumed to produce zero emissions on-site
- All forklifts in baseline must be MY2014 diesel to meet latest tier emission levels Tier 4
- All top handlers with the exception of those that are model years 2011 and newer already during baseline, must be turned over to MY 2014 diesel (Tier 4)
- All LPG yard tractors in baseline must turn over to MY2014 by January 1st, 2015 and would be LNG-fueled (same emission factors used as for Diesel Tier 4 except DPM set to zero)
- CHE characteristics analyzed in future years are based on life-usage turnover schedule of the fleet from the FEIR mitigated baseline.

- Revised Project Scenario assumes the growth in hours of operation and equipment list following the annual throughput forecast for the terminal but includes effects of Revised Project mitigations from current SEIR. Specifically following the replacement schedule shown below.

Table B1-C: Proposed Mitigation Replacement Schedule for CHE

Equipment Inventory in 2016	HP	Fuel Type	Model Year	Quantity (WBCT)	Proposed Mitigation Replacement	Replacement Scheduled for
Forklift up to 18 tons	137	Diesel	2007	1	Tier 4 diesel, or potentially any alternative fuel meeting Tier 4	2021
Forklift up to 18 tons	152	Diesel	2004	2	Tier 4 diesel, or potentially any alternative fuel meeting Tier 4	2019
Forklift up to 18 tons	152	Diesel	2005	2	Tier 4 diesel, or potentially any alternative fuel meeting Tier 4	2020
Forklift up to 5 tons	75	LPG	2011	1	Upgrade to electric	2020
Forklift up to 5 tons	160	LPG	2005	2	Upgrade to electric	2020
Forklift up to 5 tons	160	LPG	2008	2	Upgrade to electric	2020
Forklift up to 5 tons	165	LPG	2002	2	Upgrade to electric	2020
Rub-trd Gantry Crane	454	Diesel	2004	2	Tier 4 hybrid	2023
Rub-trd Gantry Crane	612	Diesel	2003	8	Tier 4 hybrid	2021
Rub-trd Gantry Crane	685	Diesel	2005	5	Upgrade 4 electric, 1 Tier 4 hybrid	2019
Rub-trd Gantry Crane	197	Eco Crane	2005	1	Hybrid equipment does not require additional mitigation, assumed to turn over	na

Equipment Inventory in 2016	HP	Fuel Type	Model Year	Quantity (WBCT)	Proposed Mitigation Replacement	Replacement Scheduled for
					by end of life	
Rub-trd Gantry Crane	197	Hybrid	2015	5	Hybrid equipment does not require additional mitigation, assumed to turn over by end of life	na
Top handler	250	Diesel	2002	8	Tier 4 diesel	2019
Top handler	260	Diesel	2006	3	Tier 4 diesel	2019
Top handler	260	Diesel	2007	8	Tier 4 diesel	2021
Top handler	260	Diesel	2008	15	Tier 4 diesel	2023
Top handler	335	Diesel	2011	3	Tier 4 diesel	2023
Top handler	370	Diesel	2014	1	Tier 4 diesel	2023
Yard tractor	195	LPG	2004	53	Alternative fuel (LPG) meeting Tier 4 standards	2019
Yard tractor	195	LPG	2007	59	Alternative fuel (LPG) meeting Tier 4 standards	2019
Yard tractor	195	LPG	2008	43	Alternative fuel (LPG) meeting Tier 4 standards	2023
Yard tractor	231	LPG	2011	23	Alternative fuel (LPG) meeting Tier 4 standards	2023

3.5 Rail – Switchers and Linehaul Locomotives

China Shipping terminal generates train trips to and from the on-dock rail yard at WBCT intermodal railyard, as well as in near- and off-dock rail yards. Containers arriving and departing via a near- or off-dock rail yard are transported between the terminal and rail yard by drayage trucks. Emissions associated with hauling containers by rail include diesel exhaust from PHL locomotives performing switching activities at the WBCT on-dock rail yard, switcher locomotives performing switching activities at the near- and off-dock rail yards, and line-haul locomotive transport within the SCAB and idling at the rail yards. No other activities within the near-dock or off-dock railyards were included in the emission analysis.

The assumptions below were applied to estimate peak day and annual emissions.

- Switcher and line haul locomotive emissions were calculated with emissions factors for locomotives by engine Tier level used in the Port 2013 Emissions Inventory (LADH 2014). These emission factors are based on EPA emission rates, except for VOC, NO_X, and PM_{10} NO_X for calendar years 2012 through 2015. These were modified to reflect compliance with the 1998 MOU, by which the railroads agreed to meet specified fleet-wide average emission rates from

their line haul and switching locomotives operating in the SoCAB, on a weighted average basis (LAHD 2014).

- Emission factors by Tier were combined into composite fleetwide average using the fleet mix percentages obtained through CARB Vision 2.0 Locomotive Module (CARB, 2015c). The baseline fleet mix for the line-haul locomotive fleet was obtained from the Port 2014 Inventory (LAHD 2015) and the future years used Vision Module-derived fleet mix for each year. The baseline fleet mix for PHL switchers was obtained from the 2014 Port Inventory (LAHD 2015) and it was conservatively assumed to remain constant through 2045 since the baseline fleet mix indicated the engines were composed of Tier 3 and Genset switcher engines; it is likely these would not be replaced by 2045 based on the equipment longevity, unless required.
- The fuel sulfur content was assumed to be 15 ppm for all analysis years, in accordance with California Diesel Fuel Regulation (CARB 2005).
- The transportation study for this SEIR provides the train and locomotive activity data used in the emission calculations based on annual throughput and mode splits for China Shipping railyard. The data includes average daily train counts, train length, number of locomotives per train, and average daily train-miles within the SCAB.
- Baseline train visits for line-haul locomotives at WBCT are shown in Table B1-108. Similar tables for future years are included in rail section of Appendix B1.
- Rail modeling also includes fractional activity of line-haul trains transporting container boxes from the CS terminal to near and off dock railyards via drayage trucks. These fractional trips are summarized in Table B1-108 for the baseline. Similar tables for future years are included in rail section of Appendix B1.
- Line haul locomotives were assumed to operate at the EPA line haul duty cycle, which reflects an average engine load factor.
- Switch engine locomotives were assumed to operate at the EPA switch locomotive duty cycle, which reflects an average engine load factor.
- Peak activity periods in railyard cargo loading and the drayage trucks are concurrent according to transportation modeling, so the annual-to-peak day peaking factor derived from transportation modeling of trucks was also used for determining the rail activity peak day for lineal and switchers. The 24hr profile of activity for drayage trucks was also used to determine 8hr and 1hr peaks for rail activity.

3.6 Worker Commute Trips

Worker vehicle emissions consist of light duty on-road vehicles used for workers commuting to and from the China Shipping terminal. Activities tracked consist of off-site driving to/from terminal and on-site driving to employee parking lot. On-site idling from worker vehicles was assumed to be negligible.

- Emissions from worker trips during the proposed project operation were calculated using worker trip on-site and off-site traffic flows by link provided by the traffic consultant.

- Emission factors from EMFAC2014 for gasoline light duty vehicles were used to represent worker vehicle emissions. The South Coast default light duty vehicle fleet mix was used for the emission factor derivation.
- PM_{10} and $PM_{2.5}$ emissions from paved road dust were calculated and added to the EMFAC2014 emissions. Road dust emission factors for on-terminal driving, off-terminal local streets, and freeways followed CARB's methodology to estimate entrained road dust emission factors; this involves using the equations in EPA's Compilation of Air Pollutant Emission Factors AP-42 (USEPA 2011) and CARB silt loading values for California roadways in its April 2014 guidance document for estimating entrained road dust emissions from paved roads (CARB 2014).

4.0 References

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Cargo Handling Equipment (CHE)

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2014

Table B1-1. 2014 FEIR Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	na	16	N/A	0%	-
Forklift	137	2014	Diesel	0.3	3	N/A	0%	785
Forklift	152	2014	Diesel	0.3	1	N/A	0%	-
Forklift	152	2014	Diesel	0.3	2	N/A	0%	1,109
Forklift	152	2014	Diesel	0.3	3	N/A	0%	896
Forklift	164	2014	Diesel	0.3	1	N/A	0%	72
Forklift	165	2014	Diesel	0.3	1	N/A	0%	43
Forklift	190	2014	Diesel	0.3	2	N/A	0%	1,022
Forklift	75	2014	Diesel	0.3	1	N/A	0%	55
Forklift	160	2014	Diesel	0.3	3	N/A	0%	597
Forklift	160	2014	Diesel	0.3	2	N/A	0%	232
Forklift	165	2014	Diesel	0.3	1	N/A	0%	1
Forklift	165	2014	Diesel	0.3	2	N/A	0%	627
Rub-trd Gantry Crane	197	0	Electric	0.2	1	N/A	0%	1,636
Rub-trd Gantry Crane	454	0	Electric	0.2	2	N/A	0%	2,701
Rub-trd Gantry Crane	600	0	Electric	0.2	1	N/A	0%	1,629
Rub-trd Gantry Crane	612	0	Electric	0.2	8	N/A	0%	15,784
Rub-trd Gantry Crane	685	0	Electric	0.2	1	N/A	0%	1,306
Rub-trd Gantry Crane	685	0	Electric	0.2	5	N/A	0%	10,707
Sweeper	100	2014	Diesel	0.68	1	N/A	0%	-
Top handler	250	2014	Diesel	0.59	8	N/A	0%	11,823
Top handler	260	2014	Diesel	0.59	6	N/A	0%	9,613
Top handler	260	2014	Diesel	0.59	6	N/A	0%	8,789
Top handler	260	2014	Diesel	0.59	15	N/A	0%	32,431
Top handler	335	2011	Diesel	0.59	3	N/A	0%	4,262
Top handler	370	2014	Diesel	0.59	1	N/A	0%	971
Truck	250	2014	Diesel	0.51	2	N/A	0%	1,161
Truck	250	2014	Diesel	0.51	2	N/A	0%	1,676
Truck	275	2014	Diesel	0.51	1	N/A	0%	650
Yard tractor	174	2000	LPG	0.39	2	N/A	0%	449
Yard tractor	195	2004	LPG	0.39	53	N/A	0%	63,798
Yard tractor	195	2007	LPG	0.39	59	N/A	0%	88,949
Yard tractor	195	2008	LPG	0.39	43	N/A	0%	67,604
Yard tractor	231	2011	LPG	0.39	23	N/A	0%	17,903

Notes

NA: not available

Quantity is the total number of equipment at WBCT terminal which are used for China Shipping and Yang Ming operations.

Operating Hours are only for China Shipping operations calculated by applying ratio

of China Shipping throughput/total WBCT throughput to average annual hours for WBCT terminal

Data obtained: 3/2/2016

Emissions Control Data

http://rypos.com/wp-content/uploads/RTG-Technology-Information-Package-final.pdf

http://www.epa.gov/cleandiesel/verification/verif-list.htm

Table B1-2. 2014 FEIR Mitigated Scenario- CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2014_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	0.118	2.774	2.181	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.111	2.750	2.172	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.111	2.750	2.172	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.111	2.750	2.172	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.097	2.708	2.155	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.105	2.733	2.165	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.070	0.954	0.261	0.009	0.008	0.010	852.458	0.012	-
2014_Forklift_Diesel	0.107	3.057	2.743	0.009	0.008	0.010	852.433	0.021	-
2014_Forklift_Diesel	0.103	2.727	2.163	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.103	2.727	2.163	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.105	2.733	2.165	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_Diesel	0.105	2.733	2.165	0.009	0.008	0.010	852.471	0.021	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Sweeper_Diesel	0.095	3.050	0.094	0.009	0.008	0.010	852.427	0.019	-
2014_Top handler_Diesel	0.080	0.973	0.263	0.009	0.008	0.010	852.572	0.011	-
2014_Top handler_Diesel	0.088	0.991	0.266	0.009	0.009	0.008	850.994	0.011	-
2014_Top handler_Diesel	0.088	0.991	0.266	0.009	0.009	0.008	850.994	0.011	-
2014_Top handler_Diesel	0.088	0.991	0.266	0.009	0.009	0.008	850.994	0.011	-
2014_Top handler_Diesel	0.236	1.073	1.430	0.011	0.010	0.008	854.065	0.027	-
2014_Top handler_Diesel	0.070	0.946	0.261	0.009	0.008	0.008	850.994	0.011	-
2014_Truck_Diesel	0.067	0.948	0.260	0.009	0.008	0.010	852.412	0.013	-
2014_Truck_Diesel	0.067	0.948	0.260	0.009	0.008	0.010	852.412	0.013	-
2014_Truck_Diesel	0.064	0.943	0.259	0.009	0.008	0.008	852.493	0.013	-
2014_Yard tractor_LPG	1.557	20.773	11.026	0.060	0.060	-	674.859	0.220	-
2014_Yard tractor_LPG	1.498	34.964	5.998	0.060	0.060	-	674.859	0.206	-
2014_Yard tractor_LPG	2.035	32.242	6.339	0.060	0.060	-	674.859	0.062	-
2014_Yard tractor_LPG	0.837	2.620	1.285	0.060	0.060	-	674.859	0.056	-
2014_Yard tractor_LPG	0.119	17.961	0.537	0.060	0.060	-	674.859	0.039	-

Note: Emission factors for diesel equiment from EPA Offroad CI Engine Tier Regulations

Propane equipment emission factors are from ARB. EFs for remaining pollutants are based on CNG forklift emission rates from Offroad2007.

Table B1-3. 2014 FEIR Mitigated Scenario Annual Mass Emissions **FEIR Mitigated Scenario**

2014		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2014_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	32,248	0.00	0.10	0.08	0.00	0.00	0.00	30.30	0.00	-	0.00
2014_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	50,578	0.01	0.15	0.12	0.00	0.00	0.00	47.53	0.00	-	0.00
2014_Forklift_Diesel	40,845	0.00	0.12	0.10	0.00	0.00	0.00	38.38	0.00	-	0.00
2014_Forklift_Diesel	3,567	0.00	0.01	0.01	0.00	0.00	0.00	3.35	0.00	-	0.00
2014_Forklift_Diesel	2,147	0.00	0.01	0.01	0.00	0.00	0.00	2.02	0.00	-	0.00
2014_Forklift_Diesel	58,279	0.00	0.06	0.02	0.00	0.00	0.00	54.76	0.00	-	0.00
2014_Forklift_Diesel	1,235	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	-	0.00
2014_Forklift_Diesel	28,653	0.00	0.09	0.07	0.00	0.00	0.00	26.92	0.00	-	0.00
2014_Forklift_Diesel	11,155	0.00	0.03	0.03	0.00	0.00	0.00	10.48	0.00	-	0.00
2014_Forklift_Diesel	34	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	-	0.00
2014_Forklift_Diesel	31,024	0.00	0.09	0.07	0.00	0.00	0.00	29.15	0.00	-	0.00
2014_Rub-trd Gantry Crane_Electric	64,444	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	245,228	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	195,462	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	1,932,013	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	178,968	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	1,466,830	-	-	-	-	-	-	-	-	-	-
2014_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2014_Top handler_Diesel	1,743,853	0.15	1.87	0.51	0.02	0.02	0.02	1,638.84	0.02	-	0.02
2014_Top handler_Diesel	1,474,562	0.14	1.61	0.43	0.02	0.01	0.01	1,383.21	0.02	-	0.02
2014_Top handler_Diesel	1,348,174	0.13	1.47	0.39	0.01	0.01	0.01	1,264.65	0.02	-	0.01
2014_Top handler_Diesel	4,974,868	0.49	5.43	1.46	0.05	0.05	0.05	4,666.65	0.06	-	0.05
2014_Top handler_Diesel	842,354	0.22	1.00	1.33	0.01	0.01	0.01	793.02	0.03	-	0.01
2014_Top handler_Diesel	211,957	0.02	0.22	0.06	0.00	0.00	0.00	198.82	0.00	-	0.00
2014_Truck_Diesel	148,070	0.01	0.15	0.04	0.00	0.00	0.00	139.13	0.00	-	0.00
2014_Truck_Diesel	213,726	0.02	0.22	0.06	0.00	0.00	0.00	200.82	0.00	-	0.00
2014_Truck_Diesel	91,227	0.01	0.09	0.03	0.00	0.00	0.00	85.73	0.00	-	0.00
2014_Yard tractor_LPG	30,438	0.05	0.70	0.37	0.00	0.00	-	22.64	0.01	-	-
2014_Yard tractor_LPG	4,851,860	8.01	186.99	32.08	0.32	0.32	-	3,609.26	1.10	-	-
2014_Yard tractor_LPG	6,764,593	15.17	240.41	47.27	0.44	0.44	-	5,032.13	0.46	-	-
2014_Yard tractor_LPG	5,141,295	4.75	14.85	7.28	0.34	0.34	-	3,824.57	0.32	-	-
2014_Yard tractor_LPG	1,612,894	0.21	31.93	0.95	0.11	0.11	-	1,199.82	0.07	-	-

Table B1-4. 2014 FEIR Mitigated Scenario Peak Day Emissions

FEIR Mitigated Scenario

2014		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2014_Electric Wharf Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	0.0042	0.04	0.82	0.64	0.00	0.00	0.00	251.99	0.01	-	0.00
2014_Forklift_Diesel	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	0.0042	0.05	1.27	1.01	0.00	0.00	0.00	395.23	0.01	-	0.00
2014_Forklift_Diesel	0.0042	0.04	1.03	0.81	0.00	0.00	0.00	319.18	0.01	-	0.00
2014_Forklift_Diesel	0.0042	0.00	0.09	0.07	0.00	0.00	0.00	27.87	0.00	-	0.00
2014_Forklift_Diesel	0.0042	0.00	0.05	0.04	0.00	0.00	0.00	16.77	0.00	-	0.00
2014_Forklift_Diesel	0.0042	0.04	0.51	0.14	0.00	0.00	0.01	455.40	0.01	-	0.00
2014_Forklift_Diesel	0.0042	0.00	0.03	0.03	0.00	0.00	0.00	9.65	0.00	-	0.00
2014_Forklift_Diesel	0.0042	0.03	0.72	0.57	0.00	0.00	0.00	223.90	0.01	-	0.00
2014_Forklift_Diesel	0.0042	0.01	0.28	0.22	0.00	0.00	0.00	87.17	0.00	-	0.00
2014_Forklift_Diesel	0.0042	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00
2014_Forklift_Diesel	0.0042	0.03	0.78	0.62	0.00	0.00	0.00	242.43	0.01	-	0.00
2014_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Sweeper_Diesel	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Top handler_Diesel	0.0042	1.27	15.56	4.21	0.15	0.14	0.15	13,628.61	0.17	-	0.15
2014_Top handler_Diesel	0.0042	1.20	13.39	3.59	0.13	0.12	0.11	11,502.72	0.14	-	0.13
2014_Top handler_Diesel	0.0042	1.09	12.24	3.28	0.12	0.11	0.10	10,516.79	0.13	-	0.12
2014_Top handler_Diesel	0.0042	4.03	45.18	12.12	0.43	0.40	0.38	38,807.78	0.48	-	0.43
2014_Top handler_Diesel	0.0042	1.82	8.28	11.04	0.09	0.08	0.06	6,594.72	0.21	-	0.09
2014_Top handler_Diesel	0.0042	0.14	1.84	0.51	0.02	0.02	0.02	1,653.42	0.02	-	0.02
2014_Truck_Diesel	0.0042	0.09	1.29	0.35	0.01	0.01	0.01	1,156.99	0.02	-	0.01
2014_Truck_Diesel	0.0042	0.13	1.86	0.51	0.02	0.02	0.02	1,670.00	0.03	-	0.02
2014_Truck_Diesel	0.0042	0.05	0.79	0.22	0.01	0.01	0.01	712.89	0.01	-	0.01
2014_Yard tractor_LPG	0.0042	0.43	5.80	3.08	0.02	0.02	-	188.30	0.06	-	-
2014_Yard tractor_LPG	0.0042	66.62	1,555.04	266.78	2.65	2.65	-	30,014.59	9.15	-	-
2014_Yard tractor_LPG	0.0042	126.16	1,999.25	393.06	3.70	3.70	-	41,847.14	3.86	-	-
2014_Yard tractor_LPG	0.0042	39.47	123.46	60.55	2.81	2.81	-	31,805.09	2.66	-	-
2014_Yard tractor_LPG	0.0042	1.75	265.55	7.93	0.88	0.88	-	9,977.69	0.57	-	-

8hr/24hr Peaking Factor*: 0.489622946

**Note: Using same peaking factor that is applied to trucks*

Table B1-5. 2014 FEIR Mitigated Scenario Eight Hour Peak Emissions **FEIR Mitigated Scenario**

2014	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2014_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	0.02	0.40	0.32	0.00	0.00	0.00	123.38	0.00	-	0.00
2014_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	0.03	0.62	0.49	0.00	0.00	0.00	193.51	0.00	-	0.00
2014_Forklift_Diesel	0.02	0.50	0.40	0.00	0.00	0.00	156.28	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.04	0.03	0.00	0.00	0.00	13.65	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.03	0.02	0.00	0.00	0.00	8.21	0.00	-	0.00
2014_Forklift_Diesel	0.02	0.25	0.07	0.00	0.00	0.00	222.98	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	4.72	0.00	-	0.00
2014_Forklift_Diesel	0.01	0.35	0.28	0.00	0.00	0.00	109.63	0.00	-	0.00
2014_Forklift_Diesel	0.01	0.14	0.11	0.00	0.00	0.00	42.68	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	-	0.00
2014_Forklift_Diesel	0.01	0.38	0.30	0.00	0.00	0.00	118.70	0.00	-	0.00
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-
2014_Top handler_Diesel	0.62	7.62	2.06	0.07	0.07	0.08	6,672.88	0.08	-	0.07
2014_Top handler_Diesel	0.59	6.56	1.76	0.06	0.06	0.06	5,631.99	0.07	-	0.06
2014_Top handler_Diesel	0.54	5.99	1.61	0.06	0.05	0.05	5,149.26	0.06	-	0.06
2014_Top handler_Diesel	1.98	22.12	5.93	0.21	0.19	0.19	19,001.18	0.24	-	0.21
2014_Top handler_Diesel	0.89	4.06	5.41	0.04	0.04	0.03	3,228.93	0.10	-	0.04
2014_Top handler_Diesel	0.07	0.90	0.25	0.01	0.01	0.01	809.55	0.01	-	0.01
2014_Truck_Diesel	0.04	0.63	0.17	0.01	0.01	0.01	566.49	0.01	-	0.01
2014_Truck_Diesel	0.06	0.91	0.25	0.01	0.01	0.01	817.67	0.01	-	0.01
2014_Truck_Diesel	0.03	0.39	0.11	0.00	0.00	0.00	349.05	0.01	-	0.00
2014_Yard tractor_LPG	0.21	2.84	1.51	0.01	0.01	-	92.19	0.03	-	-
2014_Yard tractor_LPG	32.62	761.38	130.62	1.30	1.30	-	14,695.83	4.48	-	-
2014_Yard tractor_LPG	61.77	978.88	192.45	1.81	1.81	-	20,489.32	1.89	-	-
2014_Yard tractor_LPG	19.32	60.45	29.65	1.38	1.38	-	15,572.50	1.30	-	-
2014_Yard tractor_LPG	0.86	130.02	3.88	0.43	0.43	-	4,885.31	0.28	-	-

1hr/24hr Peaking Factor*: 0.070410261

**Note: Using same peaking factor that is applied to trucks*

Table B1-6. 2014 FEIR Mitigated Scenario One Hour Peak Emissions **FEIR Mitigated Scenario**

2014	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2014	-	-	-	-	-	-	-	-	-	-
General name	0.00	0.06	0.05	0.00	0.00	0.00	17.74	0.00	-	0.00
2014_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	0.00	0.09	0.07	0.00	0.00	0.00	27.83	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.07	0.06	0.00	0.00	0.00	22.47	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	1.96	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.04	0.01	0.00	0.00	0.00	32.06	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.05	0.04	0.00	0.00	0.00	15.76	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	6.14	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-	0.00
2014_Forklift_Diesel	0.00	0.05	0.04	0.00	0.00	0.00	17.07	0.00	-	0.00
2014_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2014_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_Electric	0.09	1.10	0.30	0.01	0.01	0.01	959.59	0.01	-	0.01
2014_Sweeper_Diesel	0.08	0.94	0.25	0.01	0.01	0.01	809.91	0.01	-	0.01
2014_Top handler_Diesel	0.08	0.86	0.23	0.01	0.01	0.01	740.49	0.01	-	0.01
2014_Top handler_Diesel	0.28	3.18	0.85	0.03	0.03	0.03	2,732.47	0.03	-	0.03
2014_Top handler_Diesel	0.13	0.58	0.78	0.01	0.01	0.00	464.34	0.01	-	0.01
2014_Top handler_Diesel	0.01	0.13	0.04	0.00	0.00	0.00	116.42	0.00	-	0.00
2014_Top handler_Diesel	0.01	0.09	0.02	0.00	0.00	0.00	81.46	0.00	-	0.00
2014_Top handler_Diesel	0.01	0.13	0.04	0.00	0.00	0.00	117.59	0.00	-	0.00
2014_Truck_Diesel	0.00	0.06	0.02	0.00	0.00	0.00	50.19	0.00	-	0.00
2014_Truck_Diesel	0.03	0.41	0.22	0.00	0.00	-	13.26	0.00	-	-
2014_Truck_Diesel	4.69	109.49	18.78	0.19	0.19	-	2,113.34	0.64	-	-
2014_Yard tractor_LPG	8.88	140.77	27.68	0.26	0.26	-	2,946.47	0.27	-	-
2014_Yard tractor_LPG	2.78	8.69	4.26	0.20	0.20	-	2,239.40	0.19	-	-
2014_Yard tractor_LPG	0.12	18.70	0.56	0.06	0.06	-	702.53	0.04	-	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2023

Table B1-7. 2023 FEIR Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0	N/A	0%	-
Forklift	75	2014	Diesel	0.3	1	N/A	0%	369
Forklift	137	2014	Diesel	0.3	1	N/A	0%	822
Forklift	152	2014	Diesel	0.3	2	N/A	0%	3,920
Forklift	152	2014	Diesel	0.3	2	N/A	0%	1,625
Forklift	160	2014	Diesel	0.3	2	N/A	0%	1,428
Forklift	160	2014	Diesel	0.3	2	N/A	0%	373
Forklift	165	2014	Diesel	0.3	2	N/A	0%	500
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	197	0	Electric	0.2	5	N/A	0%	14,366
Sweeper	100	2014	Diesel	0.68	0	N/A	0%	-
Top handler	250	2014	Diesel	0.59	8	N/A	0%	14,343
Top handler	260	2014	Diesel	0.59	3	N/A	0%	5,658
Top handler	260	2014	Diesel	0.59	8	N/A	0%	13,213
Top handler	260	2014	Diesel	0.59	15	N/A	0%	46,244
Top handler	335	2011	Diesel	0.59	3	N/A	0%	8,668
Top handler	370	2014	Diesel	0.59	1	N/A	0%	2,947
Truck	250	2014	Diesel	0.51	2	N/A	0%	1,623
Truck	250	2014	Diesel	0.51	2	N/A	0%	2,342
Truck	275	2014	Diesel	0.51	1	N/A	0%	909
Yard tractor	195	2014	LNG	0.39	53	N/A	0%	92,388
Yard tractor	195	2014	LNG	0.39	59	N/A	0%	125,838
Yard tractor	195	2014	LNG	0.39	43	N/A	0%	107,679
Yard tractor	231	2014	LNG	0.39	23	N/A	0%	35,295

Table B1-8. 2023 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2023_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Forklift_Diesel	0.183	3.290	2.847	0.011	0.010	0.010	852.445	0.060	-
2023_Forklift_Diesel	0.266	3.236	2.363	0.012	0.011	0.010	852.469	0.057	-
2023_Forklift_Diesel	0.463	3.852	2.605	0.015	0.014	0.010	852.469	0.057	-
2023_Forklift_Diesel	0.252	3.191	2.345	0.011	0.010	0.010	852.469	0.057	-
2023_Forklift_Diesel	0.231	3.127	2.320	0.011	0.010	0.010	852.469	0.057	-
2023_Forklift_Diesel	0.132	2.817	2.198	0.009	0.008	0.010	852.469	0.057	-
2023_Forklift_Diesel	0.150	2.873	2.220	0.009	0.009	0.010	852.469	0.057	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Sweeper_Diesel	0.095	3.050	0.094	0.009	0.008	0.010	852.445	0.060	-
2023_Top handler_Diesel	0.252	1.313	0.311	0.014	0.013	0.010	851.993	0.031	-
2023_Top handler_Diesel	0.266	1.341	0.314	0.014	0.013	0.008	854.334	0.031	-
2023_Top handler_Diesel	0.241	1.291	0.307	0.013	0.012	0.008	854.334	0.031	-
2023_Top handler_Diesel	0.389	1.583	0.348	0.017	0.016	0.008	854.334	0.031	-
2023_Top handler_Diesel	0.670	1.484	1.809	0.018	0.017	0.008	853.916	0.047	-
2023_Top handler_Diesel	0.354	1.365	0.338	0.016	0.015	0.008	854.334	0.031	-
2023_Truck_Diesel	0.158	1.128	0.285	0.011	0.010	0.010	852.533	0.031	-
2023_Truck_Diesel	0.222	1.253	0.302	0.013	0.012	0.010	852.533	0.031	-
2023_Truck_Diesel	0.171	1.153	0.288	0.012	0.011	0.008	852.426	0.031	-
2023_Yard tractor_LNG	0.243	1.295	0.308	0.013	0.012	-	674.859	0.062	-
2023_Yard tractor_LNG	0.285	1.379	0.320	0.014	0.013	-	674.859	0.045	-
2023_Yard tractor_LNG	0.322	1.452	0.330	0.015	0.014	-	674.859	0.039	-
2023_Yard tractor_LNG	0.215	1.240	0.300	0.013	0.012	-	674.859	0.092	-

Table B1-9. 2023 FEIR Mitigated Scenario Annual Mass Emissions

2023		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2023_Forklift_Diesel	8,308	0.00	0.03	0.03	0.00	0.00	0.00	7.81	0.00	-	0.00
2023_Forklift_Diesel	33,768	0.01	0.12	0.09	0.00	0.00	0.00	31.73	0.00	-	0.00
2023_Forklift_Diesel	178,774	0.09	0.76	0.51	0.00	0.00	0.00	167.99	0.01	-	0.00
2023_Forklift_Diesel	74,118	0.02	0.26	0.19	0.00	0.00	0.00	69.65	0.00	-	0.00
2023_Forklift_Diesel	68,543	0.02	0.24	0.18	0.00	0.00	0.00	64.41	0.00	-	0.00
2023_Forklift_Diesel	17,917	0.00	0.06	0.04	0.00	0.00	0.00	16.84	0.00	-	0.00
2023_Forklift_Diesel	24,739	0.00	0.08	0.06	0.00	0.00	0.00	23.25	0.00	-	0.00
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	566,022	-	-	-	-	-	-	-	-	-	-
2023_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2023_Top handler_Diesel	2,115,523	0.59	3.06	0.72	0.03	0.03	0.02	1,986.78	0.07	-	0.03
2023_Top handler_Diesel	867,978	0.25	1.28	0.30	0.01	0.01	0.01	817.40	0.03	-	0.01
2023_Top handler_Diesel	2,026,837	0.54	2.88	0.69	0.03	0.03	0.02	1,908.73	0.07	-	0.03
2023_Top handler_Diesel	7,093,887	3.04	12.38	2.72	0.13	0.12	0.07	6,680.50	0.24	-	0.13
2023_Top handler_Diesel	1,713,275	1.27	2.80	3.42	0.03	0.03	0.02	1,612.65	0.09	-	0.03
2023_Top handler_Diesel	643,252	0.25	0.97	0.24	0.01	0.01	0.01	605.77	0.02	-	0.01
2023_Truck_Diesel	206,909	0.04	0.26	0.06	0.00	0.00	0.00	194.44	0.01	-	0.00
2023_Truck_Diesel	298,653	0.07	0.41	0.10	0.00	0.00	0.00	280.66	0.01	-	0.00
2023_Truck_Diesel	127,477	0.02	0.16	0.04	0.00	0.00	0.00	119.78	0.00	-	0.00
2023_Yard tractor_LNG	7,026,094	1.88	10.03	2.39	0.10	0.10	-	5,226.66	0.48	-	-
2023_Yard tractor_LNG	9,569,984	3.01	14.55	3.37	0.15	0.14	-	7,119.04	0.47	-	-
2023_Yard tractor_LNG	8,189,010	2.91	13.11	2.98	0.14	0.13	-	6,091.74	0.35	-	-
2023_Yard tractor_LNG	3,179,717	0.75	4.35	1.05	0.04	0.04	-	2,365.37	0.32	-	-

Table B1-10. 2023 FEIR Mitigated Scenario Peak Day Emissions

2023		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Diesel	0.0040	0.01	0.24	0.21	0.00	0.00	0.00	63	0.00	-	0.00
2023_Forklift_Diesel	0.0040	0.08	0.98	0.71	0.00	0.00	0.00	257	0.02	-	0.00
2023_Forklift_Diesel	0.0040	0.74	6.15	4.16	0.02	0.02	0.02	1,360	0.09	-	0.02
2023_Forklift_Diesel	0.0040	0.17	2.11	1.55	0.01	0.01	0.01	564	0.04	-	0.01
2023_Forklift_Diesel	0.0040	0.14	1.91	1.42	0.01	0.01	0.01	522	0.03	-	0.01
2023_Forklift_Diesel	0.0040	0.02	0	0.35	0.00	0.00	0.00	136	0.01	-	0.00
2023_Forklift_Diesel	0.0040	0.03	0.63	0.49	0.00	0.00	0.00	188.26	0.01	-	0.00
2023_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Top handler_Diesel	0.0040	4.76	24.80	5.87	0.26	0.24	0.18	16,090.36	0.59	-	0.26
2023_Top handler_Diesel	0.0040	2.06	10.39	2.44	0.11	0.10	0.06	6,619.85	0.24	-	0.11
2023_Top handler_Diesel	0.0040	4.36	23.36	5.56	0.24	0.22	0.15	15,458.19	0.56	-	0.24
2023_Top handler_Diesel	0.0040	24.62	100.24	22.04	1.08	1.00	0.53	54,103.34	1.97	-	1.08
2023_Top handler_Diesel	0.0040	10.25	22.69	27.67	0.28	0.26	0.13	13,060.34	0.72	-	0.28
2023_Top handler_Diesel	0.0040	2.03	7.84	1.94	0.09	0.09	0.05	4,905.93	0.18	-	0.09
2023_Truck_Diesel	0.0040	0.29	2.08	0.53	0.02	0.02	0.02	1,574.71	0.06	-	0.02
2023_Truck_Diesel	0.0040	0.59	3.34	0.81	0.03	0.03	0.03	2,272.95	0.08	-	0.03
2023_Truck_Diesel	0.0040	0.19	1.31	0.33	0.01	0.01	0.01	970.06	0.04	-	0.01
2023_Yard tractor_LNG	0.0040	15.21	81.20	19.32	0.84	0.77	-	42,329.12	3.90	-	-
2023_Yard tractor_LNG	0.0040	24.38	117.82	27.31	1.24	1.14	-	57,654.93	3.81	-	-
2023_Yard tractor_LNG	0.0040	23.56	106.14	24.11	1.13	1.04	-	49,335.18	2.83	-	-
2023_Yard tractor_LNG	0.0040	6.10	35.20	8.53	0.36	0.33	-	19,156.39	2.61	-	-

8hr/24hr Peaking Factor*: 0.529716683

**Note: Using same peaking factor that is applied to trucks*

Table B1-11. 2023 FEIR Mitigated Scenario Eight Hour Peak Emissions

2023	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Diesel	0.01	0.13	0.11	0.00	0.00	0.00	33.49	0.00	0.00	0.00
2023_Forklift_Diesel	0.04	0.52	0.38	0.00	0.00	0.00	136.13	0.01	0.00	0.00
2023_Forklift_Diesel	0.39	3.26	2.20	0.01	0.01	0.01	720.67	0.05	0.00	0.01
2023_Forklift_Diesel	0.09	1.12	0.82	0.00	0.00	0.00	298.78	0.02	0.00	0.00
2023_Forklift_Diesel	0.07	1.01	0.75	0.00	0.00	0.00	276.31	0.02	0.00	0.00
2023_Forklift_Diesel	0.01	0.24	0.19	0.00	0.00	0.00	72.23	0.00	0.00	0.00
2023_Forklift_Diesel	0.02	0.34	0.26	0.00	0.00	0.00	99.73	0.01	0.00	0.00
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Top handler_Diesel	2.52	13.14	3.11	0.14	0.13	0.10	8523.33	0.31	0.00	0.14
2023_Top handler_Diesel	1.09	5.51	1.29	0.06	0.05	0.03	3506.65	0.13	0.00	0.06
2023_Top handler_Diesel	2.31	12.37	2.95	0.13	0.12	0.08	8188.46	0.30	0.00	0.13
2023_Top handler_Diesel	13.04	53.10	11.67	0.57	0.53	0.28	28659.44	1.04	0.00	0.57
2023_Top handler_Diesel	5.43	12.02	14.65	0.15	0.14	0.07	6918.28	0.38	0.00	0.15
2023_Top handler_Diesel	1.08	4.15	1.03	0.05	0.05	0.03	2598.75	0.09	0.00	0.05
2023_Truck_Diesel	0.15	1.10	0.28	0.01	0.01	0.01	834.15	0.03	0.00	0.01
2023_Truck_Diesel	0.31	1.77	0.43	0.02	0.02	0.01	1204.02	0.04	0.00	0.02
2023_Truck_Diesel	0.10	0.70	0.17	0.01	0.01	0.01	513.86	0.02	0.00	0.01
2023_Yard tractor_LNG	8.06	43.01	10.23	0.44	0.41	0.00	22422.44	2.07	0.00	-
2023_Yard tractor_LNG	12.92	62.41	14.47	0.66	0.60	0.00	30540.78	2.02	0.00	-
2023_Yard tractor_LNG	12.48	56.22	12.77	0.60	0.55	0.00	26133.67	1.50	0.00	-
2023_Yard tractor_LNG	3.23	18.64	4.52	0.19	0.18	0.00	10147.46	1.38	0.00	-

1hr/24hr Peaking Factor*: 0.073685169
**Note: Using same peaking factor that is applied to trucks*

Table B1-12. 2023 FEIR Mitigated Scenario One Hour Peak Emissions

2023	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	4.66	0.00	0.00	0.00
2023_Forklift_Diesel	0.01	0.07	0.05	0.00	0.00	0.00	18.94	0.00	0.00	0.00
2023_Forklift_Diesel	0.05	0.45	0.31	0.00	0.00	0.00	100.25	0.01	0.00	0.00
2023_Forklift_Diesel	0.01	0.16	0.11	0.00	0.00	0.00	41.56	0.00	0.00	0.00
2023_Forklift_Diesel	0.01	0.14	0.10	0.00	0.00	0.00	38.44	0.00	0.00	0.00
2023_Forklift_Diesel	0.00	0.03	0.03	0.00	0.00	0.00	10.05	0.00	0.00	0.00
2023_Forklift_Diesel	0.00	0.05	0.04	0.00	0.00	0.00	13.87	0.00	0.00	0.00
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Top handler_Diesel	0.35	1.83	0.43	0.02	0.02	0.01	1185.62	0.04	0.00	0.02
2023_Top handler_Diesel	0.15	0.77	0.18	0.01	0.01	0.00	487.79	0.02	0.00	0.01
2023_Top handler_Diesel	0.32	1.72	0.41	0.02	0.02	0.01	1139.04	0.04	0.00	0.02
2023_Top handler_Diesel	1.81	7.39	1.62	0.08	0.07	0.04	3986.61	0.14	0.00	0.08
2023_Top handler_Diesel	0.76	1.67	2.04	0.02	0.02	0.01	962.35	0.05	0.00	0.02
2023_Top handler_Diesel	0.15	0.58	0.14	0.01	0.01	0.00	361.49	0.01	0.00	0.01
2023_Truck_Diesel	0.02	0.15	0.04	0.00	0.00	0.00	116.03	0.00	0.00	0.00
2023_Truck_Diesel	0.04	0.25	0.06	0.00	0.00	0.00	167.48	0.01	0.00	0.00
2023_Truck_Diesel	0.01	0.10	0.02	0.00	0.00	0.00	71.48	0.00	0.00	0.00
2023_Yard tractor_LNG	1.12	5.98	1.42	0.06	0.06	0.00	3119.03	0.29	0.00	-
2023_Yard tractor_LNG	1.80	8.68	2.01	0.09	0.08	0.00	4248.31	0.28	0.00	-
2023_Yard tractor_LNG	1.74	7.82	1.78	0.08	0.08	0.00	3635.27	0.21	0.00	-
2023_Yard tractor_LNG	0.45	2.59	0.63	0.03	0.02	0.00	1411.54	0.19	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2030

Table B1-13. 2030 FEIR Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0	N/A	0%	-
Forklift	75	2030	Diesel	0.3	1	N/A	0%	412
Forklift	137	2030	Diesel	0.3	1	N/A	0%	917
Forklift	152	2030	Diesel	0.3	2	N/A	0%	4,377
Forklift	152	2030	Diesel	0.3	2	N/A	0%	1,815
Forklift	160	2030	Diesel	0.3	2	N/A	0%	1,594
Forklift	160	2030	Diesel	0.3	2	N/A	0%	417
Forklift	165	2030	Diesel	0.3	2	N/A	0%	558
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	197	0	Electric	0.2	5	N/A	0%	16,040
Sweeper	100	2030	Diesel	0.68	0	N/A	0%	-
Top handler	250	2030	Diesel	0.59	8	N/A	0%	16,014
Top handler	260	2030	Diesel	0.59	3	N/A	0%	6,318
Top handler	260	2030	Diesel	0.59	8	N/A	0%	14,753
Top handler	260	2030	Diesel	0.59	15	N/A	0%	51,633
Top handler	335	2027	Diesel	0.59	3	N/A	0%	9,678
Top handler	370	2030	Diesel	0.59	1	N/A	0%	3,290
Truck	250	2026	Diesel	0.51	2	N/A	0%	1,812
Truck	250	2026	Diesel	0.51	2	N/A	0%	2,615
Truck	275	2026	Diesel	0.51	1	N/A	0%	1,015
Yard tractor	195	2026	LNG	0.39	53	N/A	0%	103,154
Yard tractor	195	2026	LNG	0.39	59	N/A	0%	140,503
Yard tractor	195	2026	LNG	0.39	43	N/A	0%	120,228
Yard tractor	231	2026	LNG	0.39	23	N/A	0%	39,408

Table B1-14. 2030 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2030_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Forklift_Diesel	0.114	3.076	2.751	0.009	0.008	0.010	852.441	0.016	-
2030_Forklift_Diesel	0.061	2.751	0.258	0.009	0.008	0.010	852.444	0.012	-
2030_Forklift_Diesel	0.074	2.821	0.262	0.009	0.008	0.010	852.444	0.012	-
2030_Forklift_Diesel	0.061	2.750	0.258	0.009	0.008	0.010	852.444	0.012	-
2030_Forklift_Diesel	0.060	2.744	0.258	0.009	0.008	0.010	852.444	0.012	-
2030_Forklift_Diesel	0.055	2.712	0.257	0.009	0.008	0.010	852.444	0.012	-
2030_Forklift_Diesel	0.055	2.715	0.257	0.009	0.008	0.010	852.444	0.012	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.440	0.015	-
2030_Top handler_Diesel	0.072	0.958	0.261	0.009	0.008	0.010	852.499	0.011	-
2030_Top handler_Diesel	0.073	0.960	0.261	0.009	0.008	0.008	851.853	0.011	-
2030_Top handler_Diesel	0.070	0.955	0.261	0.009	0.008	0.008	851.853	0.011	-
2030_Top handler_Diesel	0.086	0.985	0.265	0.009	0.009	0.008	851.853	0.011	-
2030_Top handler_Diesel	0.176	1.103	0.290	0.012	0.011	0.008	850.344	0.018	-
2030_Top handler_Diesel	0.084	0.967	0.265	0.009	0.009	0.008	851.853	0.011	-
2030_Truck_Diesel	0.105	1.024	0.270	0.010	0.009	0.010	852.423	0.031	-
2030_Truck_Diesel	0.137	1.087	0.279	0.011	0.010	0.010	852.423	0.031	-
2030_Truck_Diesel	0.112	1.037	0.272	0.010	0.009	0.008	852.456	0.031	-
2030_Yard tractor_LNG	0.146	1.104	0.281	0.011	0.010	-	674.859	0.033	-
2030_Yard tractor_LNG	0.167	1.145	0.287	0.011	0.011	-	674.859	0.086	-
2030_Yard tractor_LNG	0.187	1.184	0.293	0.012	0.011	-	674.859	0.080	-
2030_Yard tractor_LNG	0.135	1.082	0.278	0.011	0.010	-	674.859	0.062	-

Table B1-15. 2030 FEIR Mitigated Scenario Annual Mass Emissions

2030		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2030_Forklift_Diesel	9,277	0.00	0.03	0.03	0.00	0.00	0.00	8.72	0.00	-	0.00
2030_Forklift_Diesel	37,704	0.00	0.11	0.01	0.00	0.00	0.00	35.43	0.00	-	0.00
2030_Forklift_Diesel	199,607	0.02	0.62	0.06	0.00	0.00	0.00	187.56	0.00	-	0.00
2030_Forklift_Diesel	82,755	0.01	0.25	0.02	0.00	0.00	0.00	77.76	0.00	-	0.00
2030_Forklift_Diesel	76,530	0.01	0.23	0.02	0.00	0.00	0.00	71.91	0.00	-	0.00
2030_Forklift_Diesel	20,005	0.00	0.06	0.01	0.00	0.00	0.00	18.80	0.00	-	0.00
2030_Forklift_Diesel	27,622	0.00	0.08	0.01	0.00	0.00	0.00	25.95	0.00	-	0.00
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	631,983	-	-	-	-	-	-	-	-	-	-
2030_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2030_Top handler_Diesel	2,362,055	0.19	2.49	0.68	0.02	0.02	0.02	2,219.63	0.03	-	0.02
2030_Top handler_Diesel	969,128	0.08	1.03	0.28	0.01	0.01	0.01	910.00	0.01	-	0.01
2030_Top handler_Diesel	2,263,034	0.18	2.38	0.65	0.02	0.02	0.02	2,124.97	0.03	-	0.02
2030_Top handler_Diesel	7,920,571	0.75	8.60	2.31	0.08	0.08	0.07	7,437.35	0.09	-	0.08
2030_Top handler_Diesel	1,912,931	0.37	2.32	0.61	0.02	0.02	0.02	1,793.04	0.04	-	0.02
2030_Top handler_Diesel	718,214	0.07	0.77	0.21	0.01	0.01	0.01	674.40	0.01	-	0.01
2030_Truck_Diesel	231,021	0.03	0.26	0.07	0.00	0.00	0.00	217.07	0.01	-	0.00
2030_Truck_Diesel	333,457	0.05	0.40	0.10	0.00	0.00	0.00	313.32	0.01	-	0.00
2030_Truck_Diesel	142,332	0.02	0.16	0.04	0.00	0.00	0.00	133.74	0.00	-	0.00
2030_Yard tractor_LNG	7,844,878	1.26	9.55	2.43	0.09	0.09	-	5,835.75	0.28	-	-
2030_Yard tractor_LNG	10,685,221	1.96	13.49	3.38	0.13	0.12	-	7,948.66	1.01	-	-
2030_Yard tractor_LNG	9,143,315	1.88	11.93	2.95	0.12	0.11	-	6,801.65	0.81	-	-
2030_Yard tractor_LNG	3,550,265	0.53	4.23	1.09	0.04	0.04	-	2,641.02	0.24	-	-

Table B1-16. 2030 FEIR Mitigated Scenario Peak Day Emissions

2030		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Diesel	0.0040	0.01	0.25	0.23	0.00	0.00	0.00	71	0.00	-	0.00
2030_Forklift_Diesel	0.0040	0.02	0.93	0.09	0.00	0.00	0.00	287	0.00	-	0.00
2030_Forklift_Diesel	0.0040	0.13	5.03	0.47	0.02	0.02	0.02	1,519	0.02	-	0.02
2030_Forklift_Diesel	0.0040	0.05	2.03	0.19	0.01	0.01	0.01	630	0.01	-	0.01
2030_Forklift_Diesel	0.0040	0.04	1.87	0.18	0.01	0.01	0.01	582	0.01	-	0.01
2030_Forklift_Diesel	0.0040	0.01	0	0.05	0.00	0.00	0.00	152	0.00	-	0.00
2030_Forklift_Diesel	0.0040	0.01	0.67	0.06	0.00	0.00	0.00	210.20	0.00	-	0.00
2030_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Top handler_Diesel	0.0040	1.51	20.20	5.51	0.19	0.17	0.20	17,976.12	0.22	-	0.19
2030_Top handler_Diesel	0.0040	0.63	8.30	2.26	0.08	0.07	0.07	7,369.83	0.09	-	0.08
2030_Top handler_Diesel	0.0040	1.42	19.29	5.27	0.18	0.17	0.17	17,209.48	0.21	-	0.18
2030_Top handler_Diesel	0.0040	6.05	69.65	18.74	0.66	0.61	0.59	60,232.82	0.75	-	0.66
2030_Top handler_Diesel	0.0040	3.01	18.83	4.95	0.20	0.18	0.14	14,521.31	0.31	-	0.20
2030_Top handler_Diesel	0.0040	0.54	6.20	1.70	0.06	0.06	0.05	5,461.73	0.07	-	0.06
2030_Truck_Diesel	0.0040	0.22	2.11	0.56	0.02	0.02	0.02	1,758.00	0.06	-	0.02
2030_Truck_Diesel	0.0040	0.41	3.23	0.83	0.03	0.03	0.03	2,537.51	0.09	-	0.03
2030_Truck_Diesel	0.0040	0.14	1.32	0.35	0.01	0.01	0.01	1,083.15	0.04	-	0.01
2030_Yard tractor_LNG	0.0040	10.21	77.30	19.71	0.76	0.70	-	47,261.93	2.30	-	-
2030_Yard tractor_LNG	0.0040	15.90	109.21	27.40	1.09	1.00	-	64,373.74	8.19	-	-
2030_Yard tractor_LNG	0.0040	15.23	96.65	23.89	0.98	0.90	-	55,084.44	6.52	-	-
2030_Yard tractor_LNG	0.0040	4.27	34.29	8.82	0.34	0.31	-	21,388.78	1.97	-	-

8hr/24hr Peaking Factor*: 0.529716683
**Note: Using same peaking factor that is applied to trucks*

Table B1-17. 2030 FEIR Mitigated Scenario Eight Hour Peak Emissions

2030	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Diesel	0.00	0.13	0.12	0.00	0.00	0.00	37.39	0.00	0.00	0.00
2030_Forklift_Diesel	0.01	0.49	0.05	0.00	0.00	0.00	151.99	0.00	0.00	0.00
2030_Forklift_Diesel	0.07	2.66	0.25	0.01	0.01	0.01	804.63	0.01	0.00	0.01
2030_Forklift_Diesel	0.02	1.08	0.10	0.00	0.00	0.00	333.59	0.00	0.00	0.00
2030_Forklift_Diesel	0.02	0.99	0.09	0.00	0.00	0.00	308.50	0.00	0.00	0.00
2030_Forklift_Diesel	0.01	0.26	0.02	0.00	0.00	0.00	80.64	0.00	0.00	0.00
2030_Forklift_Diesel	0.01	0.35	0.03	0.00	0.00	0.00	111.34	0.00	0.00	0.00
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Top handler_Diesel	0.80	10.70	2.92	0.10	0.09	0.11	9522.25	0.12	0.00	0.10
2030_Top handler_Diesel	0.33	4.40	1.20	0.04	0.04	0.04	3903.92	0.05	0.00	0.04
2030_Top handler_Diesel	0.75	10.22	2.79	0.10	0.09	0.09	9116.15	0.11	0.00	0.10
2030_Top handler_Diesel	3.21	36.89	9.93	0.35	0.32	0.31	31906.33	0.40	0.00	0.35
2030_Top handler_Diesel	1.59	9.97	2.62	0.11	0.10	0.08	7692.18	0.16	0.00	0.11
2030_Top handler_Diesel	0.29	3.28	0.90	0.03	0.03	0.03	2893.17	0.04	0.00	0.03
2030_Truck_Diesel	0.12	1.12	0.30	0.01	0.01	0.01	931.24	0.03	0.00	0.01
2030_Truck_Diesel	0.22	1.71	0.44	0.02	0.02	0.02	1344.16	0.05	0.00	0.02
2030_Truck_Diesel	0.08	0.70	0.18	0.01	0.01	0.01	573.76	0.02	0.00	0.01
2030_Yard tractor_LNG	5.41	40.95	10.44	0.40	0.37	0.00	25035.43	1.22	0.00	-
2030_Yard tractor_LNG	8.42	57.85	14.51	0.58	0.53	0.00	34099.84	4.34	0.00	-
2030_Yard tractor_LNG	8.07	51.20	12.65	0.52	0.48	0.00	29179.15	3.46	0.00	-
2030_Yard tractor_LNG	2.26	18.16	4.67	0.18	0.16	0.00	11329.99	1.04	0.00	-

1hr/24hr Peaking Factor*: 0.073685169
**Note: Using same peaking factor that is applied to trucks*

Table B1-18. 2030 FEIR Mitigated Scenario One Hour Peak Emissions

2030	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	5.20	0.00	0.00	0.00
2030_Forklift_Diesel	0.00	0.07	0.01	0.00	0.00	0.00	21.14	0.00	0.00	0.00
2030_Forklift_Diesel	0.01	0.37	0.03	0.00	0.00	0.00	111.93	0.00	0.00	0.00
2030_Forklift_Diesel	0.00	0.15	0.01	0.00	0.00	0.00	46.40	0.00	0.00	0.00
2030_Forklift_Diesel	0.00	0.14	0.01	0.00	0.00	0.00	42.91	0.00	0.00	0.00
2030_Forklift_Diesel	0.00	0.04	0.00	0.00	0.00	0.00	11.22	0.00	0.00	0.00
2030_Forklift_Diesel	0.00	0.05	0.00	0.00	0.00	0.00	15.49	0.00	0.00	0.00
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Top handler_Diesel	0.11	1.49	0.41	0.01	0.01	0.01	1324.57	0.02	0.00	0.01
2030_Top handler_Diesel	0.05	0.61	0.17	0.01	0.01	0.01	543.05	0.01	0.00	0.01
2030_Top handler_Diesel	0.10	1.42	0.39	0.01	0.01	0.01	1268.08	0.02	0.00	0.01
2030_Top handler_Diesel	0.45	5.13	1.38	0.05	0.04	0.04	4438.27	0.06	0.00	0.05
2030_Top handler_Diesel	0.22	1.39	0.36	0.01	0.01	0.01	1070.01	0.02	0.00	0.01
2030_Top handler_Diesel	0.04	0.46	0.13	0.00	0.00	0.00	402.45	0.01	0.00	0.00
2030_Truck_Diesel	0.02	0.16	0.04	0.00	0.00	0.00	129.54	0.00	0.00	0.00
2030_Truck_Diesel	0.03	0.24	0.06	0.00	0.00	0.00	186.98	0.01	0.00	0.00
2030_Truck_Diesel	0.01	0.10	0.03	0.00	0.00	0.00	79.81	0.00	0.00	0.00
2030_Yard tractor_LNG	0.75	5.70	1.45	0.06	0.05	0.00	3482.50	0.17	0.00	-
2030_Yard tractor_LNG	1.17	8.05	2.02	0.08	0.07	0.00	4743.39	0.60	0.00	-
2030_Yard tractor_LNG	1.12	7.12	1.76	0.07	0.07	0.00	4058.91	0.48	0.00	-
2030_Yard tractor_LNG	0.31	2.53	0.65	0.02	0.02	0.00	1576.04	0.15	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2036

Table B1-19. 2036 FEIR Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0	N/A	0%	-
Forklift	75	2030	Diesel	0.3	1	N/A	0%	412
Forklift	137	2030	Diesel	0.3	1	N/A	0%	917
Forklift	152	2030	Diesel	0.3	2	N/A	0%	4,377
Forklift	152	2030	Diesel	0.3	2	N/A	0%	1,815
Forklift	160	2030	Diesel	0.3	2	N/A	0%	1,594
Forklift	160	2030	Diesel	0.3	2	N/A	0%	417
Forklift	165	2030	Diesel	0.3	2	N/A	0%	558
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	197	0	Electric	0.2	5	N/A	0%	16,040
Sweeper	100	2030	Diesel	0.68	0	N/A	0%	-
Top handler	250	2030	Diesel	0.59	8	N/A	0%	16,014
Top handler	260	2030	Diesel	0.59	3	N/A	0%	6,318
Top handler	260	2030	Diesel	0.59	8	N/A	0%	14,753
Top handler	260	2030	Diesel	0.59	15	N/A	0%	51,633
Top handler	335	2027	Diesel	0.59	3	N/A	0%	9,678
Top handler	370	2030	Diesel	0.59	1	N/A	0%	3,290
Truck	250	2026	Diesel	0.51	2	N/A	0%	1,812
Truck	250	2026	Diesel	0.51	2	N/A	0%	2,615
Truck	275	2026	Diesel	0.51	1	N/A	0%	1,015
Yard tractor	195	2026	LNG	0.39	53	N/A	0%	103,154
Yard tractor	195	2026	LNG	0.39	59	N/A	0%	140,503
Yard tractor	195	2026	LNG	0.39	43	N/A	0%	120,228
Yard tractor	231	2026	LNG	0.39	23	N/A	0%	39,408

Table B1-20. 2036 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2036_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Forklift_Diesel	0.164	3.232	2.821	0.010	0.009	0.010	852.428	0.045	-
2036_Forklift_Diesel	0.114	3.056	0.273	0.011	0.010	0.010	852.455	0.031	-
2036_Forklift_Diesel	0.199	3.550	0.296	0.013	0.012	0.010	852.455	0.031	-
2036_Forklift_Diesel	0.113	3.053	0.273	0.010	0.010	0.010	852.455	0.031	-
2036_Forklift_Diesel	0.106	3.010	0.271	0.010	0.009	0.010	852.455	0.031	-
2036_Forklift_Diesel	0.067	2.781	0.260	0.009	0.008	0.010	852.455	0.031	-
2036_Forklift_Diesel	0.071	2.808	0.261	0.009	0.008	0.010	852.455	0.031	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.470	0.036	-
2036_Top handler_Diesel	0.187	1.185	0.293	0.012	0.011	0.010	852.009	0.026	-
2036_Top handler_Diesel	0.194	1.198	0.295	0.012	0.011	0.008	853.415	0.026	-
2036_Top handler_Diesel	0.176	1.164	0.290	0.012	0.011	0.008	853.415	0.026	-
2036_Top handler_Diesel	0.283	1.375	0.319	0.014	0.013	0.008	853.415	0.026	-
2036_Top handler_Diesel	0.362	1.376	0.341	0.016	0.015	0.008	852.783	0.031	-
2036_Top handler_Diesel	0.273	1.246	0.316	0.014	0.013	0.008	853.415	0.026	-
2036_Truck_Diesel	0.169	1.149	0.288	0.011	0.011	0.010	852.423	0.031	-
2036_Truck_Diesel	0.239	1.287	0.307	0.013	0.012	0.010	852.423	0.031	-
2036_Truck_Diesel	0.183	1.177	0.292	0.012	0.011	0.008	852.513	0.031	-
2036_Yard tractor_LNG	0.258	1.324	0.312	0.014	0.013	-	674.859	0.068	-
2036_Yard tractor_LNG	0.304	1.415	0.325	0.015	0.014	-	674.859	0.050	-
2036_Yard tractor_LNG	0.347	1.501	0.337	0.016	0.015	-	674.859	0.045	-
2036_Yard tractor_LNG	0.233	1.276	0.305	0.013	0.012	-	674.859	0.027	-

Table B1-21. 2036 FEIR Mitigated Scenario Annual Mass Emissions

2036		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2036_Forklift_Diesel	9,277	0.00	0.03	0.03	0.00	0.00	0.00	8.72	0.00	-	0.00
2036_Forklift_Diesel	37,704	0.00	0.13	0.01	0.00	0.00	0.00	35.43	0.00	-	0.00
2036_Forklift_Diesel	199,607	0.04	0.78	0.07	0.00	0.00	0.00	187.56	0.01	-	0.00
2036_Forklift_Diesel	82,755	0.01	0.28	0.02	0.00	0.00	0.00	77.76	0.00	-	0.00
2036_Forklift_Diesel	76,530	0.01	0.25	0.02	0.00	0.00	0.00	71.91	0.00	-	0.00
2036_Forklift_Diesel	20,005	0.00	0.06	0.01	0.00	0.00	0.00	18.80	0.00	-	0.00
2036_Forklift_Diesel	27,622	0.00	0.09	0.01	0.00	0.00	0.00	25.95	0.00	-	0.00
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	631,983	-	-	-	-	-	-	-	-	-	-
2036_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2036_Top handler_Diesel	2,362,055	0.49	3.08	0.76	0.03	0.03	0.02	2,218.36	0.07	-	0.03
2036_Top handler_Diesel	969,128	0.21	1.28	0.31	0.01	0.01	0.01	911.67	0.03	-	0.01
2036_Top handler_Diesel	2,263,034	0.44	2.90	0.72	0.03	0.03	0.02	2,128.86	0.06	-	0.03
2036_Top handler_Diesel	7,920,571	2.47	12.01	2.79	0.13	0.12	0.07	7,450.98	0.22	-	0.13
2036_Top handler_Diesel	1,912,931	0.76	2.90	0.72	0.03	0.03	0.02	1,798.19	0.07	-	0.03
2036_Top handler_Diesel	718,214	0.22	0.99	0.25	0.01	0.01	0.01	675.63	0.02	-	0.01
2036_Truck_Diesel	231,021	0.04	0.29	0.07	0.00	0.00	0.00	217.07	0.01	-	0.00
2036_Truck_Diesel	333,457	0.09	0.47	0.11	0.00	0.00	0.00	313.32	0.01	-	0.00
2036_Truck_Diesel	142,332	0.03	0.18	0.05	0.00	0.00	0.00	133.75	0.00	-	0.00
2036_Yard tractor_LNG	7,844,878	2.23	11.45	2.70	0.12	0.11	-	5,835.75	0.59	-	-
2036_Yard tractor_LNG	10,685,221	3.58	16.66	3.82	0.18	0.16	-	7,948.66	0.59	-	-
2036_Yard tractor_LNG	9,143,315	3.50	15.13	3.39	0.16	0.15	-	6,801.65	0.45	-	-
2036_Yard tractor_LNG	3,550,265	0.91	4.99	1.20	0.05	0.05	-	2,641.02	0.11	-	-

Table B1-22. 2036 FEIR Mitigated Scenario Peak Day Emissions

2036		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Diesel	0.0040	0.01	0.27	0.23	0.00	0.00	0.00	71	0.00	-	0.00
2036_Forklift_Diesel	0.0040	0.04	1.03	0.09	0.00	0.00	0.00	287	0.01	-	0.00
2036_Forklift_Diesel	0.0040	0.36	6.33	0.53	0.02	0.02	0.02	1,519	0.06	-	0.02
2036_Forklift_Diesel	0.0040	0.08	2.26	0.20	0.01	0.01	0.01	630	0.02	-	0.01
2036_Forklift_Diesel	0.0040	0.07	2.06	0.18	0.01	0.01	0.01	582	0.02	-	0.01
2036_Forklift_Diesel	0.0040	0.01	0	0.05	0.00	0.00	0.00	152	0.01	-	0.00
2036_Forklift_Diesel	0.0040	0.02	0.69	0.06	0.00	0.00	0.00	210.20	0.01	-	0.00
2036_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Top handler_Diesel	0.0040	3.94	24.98	6.17	0.25	0.23	0.20	17,965.79	0.54	-	0.25
2036_Top handler_Diesel	0.0040	1.68	10.37	2.55	0.10	0.10	0.07	7,383.34	0.22	-	0.10
2036_Top handler_Diesel	0.0040	3.56	23.51	5.86	0.24	0.22	0.17	17,241.02	0.52	-	0.24
2036_Top handler_Diesel	0.0040	20.04	97.24	22.57	1.02	0.94	0.59	60,343.22	1.82	-	1.02
2036_Top handler_Diesel	0.0040	6.18	23.51	5.82	0.28	0.26	0.14	14,562.96	0.53	-	0.28
2036_Top handler_Diesel	0.0040	1.75	7.99	2.03	0.09	0.08	0.05	5,471.74	0.17	-	0.09
2036_Truck_Diesel	0.0040	0.35	2.37	0.59	0.02	0.02	0.02	1,758.00	0.06	-	0.02
2036_Truck_Diesel	0.0040	0.71	3.83	0.91	0.04	0.04	0.03	2,537.51	0.09	-	0.04
2036_Truck_Diesel	0.0040	0.23	1.50	0.37	0.02	0.01	0.01	1,083.22	0.04	-	0.02
2036_Yard tractor_LNG	0.0040	18.05	92.75	21.86	0.96	0.89	-	47,261.93	4.77	-	-
2036_Yard tractor_LNG	0.0040	28.95	134.96	30.97	1.43	1.31	-	64,373.74	4.81	-	-
2036_Yard tractor_LNG	0.0040	28.34	122.52	27.48	1.31	1.21	-	55,084.44	3.64	-	-
2036_Yard tractor_LNG	0.0040	7.39	40.44	9.68	0.42	0.38	-	21,388.78	0.85	-	-

8hr/24hr Peaking Factor*: 0.529716683
**Note: Using same peaking factor that is applied to trucks*

Table B1-23. 2036 FEIR Mitigated Scenario Eight Hour Peak Emissions

2036	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Diesel	0.01	0.14	0.12	0.00	0.00	0.00	37.39	0.00	0.00	0.00
2036_Forklift_Diesel	0.02	0.54	0.05	0.00	0.00	0.00	151.99	0.01	0.00	0.00
2036_Forklift_Diesel	0.19	3.35	0.28	0.01	0.01	0.01	804.64	0.03	0.00	0.01
2036_Forklift_Diesel	0.04	1.19	0.11	0.00	0.00	0.00	333.60	0.01	0.00	0.00
2036_Forklift_Diesel	0.04	1.09	0.10	0.00	0.00	0.00	308.50	0.01	0.00	0.00
2036_Forklift_Diesel	0.01	0.26	0.02	0.00	0.00	0.00	80.64	0.00	0.00	0.00
2036_Forklift_Diesel	0.01	0.37	0.03	0.00	0.00	0.00	111.35	0.00	0.00	0.00
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Top handler_Diesel	2.09	13.23	3.27	0.13	0.12	0.11	9516.78	0.29	0.00	0.13
2036_Top handler_Diesel	0.89	5.49	1.35	0.06	0.05	0.04	3911.08	0.12	0.00	0.06
2036_Top handler_Diesel	1.89	12.46	3.10	0.13	0.12	0.09	9132.86	0.28	0.00	0.13
2036_Top handler_Diesel	10.62	51.51	11.95	0.54	0.50	0.31	31964.81	0.96	0.00	0.54
2036_Top handler_Diesel	3.27	12.45	3.08	0.15	0.14	0.08	7714.24	0.28	0.00	0.15
2036_Top handler_Diesel	0.93	4.23	1.07	0.05	0.04	0.03	2898.47	0.09	0.00	0.05
2036_Truck_Diesel	0.18	1.26	0.31	0.01	0.01	0.01	931.24	0.03	0.00	0.01
2036_Truck_Diesel	0.38	2.03	0.48	0.02	0.02	0.02	1344.16	0.05	0.00	0.02
2036_Truck_Diesel	0.12	0.79	0.20	0.01	0.01	0.01	573.80	0.02	0.00	0.01
2036_Yard tractor_LNG	9.56	49.13	11.58	0.51	0.47	0.00	25035.43	2.53	0.00	-
2036_Yard tractor_LNG	15.34	71.49	16.41	0.75	0.69	0.00	34099.84	2.55	0.00	-
2036_Yard tractor_LNG	15.01	64.90	14.56	0.69	0.64	0.00	29179.15	1.93	0.00	-
2036_Yard tractor_LNG	3.91	21.42	5.13	0.22	0.20	0.00	11329.99	0.45	0.00	-

1hr/24hr Peaking Factor*: 0.073685169

**Note: Using same peaking factor that is applied to trucks*

Table B1-24. 2036 FEIR Mitigated Scenario One Hour Peak Emissions

2036	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	5.20	0.00	0.00	0.00
2036_Forklift_Diesel	0.00	0.08	0.01	0.00	0.00	0.00	21.14	0.00	0.00	0.00
2036_Forklift_Diesel	0.03	0.47	0.04	0.00	0.00	0.00	111.93	0.00	0.00	0.00
2036_Forklift_Diesel	0.01	0.17	0.01	0.00	0.00	0.00	46.40	0.00	0.00	0.00
2036_Forklift_Diesel	0.01	0.15	0.01	0.00	0.00	0.00	42.91	0.00	0.00	0.00
2036_Forklift_Diesel	0.00	0.04	0.00	0.00	0.00	0.00	11.22	0.00	0.00	0.00
2036_Forklift_Diesel	0.00	0.05	0.00	0.00	0.00	0.00	15.49	0.00	0.00	0.00
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Top handler_Diesel	0.29	1.84	0.45	0.02	0.02	0.01	1323.81	0.04	0.00	0.02
2036_Top handler_Diesel	0.12	0.76	0.19	0.01	0.01	0.01	544.04	0.02	0.00	0.01
2036_Top handler_Diesel	0.26	1.73	0.43	0.02	0.02	0.01	1270.41	0.04	0.00	0.02
2036_Top handler_Diesel	1.48	7.16	1.66	0.08	0.07	0.04	4446.40	0.13	0.00	0.08
2036_Top handler_Diesel	0.46	1.73	0.43	0.02	0.02	0.01	1073.07	0.04	0.00	0.02
2036_Top handler_Diesel	0.13	0.59	0.15	0.01	0.01	0.00	403.19	0.01	0.00	0.01
2036_Truck_Diesel	0.03	0.17	0.04	0.00	0.00	0.00	129.54	0.00	0.00	0.00
2036_Truck_Diesel	0.05	0.28	0.07	0.00	0.00	0.00	186.98	0.01	0.00	0.00
2036_Truck_Diesel	0.02	0.11	0.03	0.00	0.00	0.00	79.82	0.00	0.00	0.00
2036_Yard tractor_LNG	1.33	6.83	1.61	0.07	0.07	0.00	3482.50	0.35	0.00	-
2036_Yard tractor_LNG	2.13	9.94	2.28	0.11	0.10	0.00	4743.39	0.35	0.00	-
2036_Yard tractor_LNG	2.09	9.03	2.02	0.10	0.09	0.00	4058.91	0.27	0.00	-
2036_Yard tractor_LNG	0.54	2.98	0.71	0.03	0.03	0.00	1576.04	0.06	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2045

Table B1-25. 2045 FEIR Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0	N/A	0%	-
Forklift	75	2030	Diesel	0.3	1	N/A	0%	412
Forklift	137	2030	Diesel	0.3	1	N/A	0%	917
Forklift	152	2030	Diesel	0.3	2	N/A	0%	4,377
Forklift	152	2030	Diesel	0.3	2	N/A	0%	1,815
Forklift	160	2030	Diesel	0.3	2	N/A	0%	1,594
Forklift	160	2030	Diesel	0.3	2	N/A	0%	417
Forklift	165	2030	Diesel	0.3	2	N/A	0%	558
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	0	0	Electric	0.2	0	N/A	0%	-
Rub-trd Gantry Crane	197	0	Electric	0.2	5	N/A	0%	16,040
Sweeper	100	2030	Diesel	0.68	0	N/A	0%	-
Top handler	250	2030	Diesel	0.59	8	N/A	0%	16,014
Top handler	260	2030	Diesel	0.59	3	N/A	0%	6,318
Top handler	260	2030	Diesel	0.59	8	N/A	0%	14,753
Top handler	260	2030	Diesel	0.59	15	N/A	0%	51,633
Top handler	335	2043	Diesel	0.59	3	N/A	0%	9,678
Top handler	370	2030	Diesel	0.59	1	N/A	0%	3,290
Truck	250	2038	Diesel	0.51	2	N/A	0%	1,812
Truck	250	2038	Diesel	0.51	2	N/A	0%	2,615
Truck	275	2038	Diesel	0.51	1	N/A	0%	1,015
Yard tractor	195	2038	LNG	0.39	53	N/A	0%	103,154
Yard tractor	195	2038	LNG	0.39	59	N/A	0%	140,503
Yard tractor	195	2038	LNG	0.39	43	N/A	0%	120,228
Yard tractor	231	2038	LNG	0.39	23	N/A	0%	39,408

Table B1-26. 2045 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2045_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Forklift_Diesel	0.240	3.465	2.924	0.013	0.012	0.010	852.459	0.045	-
2045_Forklift_Diesel	0.193	3.515	0.294	0.013	0.012	0.010	852.467	0.031	-
2045_Forklift_Diesel	0.388	4.644	0.348	0.019	0.018	0.010	852.467	0.031	-
2045_Forklift_Diesel	0.192	3.506	0.294	0.013	0.012	0.010	852.467	0.031	-
2045_Forklift_Diesel	0.175	3.408	0.289	0.012	0.011	0.010	852.467	0.031	-
2045_Forklift_Diesel	0.085	2.885	0.265	0.010	0.009	0.010	852.467	0.031	-
2045_Forklift_Diesel	0.095	2.948	0.268	0.010	0.009	0.010	852.467	0.031	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.430	0.045	-
2045_Top handler_Diesel	0.359	1.525	0.340	0.016	0.015	0.010	852.408	0.031	-
2045_Top handler_Diesel	0.375	1.557	0.344	0.017	0.015	0.008	851.444	0.031	-
2045_Top handler_Diesel	0.335	1.477	0.333	0.016	0.014	0.008	851.444	0.031	-
2045_Top handler_Diesel	0.580	1.960	0.400	0.022	0.020	0.008	851.444	0.031	-
2045_Top handler_Diesel	0.145	1.057	0.281	0.011	0.010	0.008	852.777	0.011	-
2045_Top handler_Diesel	0.557	1.665	0.394	0.021	0.020	0.008	851.444	0.031	-
2045_Truck_Diesel	0.137	1.087	0.279	0.011	0.010	0.010	852.488	0.023	-
2045_Truck_Diesel	0.188	1.187	0.293	0.012	0.011	0.010	852.488	0.023	-
2045_Truck_Diesel	0.147	1.107	0.282	0.011	0.010	0.008	852.458	0.023	-
2045_Yard tractor_LNG	0.202	1.214	0.297	0.012	0.011	-	674.859	0.021	-
2045_Yard tractor_LNG	0.235	1.280	0.306	0.013	0.012	-	674.859	0.021	-
2045_Yard tractor_LNG	0.267	1.343	0.315	0.014	0.013	-	674.859	0.021	-
2045_Yard tractor_LNG	0.184	1.179	0.292	0.012	0.011	-	674.859	0.050	-

Table B1-27. 2045 FEIR Mitigated Scenario Annual Mass Emissions

2045		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2045_Forklift_Diesel	9,277	0.00	0.04	0.03	0.00	0.00	0.00	8.72	0.00	-	0.00
2045_Forklift_Diesel	37,704	0.01	0.15	0.01	0.00	0.00	0.00	35.43	0.00	-	0.00
2045_Forklift_Diesel	199,607	0.09	1.02	0.08	0.00	0.00	0.00	187.56	0.01	-	0.00
2045_Forklift_Diesel	82,755	0.02	0.32	0.03	0.00	0.00	0.00	77.76	0.00	-	0.00
2045_Forklift_Diesel	76,530	0.01	0.29	0.02	0.00	0.00	0.00	71.91	0.00	-	0.00
2045_Forklift_Diesel	20,005	0.00	0.06	0.01	0.00	0.00	0.00	18.80	0.00	-	0.00
2045_Forklift_Diesel	27,622	0.00	0.09	0.01	0.00	0.00	0.00	25.96	0.00	-	0.00
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	631,983	-	-	-	-	-	-	-	-	-	-
2045_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2045_Top handler_Diesel	2,362,055	0.94	3.97	0.89	0.04	0.04	0.02	2,219.40	0.08	-	0.04
2045_Top handler_Diesel	969,128	0.40	1.66	0.37	0.02	0.02	0.01	909.57	0.03	-	0.02
2045_Top handler_Diesel	2,263,034	0.84	3.69	0.83	0.04	0.04	0.02	2,123.95	0.08	-	0.04
2045_Top handler_Diesel	7,920,571	5.07	17.12	3.50	0.19	0.18	0.07	7,433.78	0.27	-	0.19
2045_Top handler_Diesel	1,912,931	0.31	2.23	0.59	0.02	0.02	0.02	1,798.18	0.02	-	0.02
2045_Top handler_Diesel	718,214	0.44	1.32	0.31	0.02	0.02	0.01	674.07	0.02	-	0.02
2045_Truck_Diesel	231,021	0.03	0.28	0.07	0.00	0.00	0.00	217.09	0.01	-	0.00
2045_Truck_Diesel	333,457	0.07	0.44	0.11	0.00	0.00	0.00	313.35	0.01	-	0.00
2045_Truck_Diesel	142,332	0.02	0.17	0.04	0.00	0.00	0.00	133.74	0.00	-	0.00
2045_Yard tractor_LNG	7,844,878	1.74	10.50	2.57	0.11	0.10	-	5,835.75	0.18	-	-
2045_Yard tractor_LNG	10,685,221	2.77	15.07	3.60	0.16	0.14	-	7,948.66	0.25	-	-
2045_Yard tractor_LNG	9,143,315	2.69	13.53	3.17	0.14	0.13	-	6,801.65	0.21	-	-
2045_Yard tractor_LNG	3,550,265	0.72	4.61	1.14	0.05	0.04	-	2,641.02	0.20	-	-

Table B1-28. 2045 FEIR Mitigated Scenario Peak Day Emissions

2045		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Diesel	0.0040	0.02	0.29	0.24	0.00	0.00	0.00	71	0.00	-	0.00
2045_Forklift_Diesel	0.0040	0.07	1.18	0.10	0.00	0.00	0.00	287	0.01	-	0.00
2045_Forklift_Diesel	0.0040	0.69	8.27	0.62	0.03	0.03	0.02	1,519	0.06	-	0.03
2045_Forklift_Diesel	0.0040	0.14	2.59	0.22	0.01	0.01	0.01	630	0.02	-	0.01
2045_Forklift_Diesel	0.0040	0.12	2.33	0.20	0.01	0.01	0.01	582	0.02	-	0.01
2045_Forklift_Diesel	0.0040	0.02	1	0.05	0.00	0.00	0.00	152	0.01	-	0.00
2045_Forklift_Diesel	0.0040	0.02	0.73	0.07	0.00	0.00	0.00	210.20	0.01	-	0.00
2045_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Top handler_Diesel	0.0040	7.58	32.16	7.17	0.35	0.32	0.20	17,974.21	0.65	-	0.35
2045_Top handler_Diesel	0.0040	3.25	13.47	2.98	0.15	0.13	0.07	7,366.30	0.27	-	0.15
2045_Top handler_Diesel	0.0040	6.77	29.85	6.73	0.32	0.29	0.17	17,201.22	0.63	-	0.32
2045_Top handler_Diesel	0.0040	41.02	138.62	28.32	1.56	1.43	0.59	60,203.92	2.19	-	1.56
2045_Top handler_Diesel	0.0040	2.48	18.05	4.80	0.19	0.17	0.14	14,562.87	0.18	-	0.19
2045_Top handler_Diesel	0.0040	3.57	10.67	2.53	0.14	0.13	0.05	5,459.11	0.20	-	0.14
2045_Truck_Diesel	0.0040	0.28	2.24	0.58	0.02	0.02	0.02	1,758.13	0.05	-	0.02
2045_Truck_Diesel	0.0040	0.56	3.53	0.87	0.04	0.03	0.03	2,537.70	0.07	-	0.04
2045_Truck_Diesel	0.0040	0.19	1.41	0.36	0.01	0.01	0.01	1,083.15	0.03	-	0.01
2045_Yard tractor_LNG	0.0040	14.13	85.03	20.79	0.86	0.79	-	47,261.93	1.47	-	-
2045_Yard tractor_LNG	0.0040	22.43	122.09	29.18	1.26	1.16	-	64,373.74	2.00	-	-
2045_Yard tractor_LNG	0.0040	21.78	109.58	25.68	1.14	1.05	-	55,084.44	1.71	-	-
2045_Yard tractor_LNG	0.0040	5.83	37.36	9.25	0.38	0.35	-	21,388.78	1.60	-	-

8hr/24hr Peaking Factor*: 0.529716683
**Note: Using same peaking factor that is applied to trucks*

Table B1-29. 2045 FEIR Mitigated Scenario Eight Hour Peak Emissions

2045	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Diesel	0.01	0.15	0.13	0.00	0.00	0.00	37.40	0.00	0.00	0.00
2045_Forklift_Diesel	0.03	0.63	0.05	0.00	0.00	0.00	151.99	0.01	0.00	0.00
2045_Forklift_Diesel	0.37	4.38	0.33	0.02	0.02	0.01	804.65	0.03	0.00	0.02
2045_Forklift_Diesel	0.08	1.37	0.12	0.01	0.00	0.00	333.60	0.01	0.00	0.01
2045_Forklift_Diesel	0.06	1.23	0.10	0.00	0.00	0.00	308.51	0.01	0.00	0.00
2045_Forklift_Diesel	0.01	0.27	0.03	0.00	0.00	0.00	80.64	0.00	0.00	0.00
2045_Forklift_Diesel	0.01	0.39	0.03	0.00	0.00	0.00	111.35	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Top handler_Diesel	4.01	17.03	3.80	0.18	0.17	0.11	9521.24	0.35	0.00	0.18
2045_Top handler_Diesel	1.72	7.13	1.58	0.08	0.07	0.04	3902.05	0.14	0.00	0.08
2045_Top handler_Diesel	3.59	15.81	3.57	0.17	0.16	0.09	9111.77	0.33	0.00	0.17
2045_Top handler_Diesel	21.73	73.43	15.00	0.82	0.76	0.31	31891.02	1.16	0.00	0.82
2045_Top handler_Diesel	1.31	9.56	2.55	0.10	0.09	0.08	7714.20	0.10	0.00	0.10
2045_Top handler_Diesel	1.89	5.65	1.34	0.07	0.07	0.03	2891.78	0.11	0.00	0.07
2045_Truck_Diesel	0.15	1.19	0.30	0.01	0.01	0.01	931.31	0.03	0.00	0.01
2045_Truck_Diesel	0.30	1.87	0.46	0.02	0.02	0.02	1344.26	0.04	0.00	0.02
2045_Truck_Diesel	0.10	0.74	0.19	0.01	0.01	0.01	573.76	0.02	0.00	0.01
2045_Yard tractor_LNG	7.49	45.04	11.01	0.46	0.42	0.00	25035.43	0.78	0.00	-
2045_Yard tractor_LNG	11.88	64.67	15.46	0.67	0.61	0.00	34099.84	1.06	0.00	-
2045_Yard tractor_LNG	11.54	58.05	13.60	0.61	0.56	0.00	29179.15	0.91	0.00	-
2045_Yard tractor_LNG	3.09	19.79	4.90	0.20	0.18	0.00	11329.99	0.85	0.00	-

1hr/24hr Peaking Factor*: 0.073685169

**Note: Using same peaking factor that is applied to trucks*

Table B1-30. 2045 FEIR Mitigated Scenario One Hour Peak Emissions

2045	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	5.20	0.00	0.00	0.00
2045_Forklift_Diesel	0.00	0.09	0.01	0.00	0.00	0.00	21.14	0.00	0.00	0.00
2045_Forklift_Diesel	0.05	0.61	0.05	0.00	0.00	0.00	111.93	0.00	0.00	0.00
2045_Forklift_Diesel	0.01	0.19	0.02	0.00	0.00	0.00	46.41	0.00	0.00	0.00
2045_Forklift_Diesel	0.01	0.17	0.01	0.00	0.00	0.00	42.91	0.00	0.00	0.00
2045_Forklift_Diesel	0.00	0.04	0.00	0.00	0.00	0.00	11.22	0.00	0.00	0.00
2045_Forklift_Diesel	0.00	0.05	0.00	0.00	0.00	0.00	15.49	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Top handler_Diesel	0.56	2.37	0.53	0.03	0.02	0.01	1324.43	0.05	0.00	0.03
2045_Top handler_Diesel	0.24	0.99	0.22	0.01	0.01	0.01	542.79	0.02	0.00	0.01
2045_Top handler_Diesel	0.50	2.20	0.50	0.02	0.02	0.01	1267.47	0.05	0.00	0.02
2045_Top handler_Diesel	3.02	10.21	2.09	0.11	0.11	0.04	4436.14	0.16	0.00	0.11
2045_Top handler_Diesel	0.18	1.33	0.35	0.01	0.01	0.01	1073.07	0.01	0.00	0.01
2045_Top handler_Diesel	0.26	0.79	0.19	0.01	0.01	0.00	402.26	0.01	0.00	0.01
2045_Truck_Diesel	0.02	0.17	0.04	0.00	0.00	0.00	129.55	0.00	0.00	0.00
2045_Truck_Diesel	0.04	0.26	0.06	0.00	0.00	0.00	186.99	0.01	0.00	0.00
2045_Truck_Diesel	0.01	0.10	0.03	0.00	0.00	0.00	79.81	0.00	0.00	0.00
2045_Yard tractor_LNG	1.04	6.27	1.53	0.06	0.06	0.00	3482.50	0.11	0.00	-
2045_Yard tractor_LNG	1.65	9.00	2.15	0.09	0.09	0.00	4743.39	0.15	0.00	-
2045_Yard tractor_LNG	1.61	8.07	1.89	0.08	0.08	0.00	4058.91	0.13	0.00	-
2045_Yard tractor_LNG	0.43	2.75	0.68	0.03	0.03	0.00	1576.04	0.12	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2014

Table B1-31. 2014 Unmitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS	Emission Controls (% reduction) PM	HC	CO
Electric Wharf Crane	NA	1997	Electric	na	16		0%	-	0%	0%	0%
Forklift	137	2007	D	0.3	3	DPF	67%	785	85%	93%	90%
Forklift	152	1994	D	0.3	1		0%	-	0%	0%	0%
Forklift	152	2004	D	0.3	2	DPF	50%	1,109	85%	93%	90%
Forklift	152	2005	D	0.3	3	DPF	67%	896	85%	93%	90%
Forklift	164	2009	D	0.3	1	DPF	100%	72	85%	93%	90%
Forklift	165	2014	D	0.3	1		0%	43	0%	0%	0%
Forklift	190	2004	D	0.3	2	DPF	50%	1,022	85%	93%	90%
Forklift	75	2011	LPG	0.3	1		0%	55	0%	0%	0%
Forklift	160	2005	LPG	0.3	3		0%	597	0%	0%	0%
Forklift	160	2008	LPG	0.3	2		0%	232	0%	0%	0%
Forklift	165	1995	LPG	0.3	1		0%	1	0%	0%	0%
Forklift	165	2002	LPG	0.3	2		0%	627	0%	0%	0%
Rub-trd Gantry Crane	197	2011	D	0.2	1		0%	1,636	0%	0%	0%
Rub-trd Gantry Crane	454	2004	D	0.2	2	Rypos,ULSD	100%	2,701	50%	78%	98%
Rub-trd Gantry Crane	600	2013	D	0.2	1		0%	1,629	0%	0%	0%
Rub-trd Gantry Crane	612	2003	D	0.2	8	Rypos,ULSD	100%	15,784	50%	78%	98%
Rub-trd Gantry Crane	685	1999	D	0.2	1	Rypos,ULSD	100%	1,306	50%	78%	98%
Rub-trd Gantry Crane	685	2005	D	0.2	5	Rypos,ULSD	100%	10,707	50%	78%	98%
Sweeper	100	1995	D	0.68	1		0%	-	0%	0%	0%
Top handler	250	2002	D	0.59	8	DPF	100%	11,823	85%	93%	90%
Top handler	260	2006	D	0.59	6	DPF	100%	9,613	85%	93%	90%
Top handler	260	2007	D	0.59	6	DPF	100%	8,789	85%	93%	90%
Top handler	260	2008	D	0.59	15	DPF	100%	32,431	85%	93%	90%
Top handler	335	2011	D	0.59	3		0%	4,262	0%	0%	0%
Top handler	370	2014	D	0.59	1		0%	971	0%	0%	0%
Truck	250	2005	D	0.51	2	DPF	100%	1,161	85%	93%	90%
Truck	250	2008	D	0.51	2		0%	1,676	0%	0%	0%
Truck	275	2001	D	0.51	1	DPF	100%	650	85%	93%	90%
Yard tractor	174	2000	LPG	0.39	2		0%	449	0%	0%	0%
Yard tractor	195	2004	LPG	0.39	53		0%	63,798	0%	0%	0%
Yard tractor	195	2007	LPG	0.39	59		0%	88,949	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	67,604	0%	0%	0%
Yard tractor	231	2011	LPG	0.39	23		0%	17,903	0%	0%	0%

Notes

NA: not available

Quantity is the total number of equipment at WBCT terminal which are used for China Shipping and Yang Ming operations.

Operating Hours are only for China Shipping operations calculated by applying ratio

of China Shipping throughput/total WBCT throughput to average annual hours for WBCT terminal

Data obtained: 3/2/2016

Emissions Control Data

http://rypos.com/wp-content/uploads/RTG-Technology-Information-Package-final.pdf

http://www.epa.gov/cleandiesel/verification/verif-list.htm

Table B1-32. 2014 Unmitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2014_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2014_Forklift_D	0.324	3.293	2.574	0.178	0.164	0.010	852.449	0.065	-
2014_Forklift_D	0.716	2.700	7.598	0.274	0.252	0.010	852.546	0.172	-
2014_Forklift_D	0.497	3.385	5.158	0.256	0.235	0.010	852.432	0.087	-
2014_Forklift_D	0.301	3.049	4.509	0.174	0.160	0.010	852.444	0.076	-
2014_Forklift_D	0.122	2.746	2.342	0.117	0.108	0.010	852.442	0.060	-
2014_Forklift_D	0.096	2.705	2.154	0.009	0.008	0.010	852.471	0.021	-
2014_Forklift_D	0.520	1.294	5.395	0.162	0.149	0.010	852.443	0.068	-
2014_Forklift_LPG	0.034	3.215	0.325	0.060	0.060	-	674.859	0.057	-
2014_Forklift_LPG	0.561	19.972	2.637	0.060	0.060	-	674.859	0.188	-
2014_Forklift_LPG	0.193	2.404	1.069	0.060	0.060	-	674.859	0.056	-
2014_Forklift_LPG	1.373	16.490	10.509	0.060	0.060	-	674.859	0.220	-
2014_Forklift_LPG	1.394	21.981	9.101	0.060	0.060	-	674.859	0.184	-
2014_Rub-trd Gantry Crane_D	0.260	1.155	1.451	0.012	0.011	0.010	852.537	0.029	-
2014_Rub-trd Gantry Crane_D	0.672	1.320	5.277	0.190	0.175	0.008	852.157	0.066	-
2014_Rub-trd Gantry Crane_D	0.166	1.008	1.370	0.010	0.009	0.009	850.134	0.020	-
2014_Rub-trd Gantry Crane_D	0.992	1.577	6.439	0.262	0.241	0.008	831.894	0.065	-
2014_Rub-trd Gantry Crane_D	0.701	1.481	8.966	0.316	0.291	0.009	856.602	0.074	-
2014_Rub-trd Gantry Crane_D	0.918	1.500	5.823	0.236	0.217	0.009	858.518	0.066	-
2014_Sweeper_D	1.042	3.490	8.138	0.497	0.457	0.010	852.394	0.251	-
2014_Top handler_D	0.782	1.614	9.850	0.302	0.278	0.010	852.043	0.081	-
2014_Top handler_D	0.672	1.445	5.448	0.188	0.173	0.008	853.218	0.065	-
2014_Top handler_D	0.602	1.378	2.891	0.172	0.158	0.008	854.160	0.059	-
2014_Top handler_D	0.696	1.465	2.999	0.188	0.173	0.008	854.079	0.054	-
2014_Top handler_D	0.236	1.073	1.430	0.011	0.010	0.008	854.065	0.027	-
2014_Top handler_D	0.070	0.946	0.261	0.009	0.008	0.008	850.994	0.011	-
2014_Truck_D	0.343	1.128	4.667	0.128	0.117	0.010	852.537	0.066	-
2014_Truck_D	0.358	1.153	2.612	0.131	0.120	0.010	852.522	0.065	-
2014_Truck_D	0.546	1.247	7.772	0.206	0.189	0.008	852.351	0.069	-
2014_Yard tractor_LPG	1.557	20.773	11.026	0.060	0.060	-	674.859	0.220	-
2014_Yard tractor_LPG	1.498	34.964	5.998	0.060	0.060	-	674.859	0.206	-
2014_Yard tractor_LPG	2.035	32.242	6.339	0.060	0.060	-	674.859	0.062	-
2014_Yard tractor_LPG	0.837	2.620	1.285	0.060	0.060	-	674.859	0.056	-
2014_Yard tractor_LPG	0.119	17.961	0.537	0.060	0.060	-	674.859	0.039	-

Note: Emission factors for diesel equiment from California ARB CHE Inventory Tool

Propane equipment emission factors for NOX and HC are from LSI Rule. EFs for remaining pollutants are based on CNG forklift emission rates from Offroad2007.

Table B1-33. 2014 Unmitigated Scenario Annual Mass Emissions

2014

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2014_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	32,248	0.00	0.05	0.09	0.00	0.00	0.00	30	0.00	-	0.00
2014_Forklift_D	-	-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	50,578	0.01	0.10	0.29	0.01	0.01	0.00	48	0.00	-	0.01
2014_Forklift_D	40,845	0.01	0.05	0.20	0.00	0.00	0.00	38	0.00	-	0.00
2014_Forklift_D	3,567	0.00	0.00	0.01	0.00	0.00	0.00	3	0.00	-	0.00
2014_Forklift_D	2,147	0.00	0	0.01	0.00	0.00	0.00	2	0.00	-	0.00
2014_Forklift_D	58,279	0.02	0.05	0.35	0.01	0.01	0.00	54.76	0.00	-	0.01
2014_Forklift_LPG	1,235	0.00	0.00	0.00	0.00	0.00	-	0.92	0.00	-	-
2014_Forklift_LPG	28,653	0.02	0.63	0.08	0.00	0.00	-	21.31	0.01	-	-
2014_Forklift_LPG	11,155	0.00	0.03	0.01	0.00	0.00	-	8.30	0.00	-	-
2014_Forklift_LPG	34	0.00	0.00	0.00	0.00	0.00	-	0.02	0.00	-	-
2014_Forklift_LPG	31,024	0.05	0.75	0.31	0.00	0.00	-	23.08	0.01	-	-
2014_Rub-trd Gantry Crane_D	64,444	0.02	0.08	0.10	0.00	0.00	0.00	60.56	0.00	-	0.00
2014_Rub-trd Gantry Crane_D	245,228	0.04	0.01	1.43	0.03	0.02	0.00	230.35	0.02	-	0.03
2014_Rub-trd Gantry Crane_D	195,462	0.04	0.22	0.30	0.00	0.00	0.00	183.17	0.00	-	0.00
2014_Rub-trd Gantry Crane_D	1,932,013	0.46	0.07	13.71	0.28	0.26	0.02	1,771.64	0.14	-	0.28
2014_Rub-trd Gantry Crane_D	178,968	0.03	0.01	1.77	0.03	0.03	0.00	168.99	0.01	-	0.03
2014_Rub-trd Gantry Crane_D	1,466,830	0.33	0.05	9.41	0.19	0.18	0.01	1,388.12	0.11	-	0.19
2014_Sweeper_D	-	-	-	-	-	-	-	-	-	-	-
2014_Top handler_D	1,743,853	0.11	0.31	18.93	0.09	0.08	0.02	1,637.83	0.16	-	0.09
2014_Top handler_D	1,474,562	0.08	0.23	8.86	0.05	0.04	0.01	1,386.82	0.11	-	0.05
2014_Top handler_D	1,348,174	0.06	0.20	4.30	0.04	0.04	0.01	1,269.35	0.09	-	0.04
2014_Top handler_D	4,974,868	0.27	0.80	16.45	0.15	0.14	0.05	4,683.57	0.30	-	0.15
2014_Top handler_D	842,354	0.22	1.00	1.33	0.01	0.01	0.01	793.02	0.03	-	0.01
2014_Top handler_D	211,957	0.02	0.22	0.06	0.00	0.00	0.00	198.82	0.00	-	0.00
2014_Truck_D	148,070	0.00	0.02	0.76	0.00	0.00	0.00	139.15	0.01	-	0.00
2014_Truck_D	213,726	0.08	0.27	0.62	0.03	0.03	0.00	200.84	0.02	-	0.03
2014_Truck_D	91,227	0.00	0.01	0.78	0.00	0.00	0.00	85.71	0.01	-	0.00
2014_Yard tractor_LPG	30,438	0.05	0.70	0.37	0.00	0.00	-	22.64	0.01	-	-
2014_Yard tractor_LPG	4,851,860	8.01	186.99	32.08	0.32	0.32	-	3,609.26	1.10	-	-
2014_Yard tractor_LPG	6,764,593	15.17	240.41	47.27	0.44	0.44	-	5,032.13	0.46	-	-
2014_Yard tractor_LPG	5,141,295	4.75	14.85	7.28	0.34	0.34	-	3,824.57	0.32	-	-
2014_Yard tractor_LPG	1,612,894	0.21	31.93	0.95	0.11	0.11	-	1,199.82	0.07	-	-

Table B1-34. 2014 Unmitigated Scenario Peak Day Emissions

2014

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2014_Electric Wharf Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	0.0042	0.04	0.39	0.76	0.02	0.02	0.00	252	0.02	-	0.02
2014_Forklift_D	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	0.0042	0.12	0.86	2.39	0.07	0.06	0.00	395	0.04	-	0.07
2014_Forklift_D	0.0042	0.04	0.46	1.69	0.03	0.03	0.00	319	0.03	-	0.03
2014_Forklift_D	0.0042	0.00	0.01	0.08	0.00	0.00	0.00	28	0.00	-	0.00
2014_Forklift_D	0.0042	0.00	0	0.04	0.00	0.00	0.00	17	0.00	-	0.00
2014_Forklift_D	0.0042	0.15	0.38	2.88	0.05	0.05	0.01	455.39	0.04	-	0.05
2014_Forklift_LPG	0.0042	0.00	0.04	0.00	0.00	0.00	-	7.64	0.00	-	-
2014_Forklift_LPG	0.0042	0.15	5.25	0.69	0.02	0.02	-	177.25	0.05	-	-
2014_Forklift_LPG	0.0042	0.02	0.25	0.11	0.01	0.01	-	69.01	0.01	-	-
2014_Forklift_LPG	0.0042	0.00	0.01	0.00	0.00	0.00	-	0.21	0.00	-	-
2014_Forklift_LPG	0.0042	0.40	6.25	2.59	0.02	0.02	-	191.92	0.05	-	-
2014_Rub-trd Gantry Crane_D	0.0042	0.15	0.68	0.86	0.01	0.01	0.01	503.62	0.02	-	0.01
2014_Rub-trd Gantry Crane_D	0.0042	0.33	0.06	11.86	0.21	0.20	0.02	1,915.58	0.15	-	0.21
2014_Rub-trd Gantry Crane_D	0.0042	0.30	1.81	2.45	0.02	0.02	0.02	1,523.21	0.04	-	0.02
2014_Rub-trd Gantry Crane_D	0.0042	3.86	0.56	114.04	2.32	2.14	0.15	14,732.91	1.14	-	2.32
2014_Rub-trd Gantry Crane_D	0.0042	0.25	0.05	14.71	0.26	0.24	0.01	1,405.29	0.12	-	0.26
2014_Rub-trd Gantry Crane_D	0.0042	2.72	0.40	78.29	1.58	1.46	0.12	11,543.57	0.89	-	1.58
2014_Sweeper_D	0.0042	-	-	-	-	-	-	-	-	-	-
2014_Top handler_D	0.0042	0.87	2.58	157.45	0.72	0.67	0.15	13,620.16	1.29	-	0.72
2014_Top handler_D	0.0042	0.64	1.95	73.64	0.38	0.35	0.11	11,532.78	0.87	-	0.38
2014_Top handler_D	0.0042	0.52	1.70	35.73	0.32	0.29	0.10	10,555.92	0.73	-	0.32
2014_Top handler_D	0.0042	2.22	6.68	136.77	1.28	1.18	0.38	38,948.49	2.46	-	1.28
2014_Top handler_D	0.0042	1.82	8.28	11.04	0.09	0.08	0.06	6,594.72	0.21	-	0.09
2014_Top handler_D	0.0042	0.14	1.84	0.51	0.02	0.02	0.02	1,653.42	0.02	-	0.02
2014_Truck_D	0.0042	0.03	0.15	6.33	0.03	0.02	0.01	1,157.16	0.09	-	0.03
2014_Truck_D	0.0042	0.70	2.26	5.12	0.26	0.24	0.02	1,670.22	0.13	-	0.26
2014_Truck_D	0.0042	0.03	0.10	6.50	0.03	0.02	0.01	712.77	0.06	-	0.03
2014_Yard tractor_LPG	0.0042	0.43	5.80	3.08	0.02	0.02	-	188.30	0.06	-	-
2014_Yard tractor_LPG	0.0042	66.62	1,555.04	266.78	2.65	2.65	-	30,014.59	9.15	-	-
2014_Yard tractor_LPG	0.0042	126.16	1,999.25	393.06	3.70	3.70	-	41,847.14	3.86	-	-
2014_Yard tractor_LPG	0.0042	39.47	123.46	60.55	2.81	2.81	-	31,805.09	2.66	-	-
2014_Yard tractor_LPG	0.0042	1.75	265.55	7.93	0.88	0.88	-	9,977.69	0.57	-	-

8hr/24hr Peaking Factor*: 0.489622946

**Note: Using same peaking factor that is applied to trucks*

Table B1-35. 2014 Unmitigated Scenario Eight Hour Peak Emissions

2014	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2014_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	0.02	0.19	0.37	0.01	0.01	0.00	123	0.01	-	0.01
2014_Forklift_D	-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	0.06	0.42	1.17	0.03	0.03	0.00	194	0.02	-	0.03
2014_Forklift_D	0.02	0.22	0.83	0.01	0.01	0.00	156	0.01	-	0.01
2014_Forklift_D	0.00	0.00	0.04	0.00	0.00	0.00	14	0.00	-	0.00
2014_Forklift_D	0.00	0.03	0.02	0.00	0.00	0.00	8	0.00	-	0.00
2014_Forklift_D	0.073	0.186	1.411	0.024	0.022	0.003	223	0.018	-	0.02
2014_Forklift_LPG	0.000	0.018	0.002	0.000	0.000	-	4	0.000	-	-
2014_Forklift_LPG	0.072	2.568	0.339	0.008	0.008	-	87	0.024	-	-
2014_Forklift_LPG	0.010	0.120	0.054	0.003	0.003	-	34	0.003	-	-
2014_Forklift_LPG	0.000	0.002	0.002	0.000	0.000	-	0	0.000	-	-
2014_Forklift_LPG	0.194	3.061	1.267	0.008	0.008	-	94	0.026	-	-
2014_Rub-trd Gantry Crane_D	0.075	0.334	0.420	0.003	0.003	0.003	247	0.008	-	0.00
2014_Rub-trd Gantry Crane_D	0.163	0.029	5.808	0.104	0.096	0.009	938	0.072	-	0.10
2014_Rub-trd Gantry Crane_D	0.146	0.884	1.202	0.009	0.008	0.007	746	0.018	-	0.01
2014_Rub-trd Gantry Crane_D	1.892	0.274	55.837	1.137	1.046	0.073	7,214	0.560	-	1.14
2014_Rub-trd Gantry Crane_D	0.124	0.024	7.202	0.127	0.117	0.007	688	0.060	-	0.13
2014_Rub-trd Gantry Crane_D	1.330	0.198	38.332	0.776	0.714	0.057	5,652	0.435	-	0.78
2014_Sweeper_D	-	-	-	-	-	-	-	-	-	-
2014_Top handler_D	0.428	1.263	77.091	0.354	0.326	0.075	6,669	0.634	-	0.35
2014_Top handler_D	0.311	0.956	36.058	0.187	0.172	0.055	5,647	0.428	-	0.19
2014_Top handler_D	0.255	0.834	17.494	0.156	0.143	0.051	5,168	0.359	-	0.16
2014_Top handler_D	1.088	3.272	66.966	0.628	0.578	0.187	19,070	1.204	-	0.63
2014_Top handler_D	0.891	4.056	5.407	0.042	0.039	0.032	3,229	0.103	-	0.04
2014_Top handler_D	0.067	0.900	0.248	0.009	0.008	0.008	810	0.010	-	0.01
2014_Truck_D	0.016	0.075	3.101	0.013	0.012	0.006	567	0.044	-	0.01
2014_Truck_D	0.344	1.106	2.506	0.125	0.115	0.009	818	0.062	-	0.13
2014_Truck_D	0.016	0.051	3.182	0.013	0.012	0.003	349	0.028	-	0.01
2014_Yard tractor_LPG	0.213	2.838	1.506	0.008	0.008	-	92	0.030	-	-
2014_Yard tractor_LPG	32.619	761.384	130.622	1.299	1.299	-	14,696	4.479	-	-
2014_Yard tractor_LPG	61.773	978.881	192.451	1.811	1.811	-	20,489	1.890	-	-
2014_Yard tractor_LPG	19.324	60.447	29.646	1.377	1.377	-	15,573	1.301	-	-
2014_Yard tractor_LPG	0.858	130.021	3.884	0.432	0.432	-	4,885	0.280	-	-

1hr/24hr Peaking Factor*: 0.070410261

**Note: Using same peaking factor that is applied to trucks*

Table B1-36. 2014 Unmitigated Scenario One Hour Peak Emissions

2014	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2014	-	-	-	-	-	-	-	-	-	-
General name	0.00	0.03	0.05	0.00	0.00	0.00	18	0.00	-	0.00
2014_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2014_Forklift_D	0.01	0.06	0.17	0.00	0.00	0.00	28	0.00	-	0.00
2014_Forklift_D	0.00	0.03	0.12	0.00	0.00	0.00	22	0.00	-	0.00
2014_Forklift_D	0.00	0.00	0.01	0.00	0.00	0.00	2	0.00	-	0.00
2014_Forklift_D	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00	-	0.00
2014_Forklift_D	0.010	0.027	0.203	0.004	0.003	0.000	32	0.003	-	0.00
2014_Forklift_D	0.000	0.003	0.000	0.000	0.000	-	1	0.000	-	-
2014_Forklift_D	0.010	0.369	0.049	0.001	0.001	-	12	0.003	-	-
2014_Forklift_LPG	0.001	0.017	0.008	0.000	0.000	-	5	0.000	-	-
2014_Forklift_LPG	0.000	0.000	0.000	0.000	0.000	-	0	0.000	-	-
2014_Forklift_LPG	0.028	0.440	0.182	0.001	0.001	-	14	0.004	-	-
2014_Forklift_LPG	0.011	0.048	0.060	0.000	0.000	0.000	35	0.001	-	0.00
2014_Forklift_LPG	0.023	0.004	0.835	0.015	0.014	0.001	135	0.010	-	0.02
2014_Rub-trd Gantry Crane_D	0.021	0.127	0.173	0.001	0.001	0.001	107	0.003	-	0.00
2014_Rub-trd Gantry Crane_D	0.272	0.039	8.030	0.163	0.150	0.010	1,037	0.081	-	0.16
2014_Rub-trd Gantry Crane_D	0.018	0.003	1.036	0.018	0.017	0.001	99	0.009	-	0.02
2014_Rub-trd Gantry Crane_D	0.191	0.028	5.512	0.112	0.103	0.008	813	0.063	-	0.11
2014_Rub-trd Gantry Crane_D	-	-	-	-	-	-	-	-	-	-
2014_Rub-trd Gantry Crane_D	0.062	0.182	11.086	0.051	0.047	0.011	959	0.091	-	0.05
2014_Sweeper_D	0.045	0.138	5.185	0.027	0.025	0.008	812	0.061	-	0.03
2014_Top handler_D	0.037	0.120	2.516	0.022	0.021	0.007	743	0.052	-	0.02
2014_Top handler_D	0.156	0.471	9.630	0.090	0.083	0.027	2,742	0.173	-	0.09
2014_Top handler_D	0.128	0.583	0.778	0.006	0.006	0.005	464	0.015	-	0.01
2014_Top handler_D	0.010	0.129	0.036	0.001	0.001	0.001	116	0.001	-	0.00
2014_Top handler_D	0.002	0.011	0.446	0.002	0.002	0.001	81	0.006	-	0.00
2014_Top handler_D	0.049	0.159	0.360	0.018	0.017	0.001	118	0.009	-	0.02
2014_Truck_D	0.002	0.007	0.458	0.002	0.002	0.000	50	0.004	-	0.00
2014_Truck_D	0.031	0.408	0.217	0.001	0.001	-	13	0.004	-	-
2014_Truck_D	4.691	109.491	18.784	0.187	0.187	-	2,113	0.644	-	-
2014_Yard tractor_LPG	8.883	140.768	27.675	0.260	0.260	-	2,946	0.272	-	-
2014_Yard tractor_LPG	2.779	8.693	4.263	0.198	0.198	-	2,239	0.187	-	-
2014_Yard tractor_LPG	0.123	18.698	0.559	0.062	0.062	-	703	0.040	-	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2023

Table B1-37. 2023 Proposed Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0		0	-
Forklift	0	2020	Electric	0.3	2		0	1,428
Forklift	0	2020	Electric	0.3	2		0	373
Forklift	0	2020	Electric	0.3	2		0	500
Forklift	0	2020	Electric	0.3	1		0	369
Forklift	137	2021	Diesel	0.3	1		0	822
Forklift	152	2019	Diesel	0.3	2		0	3,920
Forklift	152	2020	Diesel	0.3	2		0	1,625
Rub-trd Gantry Crane	0	0	Electric	0.2	0		0	-
Rub-trd Gantry Crane	197	2011	Diesel	0.2	1		0	383
Rub-trd Gantry Crane	197	2015	Diesel	0.2	5		0	14,366
Rub-trd Gantry Crane	197	2019	Diesel	0.2	5		0	6,256
Rub-trd Gantry Crane	197	2021	Diesel	0.2	8		0	8,745
Rub-trd Gantry Crane	197	2023	Diesel	0.2	2		0	1,880
Sweeper	100	2015	Diesel	0.68	0		0	-
Top handler	250	2019	Diesel	0.59	8		0	14,343
Top handler	260	2019	Diesel	0.59	3		0	5,658
Top handler	260	2021	Diesel	0.59	8		0	13,213
Top handler	260	2023	Diesel	0.59	15		0	46,244
Top handler	335	2023	Diesel	0.59	3		0	8,668
Top handler	370	2023	Diesel	0.59	1		0	2,947
Truck	250	2017	Diesel	0.51	2		0	1,623
Truck	250	2020	Diesel	0.51	2		0	2,342
Truck	275	2014	Diesel	0.51	1		0	909
Yard tractor	195	2019	LPG	0.39	53		0	92,388
Yard tractor	195	2020	LPG	0.39	59		0	125,838
Yard tractor	195	2023	LPG	0.39	43		0	107,679
Yard tractor	231	2023	LPG	0.39	23		0	35,295

Table B1-38. 2023 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2023_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-
2023_Forklift_Diesel	0.079	2.853	0.263	0.009	0.009	0.010	852.458	0.018	-
2023_Forklift_Diesel	0.157	3.307	0.285	0.012	0.011	0.010	852.445	0.025	-
2023_Forklift_Diesel	0.087	2.901	0.265	0.010	0.009	0.010	852.467	0.022	-
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	0.692	1.700	1.828	0.019	0.017	0.010	852.538	0.047	-
2023_Rub-trd Gantry Crane_Diesel	0.329	1.465	0.332	0.016	0.014	0.010	852.383	0.031	-
2023_Rub-trd Gantry Crane_Diesel	0.120	1.052	0.274	0.010	0.009	0.010	852.462	0.022	-
2023_Rub-trd Gantry Crane_Diesel	0.088	0.989	0.266	0.009	0.009	0.010	852.405	0.016	-
2023_Rub-trd Gantry Crane_Diesel	0.063	0.940	0.259	0.009	0.008	0.010	852.404	0.011	-
2023_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.427	0.042	-
2023_Top handler_Diesel	0.149	1.109	0.282	0.011	0.010	0.010	852.038	0.021	-
2023_Top handler_Diesel	0.153	1.119	0.284	0.011	0.010	0.008	850.012	0.021	-
2023_Top handler_Diesel	0.106	1.025	0.270	0.010	0.009	0.008	852.266	0.016	-
2023_Top handler_Diesel	0.086	0.985	0.265	0.009	0.009	0.008	851.233	0.011	-
2023_Top handler_Diesel	0.084	0.966	0.264	0.009	0.009	0.008	851.233	0.011	-
2023_Top handler_Diesel	0.084	0.967	0.265	0.009	0.009	0.008	851.233	0.011	-
2023_Truck_Diesel	0.127	1.066	0.276	0.010	0.010	0.010	852.406	0.031	-
2023_Truck_Diesel	0.120	1.053	0.274	0.010	0.009	0.010	852.402	0.028	-
2023_Truck_Diesel	0.171	1.153	0.288	0.012	0.011	0.008	852.426	0.031	-
2023_Yard tractor_LPG	0.142	22.060	0.281	0.011	0.010	-	674.859	0.045	-
2023_Yard tractor_LPG	0.140	21.643	0.281	0.011	0.010	-	674.859	0.039	-
2023_Yard tractor_LPG	0.062	8.028	0.263	0.009	0.008	-	674.859	0.021	-
2023_Yard tractor_LPG	0.049	5.838	0.260	0.009	0.008	-	674.859	0.021	-

Table B1-39. 2023 Proposed Mitigated Scenario Annual Mass Emissions

2023		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Diesel	33,768	0.00	0.11	0.01	0.00	0.00	0.00	31.73	0.00	-	0.00
2023_Forklift_Diesel	178,774	0.03	0.65	0.06	0.00	0.00	0.00	167.98	0.00	-	0.00
2023_Forklift_Diesel	74,118	0.01	0.24	0.02	0.00	0.00	0.00	69.65	0.00	-	0.00
2023_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	15,094	0.01	0.03	0.03	0.00	0.00	0.00	14.18	0.00	-	0.00
2023_Rub-trd Gantry Crane_Diesel	566,022	0.21	0.91	0.21	0.01	0.01	0.01	531.82	0.02	-	0.01
2023_Rub-trd Gantry Crane_Diesel	246,483	0.03	0.29	0.07	0.00	0.00	0.00	231.61	0.01	-	0.00
2023_Rub-trd Gantry Crane_Diesel	344,562	0.03	0.38	0.10	0.00	0.00	0.00	323.75	0.01	-	0.00
2023_Rub-trd Gantry Crane_Diesel	74,079	0.01	0.08	0.02	0.00	0.00	0.00	69.61	0.00	-	0.00
2023_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2023_Top handler_Diesel	2,115,523	0.35	2.59	0.66	0.03	0.02	0.02	1,986.89	0.05	-	0.03
2023_Top handler_Diesel	867,978	0.15	1.07	0.27	0.01	0.01	0.01	813.26	0.02	-	0.01
2023_Top handler_Diesel	2,026,837	0.24	2.29	0.60	0.02	0.02	0.02	1,904.11	0.04	-	0.02
2023_Top handler_Diesel	7,093,887	0.67	7.70	2.07	0.07	0.07	0.07	6,656.25	0.08	-	0.07
2023_Top handler_Diesel	1,713,275	0.16	1.82	0.50	0.02	0.02	0.02	1,607.58	0.02	-	0.02
2023_Top handler_Diesel	643,252	0.06	0.69	0.19	0.01	0.01	0.01	603.57	0.01	-	0.01
2023_Truck_Diesel	206,909	0.03	0.24	0.06	0.00	0.00	0.00	194.41	0.01	-	0.00
2023_Truck_Diesel	298,653	0.04	0.35	0.09	0.00	0.00	0.00	280.61	0.01	-	0.00
2023_Truck_Diesel	127,477	0.02	0.16	0.04	0.00	0.00	0.00	119.78	0.00	-	0.00
2023_Yard tractor_LPG	7,026,094	1.10	170.85	2.18	0.08	0.08	-	5,226.66	0.35	-	-
2023_Yard tractor_LPG	9,569,984	1.47	228.31	2.96	0.11	0.11	-	7,119.04	0.41	-	-
2023_Yard tractor_LPG	8,189,010	0.56	72.47	2.38	0.08	0.08	-	6,091.74	0.19	-	-
2023_Yard tractor_LPG	3,179,717	0.17	20.46	0.91	0.03	0.03	-	2,365.37	0.07	-	-

Table B1-40. 2023 Proposed Mitigated Scenario Peak Day Emissions

2023		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Diesel	0.0040	0.02	0.86	0.08	0.00	0.00	0.00	257	0.01	-	0.00
2023_Forklift_Diesel	0.0040	0.25	5	0.45	0.02	0.02	0.02	1,360	0.04	-	0.02
2023_Forklift_Diesel	0.0040	0.06	1.92	0.18	0.01	0.01	0.01	564.04	0.01	-	0.01
2023_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.09	0.23	0.25	0.00	0.00	0.00	114.87	0.01	-	0.00
2023_Rub-trd Gantry Crane_Diesel	0.0040	1.66	7.40	1.68	0.08	0.07	0.05	4,307.05	0.16	-	0.08
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.26	2.31	0.60	0.02	0.02	0.02	1,875.75	0.05	-	0.02
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.27	3.04	0.82	0.03	0.03	0.03	2,621.96	0.05	-	0.03
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.04	0.62	0.17	0.01	0.01	0.01	563.71	0.01	-	0.01
2023_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Top handler_Diesel	0.0040	2.80	20.95	5.33	0.21	0.19	0.18	16,091.21	0.39	-	0.21
2023_Top handler_Diesel	0.0040	1.19	8.67	2.20	0.09	0.08	0.06	6,586.36	0.16	-	0.09
2023_Top handler_Diesel	0.0040	1.91	18.54	4.89	0.18	0.16	0.15	15,420.77	0.28	-	0.18
2023_Top handler_Diesel	0.0040	5.42	62.38	16.78	0.59	0.55	0.53	53,906.92	0.67	-	0.59
2023_Top handler_Diesel	0.0040	1.28	14.77	4.04	0.14	0.13	0.13	13,019.29	0.16	-	0.14
2023_Top handler_Diesel	0.0040	0.48	5.55	1.52	0.05	0.05	0.05	4,888.12	0.06	-	0.05
2023_Truck_Diesel	0.0040	0.23	1.97	0.51	0.02	0.02	0.02	1,574.48	0.06	-	0.02
2023_Truck_Diesel	0.0040	0.32	2.81	0.73	0.03	0.03	0.03	2,272.61	0.07	-	0.03
2023_Truck_Diesel	0.0040	0.19	1.31	0.33	0.01	0.01	0.01	970.06	0.04	-	0.01
2023_Yard tractor_LPG	0.0040	8.90	1,383.67	17.66	0.68	0.63	-	42,329.12	2.80	-	-
2023_Yard tractor_LPG	0.0040	11.92	1,849.05	24.00	0.93	0.85	-	57,654.93	3.30	-	-
2023_Yard tractor_LPG	0.0040	4.53	586.89	19.25	0.67	0.62	-	49,335.18	1.53	-	-
2023_Yard tractor_LPG	0.0040	1.40	165.71	7.39	0.25	0.23	-	19,156.39	0.60	-	-

8hr/24hr Peaking Factor*: 0.529716683

**Note: Using same peaking factor that is applied to trucks*

Table B1-41. 2023 Proposed Mitigated Scenario Eight Hour Peak Emissions

2023	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Diesel	0.01	0.46	0.04	0.00	0.00	0.00	136.13	0.00	0.00	0.00
2023_Forklift_Diesel	0.13	2.80	0.24	0.01	0.01	0.01	720.65	0.02	0.00	0.01
2023_Forklift_Diesel	0.03	1.02	0.09	0.00	0.00	0.00	298.78	0.01	0.00	0.00
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Diesel	0.05	0.12	0.13	0.00	0.00	0.00	60.85	0.00	0.00	0.00
2023_Rub-trd Gantry Crane_Diesel	0.88	3.92	0.89	0.04	0.04	0.03	2281.51	0.08	0.00	0.04
2023_Rub-trd Gantry Crane_Diesel	0.14	1.23	0.32	0.01	0.01	0.01	993.61	0.03	0.00	0.01
2023_Rub-trd Gantry Crane_Diesel	0.14	1.61	0.43	0.02	0.01	0.02	1388.89	0.03	0.00	0.02
2023_Rub-trd Gantry Crane_Diesel	0.02	0.33	0.09	0.00	0.00	0.00	298.61	0.00	0.00	0.00
2023_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Top handler_Diesel	1.49	11.10	2.82	0.11	0.10	0.10	8523.78	0.21	0.00	0.11
2023_Top handler_Diesel	0.63	4.59	1.16	0.05	0.04	0.03	3488.91	0.08	0.00	0.05
2023_Top handler_Diesel	1.01	9.82	2.59	0.09	0.09	0.08	8168.64	0.15	0.00	0.09
2023_Top handler_Diesel	2.87	33.04	8.89	0.31	0.29	0.28	28555.40	0.36	0.00	0.31
2023_Top handler_Diesel	0.68	7.82	2.14	0.08	0.07	0.07	6896.54	0.09	0.00	0.08
2023_Top handler_Diesel	0.26	2.94	0.80	0.03	0.03	0.03	2589.32	0.03	0.00	0.03
2023_Truck_Diesel	0.12	1.04	0.27	0.01	0.01	0.01	834.03	0.03	0.00	0.01
2023_Truck_Diesel	0.17	1.49	0.39	0.01	0.01	0.01	1203.84	0.04	0.00	0.01
2023_Truck_Diesel	0.10	0.70	0.17	0.01	0.01	0.01	513.86	0.02	0.00	0.01
2023_Yard tractor_LPG	4.72	732.95	9.35	0.36	0.33	0.00	22422.44	1.48	0.00	-
2023_Yard tractor_LPG	6.32	979.47	12.71	0.49	0.45	0.00	30540.78	1.75	0.00	-
2023_Yard tractor_LPG	2.40	310.89	10.20	0.36	0.33	0.00	26133.67	0.81	0.00	-
2023_Yard tractor_LPG	0.74	87.78	3.92	0.13	0.12	0.00	10147.46	0.32	0.00	-

1hr/24hr Peaking Factor*: 0.073685169
**Note: Using same peaking factor that is applied to trucks*

Table B1-42. 2023 Proposed Mitigated Scenario One Hour Peak Emissions

2023	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Forklift_Diesel	0.00	0.06	0.01	0.00	0.00	0.00	18.94	0.00	0.00	0.00
2023_Forklift_Diesel	0.02	0.39	0.03	0.00	0.00	0.00	100.24	0.00	0.00	0.00
2023_Forklift_Diesel	0.00	0.14	0.01	0.00	0.00	0.00	41.56	0.00	0.00	0.00
2023_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Rub-trd Gantry Crane_Diesel	0.01	0.02	0.02	0.00	0.00	0.00	8.46	0.00	0.00	0.00
2023_Rub-trd Gantry Crane_Diesel	0.12	0.55	0.12	0.01	0.01	0.00	317.37	0.01	0.00	0.01
2023_Rub-trd Gantry Crane_Diesel	0.02	0.17	0.04	0.00	0.00	0.00	138.21	0.00	0.00	0.00
2023_Rub-trd Gantry Crane_Diesel	0.02	0.22	0.06	0.00	0.00	0.00	193.20	0.00	0.00	0.00
2023_Rub-trd Gantry Crane_Diesel	0.00	0.05	0.01	0.00	0.00	0.00	41.54	0.00	0.00	0.00
2023_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2023_Top handler_Diesel	0.21	1.54	0.39	0.02	0.01	0.01	1185.68	0.03	0.00	0.02
2023_Top handler_Diesel	0.09	0.64	0.16	0.01	0.01	0.00	485.32	0.01	0.00	0.01
2023_Top handler_Diesel	0.14	1.37	0.36	0.01	0.01	0.01	1136.28	0.02	0.00	0.01
2023_Top handler_Diesel	0.40	4.60	1.24	0.04	0.04	0.04	3972.14	0.05	0.00	0.04
2023_Top handler_Diesel	0.09	1.09	0.30	0.01	0.01	0.01	959.33	0.01	0.00	0.01
2023_Top handler_Diesel	0.04	0.41	0.11	0.00	0.00	0.00	360.18	0.00	0.00	0.00
2023_Truck_Diesel	0.02	0.15	0.04	0.00	0.00	0.00	116.02	0.00	0.00	0.00
2023_Truck_Diesel	0.02	0.21	0.05	0.00	0.00	0.00	167.46	0.01	0.00	0.00
2023_Truck_Diesel	0.01	0.10	0.02	0.00	0.00	0.00	71.48	0.00	0.00	0.00
2023_Yard tractor_LPG	0.66	101.96	1.30	0.05	0.05	0.00	3119.03	0.21	0.00	-
2023_Yard tractor_LPG	0.88	136.25	1.77	0.07	0.06	0.00	4248.31	0.24	0.00	-
2023_Yard tractor_LPG	0.33	43.25	1.42	0.05	0.05	0.00	3635.27	0.11	0.00	-
2023_Yard tractor_LPG	0.10	12.21	0.54	0.02	0.02	0.00	1411.54	0.04	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2030

Table B1-42. 2030 Proposed Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0		0%	-
Forklift	0	2020	Electric	0.3	2		0%	1,594
Forklift	0	2020	Electric	0.3	2		0%	417
Forklift	0	2020	Electric	0.3	2		0%	558
Forklift	0	2020	Electric	0.3	1		0%	412
Forklift	137	2021	Diesel	0.3	1		0%	917
Forklift	152	2019	Diesel	0.3	2		0%	4,377
Forklift	152	2020	Diesel	0.3	2		0%	1,815
Rub-trd Gantry Crane	0	0	Electric	0.2	0		0%	-
Rub-trd Gantry Crane	197	2011	Diesel	0.2	1		0%	428
Rub-trd Gantry Crane	197	2015	Diesel	0.2	5		0%	16,040
Rub-trd Gantry Crane	197	2019	Diesel	0.2	5		0%	6,985
Rub-trd Gantry Crane	197	2021	Diesel	0.2	8		0%	9,764
Rub-trd Gantry Crane	197	2023	Diesel	0.2	2		0%	2,099
Sweeper	100	2025	Diesel	0.68	0		0%	-
Top handler	250	2019	Diesel	0.59	8		0%	16,014
Top handler	260	2019	Diesel	0.59	3		0%	6,318
Top handler	260	2021	Diesel	0.59	8		0%	14,753
Top handler	260	2023	Diesel	0.59	15		0%	51,633
Top handler	335	2023	Diesel	0.59	3		0%	9,678
Top handler	370	2023	Diesel	0.59	1		0%	3,290
Truck	250	2020	Diesel	0.51	2		0%	2,615
Truck	250	2029	Diesel	0.51	2		0%	1,812
Truck	275	2026	Diesel	0.51	1		0%	1,015
Yard tractor	195	2019	LPG	0.39	53		0%	103,154
Yard tractor	195	2020	LPG	0.39	59		0%	140,503
Yard tractor	195	2023	LPG	0.39	43		0%	120,228
Yard tractor	231	2023	LPG	0.39	23		0%	39,408

Table B1-43. 2030 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2030_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-
2030_Forklift_Diesel	0.141	3.209	0.280	0.011	0.010	0.010	852.441	0.031	-
2030_Forklift_Diesel	0.304	4.158	0.325	0.017	0.015	0.010	852.470	0.031	-
2030_Forklift_Diesel	0.148	3.254	0.282	0.012	0.011	0.010	852.467	0.031	-
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	1.029	2.124	2.121	0.024	0.022	0.010	852.521	0.047	-
2030_Rub-trd Gantry Crane_Diesel	0.544	1.890	0.391	0.021	0.019	0.010	852.371	0.031	-
2030_Rub-trd Gantry Crane_Diesel	0.213	1.237	0.300	0.013	0.012	0.010	852.451	0.031	-
2030_Rub-trd Gantry Crane_Diesel	0.170	1.151	0.288	0.012	0.011	0.010	852.413	0.031	-
2030_Rub-trd Gantry Crane_Diesel	0.133	1.079	0.278	0.011	0.010	0.010	852.523	0.029	-
2030_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.449	0.032	-
2030_Top handler_Diesel	0.283	1.374	0.319	0.014	0.013	0.010	852.991	0.031	-
2030_Top handler_Diesel	0.295	1.397	0.322	0.015	0.014	0.008	849.606	0.031	-
2030_Top handler_Diesel	0.229	1.268	0.304	0.013	0.012	0.008	852.222	0.031	-
2030_Top handler_Diesel	0.316	1.440	0.328	0.015	0.014	0.008	852.836	0.028	-
2030_Top handler_Diesel	0.300	1.285	0.324	0.015	0.014	0.008	852.836	0.028	-
2030_Top handler_Diesel	0.305	1.292	0.325	0.015	0.014	0.008	852.836	0.028	-
2030_Truck_Diesel	0.239	1.287	0.307	0.013	0.012	0.010	852.370	0.031	-
2030_Truck_Diesel	0.074	0.962	0.262	0.009	0.008	0.010	852.423	0.018	-
2030_Truck_Diesel	0.112	1.037	0.272	0.010	0.009	0.008	852.456	0.031	-
2030_Yard tractor_LPG	0.299	49.624	0.317	0.014	0.013	-	674.859	0.086	-
2030_Yard tractor_LPG	0.332	55.370	0.325	0.015	0.014	-	674.859	0.080	-
2030_Yard tractor_LPG	0.288	47.626	0.315	0.014	0.013	-	674.859	0.062	-
2030_Yard tractor_LPG	0.188	30.103	0.292	0.012	0.011	-	674.859	0.062	-

Table B1-44. 2030 Proposed Mitigated Scenario Annual Mass Emissions

2030		Annual Emissions (tons/year)									
General name	**(HP-Hrs)/Yr**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Diesel	37,704	0.01	0.13	0.01	0.00	0.00	0.00	35.43	0.00	-	0.00
2030_Forklift_Diesel	199,607	0.07	0.91	0.07	0.00	0.00	0.00	187.56	0.01	-	0.00
2030_Forklift_Diesel	82,755	0.01	0.30	0.03	0.00	0.00	0.00	77.76	0.00	-	0.00
2030_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	16,853	0.02	0.04	0.04	0.00	0.00	0.00	15.84	0.00	-	0.00
2030_Rub-trd Gantry Crane_Diesel	631,983	0.38	1.32	0.27	0.01	0.01	0.01	593.79	0.02	-	0.01
2030_Rub-trd Gantry Crane_Diesel	275,207	0.06	0.38	0.09	0.00	0.00	0.00	258.60	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	384,716	0.07	0.49	0.12	0.00	0.00	0.00	361.48	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	82,712	0.01	0.10	0.03	0.00	0.00	0.00	77.73	0.00	-	0.00
2030_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2030_Top handler_Diesel	2,362,055	0.74	3.58	0.83	0.04	0.03	0.02	2,220.91	0.08	-	0.04
2030_Top handler_Diesel	969,128	0.31	1.49	0.34	0.02	0.01	0.01	907.60	0.03	-	0.02
2030_Top handler_Diesel	2,263,034	0.57	3.16	0.76	0.03	0.03	0.02	2,125.89	0.08	-	0.03
2030_Top handler_Diesel	7,920,571	2.76	12.57	2.87	0.13	0.12	0.07	7,445.93	0.25	-	0.13
2030_Top handler_Diesel	1,912,931	0.63	2.71	0.68	0.03	0.03	0.02	1,798.30	0.06	-	0.03
2030_Top handler_Diesel	718,214	0.24	1.02	0.26	0.01	0.01	0.01	675.18	0.02	-	0.01
2030_Truck_Diesel	333,457	0.09	0.47	0.11	0.00	0.00	0.00	313.30	0.01	-	0.00
2030_Truck_Diesel	231,021	0.02	0.24	0.07	0.00	0.00	0.00	217.07	0.00	-	0.00
2030_Truck_Diesel	142,332	0.02	0.16	0.04	0.00	0.00	0.00	133.74	0.00	-	0.00
2030_Yard tractor_LPG	7,844,878	2.59	429.12	2.74	0.12	0.11	-	5,835.75	0.74	-	-
2030_Yard tractor_LPG	10,685,221	3.91	652.16	3.82	0.18	0.16	-	7,948.66	0.94	-	-
2030_Yard tractor_LPG	9,143,315	2.90	480.00	3.17	0.14	0.13	-	6,801.65	0.63	-	-
2030_Yard tractor_LPG	3,550,265	0.73	117.81	1.14	0.05	0.04	-	2,641.02	0.24	-	-

Table B1-45. 2030 Proposed Mitigated Scenario Peak Day Emissions

2030		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Diesel	0.0040	0.05	1.08	0.09	0.00	0.00	0.00	287	0.01	-	0.00
2030_Forklift_Diesel	0.0040	0.54	7	0.58	0.03	0.03	0.02	1,519	0.06	-	0.03
2030_Forklift_Diesel	0.0040	0.11	2.40	0.21	0.01	0.01	0.01	629.78	0.02	-	0.01
2030_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.15	0.32	0.32	0.00	0.00	0.00	128.26	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	0.0040	3.07	10.66	2.20	0.12	0.11	0.05	4,808.90	0.17	-	0.12
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.52	3.04	0.74	0.03	0.03	0.02	2,094.31	0.08	-	0.03
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.58	3.95	0.99	0.04	0.04	0.03	2,927.53	0.11	-	0.04
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.10	0.80	0.21	0.01	0.01	0.01	629.49	0.02	-	0.01
2030_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Top handler_Diesel	0.0040	5.96	28.97	6.73	0.30	0.28	0.20	17,986.48	0.65	-	0.30
2030_Top handler_Diesel	0.0040	2.55	12.09	2.79	0.13	0.12	0.07	7,350.39	0.27	-	0.13
2030_Top handler_Diesel	0.0040	4.63	25.62	6.15	0.26	0.24	0.17	17,216.94	0.63	-	0.26
2030_Top handler_Diesel	0.0040	22.37	101.83	23.21	1.08	0.99	0.59	60,302.34	2.00	-	1.08
2030_Top handler_Diesel	0.0040	5.12	21.95	5.53	0.25	0.23	0.14	14,563.88	0.48	-	0.25
2030_Top handler_Diesel	0.0040	1.95	8.29	2.08	0.10	0.09	0.05	5,468.04	0.18	-	0.10
2030_Truck_Diesel	0.0040	0.71	3.83	0.91	0.04	0.04	0.03	2,537.35	0.09	-	0.04
2030_Truck_Diesel	0.0040	0.15	1.98	0.54	0.02	0.02	0.02	1,758.00	0.04	-	0.02
2030_Truck_Diesel	0.0040	0.14	1.32	0.35	0.01	0.01	0.01	1,083.15	0.04	-	0.01
2030_Yard tractor_LPG	0.0040	20.95	3,475.30	22.22	1.00	0.92	-	47,261.93	6.01	-	-
2030_Yard tractor_LPG	0.0040	31.66	5,281.61	30.97	1.43	1.31	-	64,373.74	7.62	-	-
2030_Yard tractor_LPG	0.0040	23.48	3,887.40	25.68	1.14	1.05	-	55,084.44	5.08	-	-
2030_Yard tractor_LPG	0.0040	5.95	954.09	9.25	0.38	0.35	-	21,388.78	1.97	-	-

8hr/24hr Peaking Factor*: 0.529716683

**Note: Using same peaking factor that is applied to trucks*

Table B1-46. 2030 Proposed Mitigated Scenario Eight Hour Peak Emissions

2030	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Diesel	0.03	0.57	0.05	0.00	0.00	0.00	151.99	0.01	0.00	0.00
2030_Forklift_Diesel	0.29	3.92	0.31	0.02	0.01	0.01	804.66	0.03	0.00	0.02
2030_Forklift_Diesel	0.06	1.27	0.11	0.00	0.00	0.00	333.60	0.01	0.00	0.00
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Diesel	0.08	0.17	0.17	0.00	0.00	0.00	67.94	0.00	0.00	0.00
2030_Rub-trd Gantry Crane_Diesel	1.63	5.65	1.17	0.06	0.06	0.03	2547.35	0.09	0.00	0.06
2030_Rub-trd Gantry Crane_Diesel	0.28	1.61	0.39	0.02	0.02	0.01	1109.39	0.04	0.00	0.02
2030_Rub-trd Gantry Crane_Diesel	0.31	2.09	0.52	0.02	0.02	0.02	1550.76	0.06	0.00	0.02
2030_Rub-trd Gantry Crane_Diesel	0.05	0.42	0.11	0.00	0.00	0.00	333.45	0.01	0.00	0.00
2030_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Top handler_Diesel	3.16	15.34	3.56	0.16	0.15	0.11	9527.74	0.35	0.00	0.16
2030_Top handler_Diesel	1.35	6.40	1.48	0.07	0.06	0.04	3893.62	0.14	0.00	0.07
2030_Top handler_Diesel	2.45	13.57	3.26	0.14	0.13	0.09	9120.10	0.33	0.00	0.14
2030_Top handler_Diesel	11.85	53.94	12.29	0.57	0.53	0.31	31943.16	1.06	0.00	0.57
2030_Top handler_Diesel	2.71	11.63	2.93	0.13	0.12	0.08	7714.73	0.26	0.00	0.13
2030_Top handler_Diesel	1.03	4.39	1.10	0.05	0.05	0.03	2896.51	0.10	0.00	0.05
2030_Truck_Diesel	0.38	2.03	0.48	0.02	0.02	0.02	1344.08	0.05	0.00	0.02
2030_Truck_Diesel	0.08	1.05	0.29	0.01	0.01	0.01	931.24	0.02	0.00	0.01
2030_Truck_Diesel	0.08	0.70	0.18	0.01	0.01	0.01	573.76	0.02	0.00	0.01
2030_Yard tractor_LPG	11.10	1840.92	11.77	0.53	0.49	0.00	25035.43	3.19	0.00	-
2030_Yard tractor_LPG	16.77	2797.76	16.41	0.75	0.69	0.00	34099.84	4.04	0.00	-
2030_Yard tractor_LPG	12.44	2059.22	13.60	0.61	0.56	0.00	29179.15	2.69	0.00	-
2030_Yard tractor_LPG	3.15	505.40	4.90	0.20	0.18	0.00	11329.99	1.04	0.00	-

1hr/24hr Peaking Factor*: 0.073685169

**Note: Using same peaking factor that is applied to trucks*

Table B1-47. 2030 Proposed Mitigated Scenario One Hour Peak Emissions

2030	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Forklift_Diesel	0.00	0.08	0.01	0.00	0.00	0.00	21.14	0.00	0.00	0.00
2030_Forklift_Diesel	0.04	0.55	0.04	0.00	0.00	0.00	111.93	0.00	0.00	0.00
2030_Forklift_Diesel	0.01	0.18	0.02	0.00	0.00	0.00	46.41	0.00	0.00	0.00
2030_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Rub-trd Gantry Crane_Diesel	0.01	0.02	0.02	0.00	0.00	0.00	9.45	0.00	0.00	0.00
2030_Rub-trd Gantry Crane_Diesel	0.23	0.79	0.16	0.01	0.01	0.00	354.34	0.01	0.00	0.01
2030_Rub-trd Gantry Crane_Diesel	0.04	0.22	0.05	0.00	0.00	0.00	154.32	0.01	0.00	0.00
2030_Rub-trd Gantry Crane_Diesel	0.04	0.29	0.07	0.00	0.00	0.00	215.72	0.01	0.00	0.00
2030_Rub-trd Gantry Crane_Diesel	0.01	0.06	0.02	0.00	0.00	0.00	46.38	0.00	0.00	0.00
2030_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2030_Top handler_Diesel	0.44	2.13	0.50	0.02	0.02	0.01	1325.34	0.05	0.00	0.02
2030_Top handler_Diesel	0.19	0.89	0.21	0.01	0.01	0.01	541.61	0.02	0.00	0.01
2030_Top handler_Diesel	0.34	1.89	0.45	0.02	0.02	0.01	1268.63	0.05	0.00	0.02
2030_Top handler_Diesel	1.65	7.50	1.71	0.08	0.07	0.04	4443.39	0.15	0.00	0.08
2030_Top handler_Diesel	0.38	1.62	0.41	0.02	0.02	0.01	1073.14	0.04	0.00	0.02
2030_Top handler_Diesel	0.14	0.61	0.15	0.01	0.01	0.00	402.91	0.01	0.00	0.01
2030_Truck_Diesel	0.05	0.28	0.07	0.00	0.00	0.00	186.96	0.01	0.00	0.00
2030_Truck_Diesel	0.01	0.15	0.04	0.00	0.00	0.00	129.54	0.00	0.00	0.00
2030_Truck_Diesel	0.01	0.10	0.03	0.00	0.00	0.00	79.81	0.00	0.00	0.00
2030_Yard tractor_LPG	1.54	256.08	1.64	0.07	0.07	0.00	3482.50	0.44	0.00	-
2030_Yard tractor_LPG	2.33	389.18	2.28	0.11	0.10	0.00	4743.39	0.56	0.00	-
2030_Yard tractor_LPG	1.73	286.44	1.89	0.08	0.08	0.00	4058.91	0.37	0.00	-
2030_Yard tractor_LPG	0.44	70.30	0.68	0.03	0.03	0.00	1576.04	0.15	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2036

Table B1-48. 2036 Proposed Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0		0%	-
Forklift	0	2036	Electric	0.3	2		0%	1,594
Forklift	0	2036	Electric	0.3	2		0%	417
Forklift	0	2036	Electric	0.3	2		0%	558
Forklift	0	2036	Electric	0.3	1		0%	412
Forklift	137	2021	Diesel	0.3	1		0%	917
Forklift	152	2035	Diesel	0.3	2		0%	4,377
Forklift	152	2036	Diesel	0.3	2		0%	1,815
Rub-trd Gantry Crane	0	0	Electric	0.2	4		0%	5,588
Rub-trd Gantry Crane	197	2015	Diesel	0.2	5		0%	16,040
Rub-trd Gantry Crane	197	2019	Diesel	0.2	1		0%	1,397
Rub-trd Gantry Crane	197	2021	Diesel	0.2	8		0%	9,764
Rub-trd Gantry Crane	197	2023	Diesel	0.2	2		0%	2,099
Rub-trd Gantry Crane	197	2035	Diesel	0.2	1		0%	428
Sweeper	100	2025	Diesel	0.68	0		0%	-
Top handler	250	2035	Diesel	0.59	8		0%	16,014
Top handler	260	2021	Diesel	0.59	8		0%	14,753
Top handler	260	2023	Diesel	0.59	15		0%	51,633
Top handler	260	2035	Diesel	0.59	3		0%	6,318
Top handler	335	2023	Diesel	0.59	3		0%	9,678
Top handler	370	2023	Diesel	0.59	1		0%	3,290
Truck	250	2029	Diesel	0.51	2		0%	1,812
Truck	250	2032	Diesel	0.51	2		0%	2,615
Truck	275	2026	Diesel	0.51	1		0%	1,015
Yard tractor	195	2031	LPG	0.39	53		0%	103,154
Yard tractor	195	2032	LPG	0.39	59		0%	140,503
Yard tractor	195	2035	LPG	0.39	43		0%	120,228
Yard tractor	231	2035	LPG	0.39	23		0%	39,408

Table B1-49. 2036 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
2036_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-
2036_Forklift_Diesel	0.193	3.515	0.294	0.013	0.012	0.010	852.463	0.031	-
2036_Forklift_Diesel	0.095	2.943	0.267	0.010	0.009	0.010	852.443	0.015	-
2036_Forklift_Diesel	0.061	2.750	0.258	0.009	0.008	0.010	852.453	0.012	-
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	0.729	2.253	0.441	0.026	0.024	0.010	852.811	0.031	-
2036_Rub-trd Gantry Crane_Diesel	0.293	1.395	0.322	0.015	0.014	0.010	852.600	0.031	-
2036_Rub-trd Gantry Crane_Diesel	0.240	1.289	0.307	0.013	0.012	0.010	852.455	0.031	-
2036_Rub-trd Gantry Crane_Diesel	0.193	1.198	0.295	0.012	0.011	0.010	852.477	0.031	-
2036_Rub-trd Gantry Crane_Diesel	0.114	1.041	0.273	0.010	0.009	0.010	852.471	0.014	-
2036_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.456	0.045	-
2036_Top handler_Diesel	0.091	0.996	0.266	0.010	0.009	0.010	852.558	0.013	-
2036_Top handler_Diesel	0.335	1.477	0.333	0.016	0.014	0.008	853.665	0.031	-
2036_Top handler_Diesel	0.514	1.830	0.382	0.020	0.019	0.008	853.510	0.031	-
2036_Top handler_Diesel	0.093	1.000	0.267	0.010	0.009	0.008	851.703	0.013	-
2036_Top handler_Diesel	0.485	1.559	0.374	0.020	0.018	0.008	853.510	0.031	-
2036_Top handler_Diesel	0.494	1.572	0.377	0.020	0.018	0.008	853.510	0.031	-
2036_Truck_Diesel	0.137	1.087	0.279	0.011	0.010	0.010	852.416	0.031	-
2036_Truck_Diesel	0.137	1.087	0.279	0.011	0.010	0.010	852.448	0.031	-
2036_Truck_Diesel	0.183	1.177	0.292	0.012	0.011	0.008	852.513	0.031	-
2036_Yard tractor_LPG	0.164	25.998	0.287	0.011	0.010	-	674.859	0.050	-
2036_Yard tractor_LPG	0.167	26.461	0.287	0.011	0.011	-	674.859	0.045	-
2036_Yard tractor_LPG	0.094	13.685	0.271	0.010	0.009	-	674.859	0.027	-
2036_Yard tractor_LPG	0.069	9.304	0.265	0.009	0.009	-	674.859	0.027	-

Table B1-50. 2036 Proposed Mitigated Scenario Annual Mass Emissions

2036		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2036_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Diesel	37,704	0.01	0.15	0.01	0.00	0.00	0.00	35.43	0.00	-	0.00
2036_Forklift_Diesel	199,607	0.02	0.65	0.06	0.00	0.00	0.00	187.56	0.00	-	0.00
2036_Forklift_Diesel	82,755	0.01	0.25	0.02	0.00	0.00	0.00	77.76	0.00	-	0.00
2036_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	631,983	0.51	1.57	0.31	0.02	0.02	0.01	594.09	0.02	-	0.02
2036_Rub-trd Gantry Crane_Diesel	55,041	0.02	0.08	0.02	0.00	0.00	0.00	51.73	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	384,716	0.10	0.55	0.13	0.01	0.01	0.00	361.50	0.01	-	0.01
2036_Rub-trd Gantry Crane_Diesel	82,712	0.02	0.11	0.03	0.00	0.00	0.00	77.72	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	16,853	0.00	0.02	0.01	0.00	0.00	0.00	15.84	0.00	-	0.00
2036_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2036_Top handler_Diesel	2,362,055	0.24	2.59	0.69	0.02	0.02	0.02	2,219.78	0.03	-	0.02
2036_Top handler_Diesel	2,263,034	0.84	3.69	0.83	0.04	0.04	0.02	2,129.49	0.08	-	0.04
2036_Top handler_Diesel	7,920,571	4.49	15.98	3.34	0.18	0.16	0.07	7,451.82	0.27	-	0.18
2036_Top handler_Diesel	969,128	0.10	1.07	0.29	0.01	0.01	0.01	909.84	0.01	-	0.01
2036_Top handler_Diesel	1,912,931	1.02	3.29	0.79	0.04	0.04	0.02	1,799.72	0.07	-	0.04
2036_Top handler_Diesel	718,214	0.39	1.24	0.30	0.02	0.01	0.01	675.71	0.02	-	0.02
2036_Truck_Diesel	231,021	0.03	0.28	0.07	0.00	0.00	0.00	217.07	0.01	-	0.00
2036_Truck_Diesel	333,457	0.05	0.40	0.10	0.00	0.00	0.00	313.33	0.01	-	0.00
2036_Truck_Diesel	142,332	0.03	0.18	0.05	0.00	0.00	0.00	133.75	0.00	-	0.00
2036_Yard tractor_LPG	7,844,878	1.42	224.81	2.48	0.10	0.09	-	5,835.75	0.44	-	-
2036_Yard tractor_LPG	10,685,221	1.97	311.67	3.38	0.13	0.12	-	7,948.66	0.52	-	-
2036_Yard tractor_LPG	9,143,315	0.95	137.93	2.73	0.10	0.09	-	6,801.65	0.27	-	-
2036_Yard tractor_LPG	3,550,265	0.27	36.41	1.04	0.04	0.03	-	2,641.02	0.11	-	-

Table B1-51. 2036 Proposed Mitigated Scenario Peak Day Emissions

2036		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Diesel	0.0040	0.07	1.18	0.10	0.00	0.00	0.00	287	0.01	-	0.00
2036_Forklift_Diesel	0.0040	0.17	5	0.48	0.02	0.02	0.02	1,519	0.03	-	0.02
2036_Forklift_Diesel	0.0040	0.05	2.03	0.19	0.01	0.01	0.01	629.77	0.01	-	0.01
2036_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	0.0040	4.11	12.71	2.49	0.15	0.13	0.05	4,811.38	0.17	-	0.15
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.14	0.69	0.16	0.01	0.01	0.00	418.93	0.02	-	0.01
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.82	4.43	1.06	0.05	0.04	0.03	2,927.68	0.11	-	0.05
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.14	0.88	0.22	0.01	0.01	0.01	629.46	0.02	-	0.01
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.02	0.16	0.04	0.00	0.00	0.00	128.25	0.00	-	0.00
2036_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Top handler_Diesel	0.0040	1.92	20.99	5.62	0.20	0.18	0.20	17,977.36	0.28	-	0.20
2036_Top handler_Diesel	0.0040	6.77	29.85	6.73	0.32	0.29	0.17	17,246.08	0.63	-	0.32
2036_Top handler_Diesel	0.0040	36.36	129.42	27.04	1.44	1.32	0.59	60,349.97	2.19	-	1.44
2036_Top handler_Diesel	0.0040	0.80	8.65	2.31	0.08	0.08	0.07	7,368.53	0.11	-	0.08
2036_Top handler_Diesel	0.0040	8.29	26.62	6.39	0.33	0.31	0.14	14,575.38	0.53	-	0.33
2036_Top handler_Diesel	0.0040	3.17	10.08	2.42	0.13	0.12	0.05	5,472.36	0.20	-	0.13
2036_Truck_Diesel	0.0040	0.28	2.24	0.58	0.02	0.02	0.02	1,757.98	0.06	-	0.02
2036_Truck_Diesel	0.0040	0.41	3.23	0.83	0.03	0.03	0.03	2,537.58	0.09	-	0.03
2036_Truck_Diesel	0.0040	0.23	1.50	0.37	0.02	0.01	0.01	1,083.22	0.04	-	0.02
2036_Yard tractor_LPG	0.0040	11.51	1,820.68	20.07	0.80	0.73	-	47,261.93	3.53	-	-
2036_Yard tractor_LPG	0.0040	15.93	2,524.11	27.40	1.09	1.00	-	64,373.74	4.25	-	-
2036_Yard tractor_LPG	0.0040	7.69	1,117.02	22.09	0.81	0.74	-	55,084.44	2.19	-	-
2036_Yard tractor_LPG	0.0040	2.19	294.89	8.40	0.30	0.27	-	21,388.78	0.85	-	-

8hr/24hr Peaking Factor*: 0.529716683
**Note: Using same peaking factor that is applied to trucks*

Table B1-52. 2036 Proposed Mitigated Scenario Eight Hour Peak Emissions

2036	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Diesel	0.03	0.63	0.05	0.00	0.00	0.00	151.99	0.01	0.00	0.00
2036_Forklift_Diesel	0.09	2.78	0.25	0.01	0.01	0.01	804.63	0.01	0.00	0.01
2036_Forklift_Diesel	0.02	1.08	0.10	0.00	0.00	0.00	333.60	0.00	0.00	0.00
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Diesel	2.18	6.73	1.32	0.08	0.07	0.03	2548.67	0.09	0.00	0.08
2036_Rub-trd Gantry Crane_Diesel	0.08	0.36	0.08	0.00	0.00	0.00	221.92	0.01	0.00	0.00
2036_Rub-trd Gantry Crane_Diesel	0.44	2.34	0.56	0.02	0.02	0.02	1550.84	0.06	0.00	0.02
2036_Rub-trd Gantry Crane_Diesel	0.08	0.47	0.12	0.00	0.00	0.00	333.43	0.01	0.00	0.00
2036_Rub-trd Gantry Crane_Diesel	0.01	0.08	0.02	0.00	0.00	0.00	67.94	0.00	0.00	0.00
2036_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Top handler_Diesel	1.02	11.12	2.98	0.11	0.10	0.11	9522.91	0.15	0.00	0.11
2036_Top handler_Diesel	3.59	15.81	3.57	0.17	0.16	0.09	9135.54	0.33	0.00	0.17
2036_Top handler_Diesel	19.26	68.56	14.32	0.76	0.70	0.31	31968.39	1.16	0.00	0.76
2036_Top handler_Diesel	0.43	4.58	1.22	0.04	0.04	0.04	3903.23	0.06	0.00	0.04
2036_Top handler_Diesel	4.39	14.10	3.39	0.18	0.16	0.08	7720.82	0.28	0.00	0.18
2036_Top handler_Diesel	1.68	5.34	1.28	0.07	0.06	0.03	2898.80	0.11	0.00	0.07
2036_Truck_Diesel	0.15	1.19	0.30	0.01	0.01	0.01	931.23	0.03	0.00	0.01
2036_Truck_Diesel	0.22	1.71	0.44	0.02	0.02	0.02	1344.20	0.05	0.00	0.02
2036_Truck_Diesel	0.12	0.79	0.20	0.01	0.01	0.01	573.80	0.02	0.00	0.01
2036_Yard tractor_LPG	6.10	964.45	10.63	0.42	0.39	0.00	25035.43	1.87	0.00	-
2036_Yard tractor_LPG	8.44	1337.06	14.51	0.58	0.53	0.00	34099.84	2.25	0.00	-
2036_Yard tractor_LPG	4.07	591.70	11.70	0.43	0.39	0.00	29179.15	1.16	0.00	-
2036_Yard tractor_LPG	1.16	156.21	4.45	0.16	0.14	0.00	11329.99	0.45	0.00	-

1hr/24hr Peaking Factor*: 0.073685169
Note: Using same peaking factor that is applied to trucks

Table B1-53. 2036 Proposed Mitigated Scenario One Hour Peak Emissions

2036	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Forklift_Diesel	0.00	0.09	0.01	0.00	0.00	0.00	21.14	0.00	0.00	0.00
2036_Forklift_Diesel	0.01	0.39	0.04	0.00	0.00	0.00	111.93	0.00	0.00	0.00
2036_Forklift_Diesel	0.00	0.15	0.01	0.00	0.00	0.00	46.40	0.00	0.00	0.00
2036_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Rub-trd Gantry Crane_Diesel	0.30	0.94	0.18	0.01	0.01	0.00	354.53	0.01	0.00	0.01
2036_Rub-trd Gantry Crane_Diesel	0.01	0.05	0.01	0.00	0.00	0.00	30.87	0.00	0.00	0.00
2036_Rub-trd Gantry Crane_Diesel	0.06	0.33	0.08	0.00	0.00	0.00	215.73	0.01	0.00	0.00
2036_Rub-trd Gantry Crane_Diesel	0.01	0.07	0.02	0.00	0.00	0.00	46.38	0.00	0.00	0.00
2036_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	9.45	0.00	0.00	0.00
2036_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2036_Top handler_Diesel	0.14	1.55	0.41	0.01	0.01	0.01	1324.66	0.02	0.00	0.01
2036_Top handler_Diesel	0.50	2.20	0.50	0.02	0.02	0.01	1270.78	0.05	0.00	0.02
2036_Top handler_Diesel	2.68	9.54	1.99	0.11	0.10	0.04	4446.90	0.16	0.00	0.11
2036_Top handler_Diesel	0.06	0.64	0.17	0.01	0.01	0.01	542.95	0.01	0.00	0.01
2036_Top handler_Diesel	0.61	1.96	0.47	0.02	0.02	0.01	1073.99	0.04	0.00	0.02
2036_Top handler_Diesel	0.23	0.74	0.18	0.01	0.01	0.00	403.23	0.01	0.00	0.01
2036_Truck_Diesel	0.02	0.17	0.04	0.00	0.00	0.00	129.54	0.00	0.00	0.00
2036_Truck_Diesel	0.03	0.24	0.06	0.00	0.00	0.00	186.98	0.01	0.00	0.00
2036_Truck_Diesel	0.02	0.11	0.03	0.00	0.00	0.00	79.82	0.00	0.00	0.00
2036_Yard tractor_LPG	0.85	134.16	1.48	0.06	0.05	0.00	3482.50	0.26	0.00	-
2036_Yard tractor_LPG	1.17	185.99	2.02	0.08	0.07	0.00	4743.39	0.31	0.00	-
2036_Yard tractor_LPG	0.57	82.31	1.63	0.06	0.05	0.00	4058.91	0.16	0.00	-
2036_Yard tractor_LPG	0.16	21.73	0.62	0.02	0.02	0.00	1576.04	0.06	0.00	-

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2045

Table B1-54. 2045 Proposed Mitigated Scenario - CHE Equipment List

Equipment	HP(WBCT)	MY (WBCT)	Fuel Type (WBCT)	Load Factor (WBCT)	Quantity (WBCT)	Control Type (WBCT)	% of Equipment Controlled (WBCT)	Operating Annual Hrs for CS
Electric Wharf Crane	0	0	Electric	#N/A	0		0%	-
Forklift	0	2036	Electric	0.3	2		0%	1,594
Forklift	0	2036	Electric	0.3	2		0%	417
Forklift	0	2036	Electric	0.3	2		0%	558
Forklift	0	2036	Electric	0.3	1		0%	412
Forklift	137	2037	Diesel	0.3	1		0%	917
Forklift	152	2035	Diesel	0.3	2		0%	4,377
Forklift	152	2036	Diesel	0.3	2		0%	1,815
Rub-trd Gantry Crane	0	0	Electric	0.2	0		0%	-
Rub-trd Gantry Crane	197	2023	Diesel	0.2	2		0%	2,099
Rub-trd Gantry Crane	197	2035	Diesel	0.2	1		0%	428
Rub-trd Gantry Crane	197	2039	Diesel	0.2	5		0%	16,040
Rub-trd Gantry Crane	197	2043	Diesel	0.2	5		0%	6,985
Rub-trd Gantry Crane	197	2045	Diesel	0.2	8		0%	9,764
Sweeper	100	2041	Diesel	0.68	0		0%	-
Top handler	250	2035	Diesel	0.59	8		0%	16,014
Top handler	260	2035	Diesel	0.59	3		0%	6,318
Top handler	260	2037	Diesel	0.59	8		0%	14,753
Top handler	260	2039	Diesel	0.59	15		0%	51,633
Top handler	335	2039	Diesel	0.59	3		0%	9,678
Top handler	370	2039	Diesel	0.59	1		0%	3,290
Truck	250	2041	Diesel	0.51	2		0%	1,812
Truck	250	2044	Diesel	0.51	2		0%	2,615
Truck	275	2038	Diesel	0.51	1		0%	1,015
Yard tractor	195	2035	LPG	0.39	43		0%	120,228
Yard tractor	195	2043	LPG	0.39	53		0%	103,154
Yard tractor	195	2044	LPG	0.39	59		0%	140,503
Yard tractor	231	2035	LPG	0.39	23		0%	39,408

Table B1-55. 2045 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2045_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-
2045_Forklift_Diesel	0.132	3.158	0.278	0.011	0.010	0.010	852.437	0.022	-
2045_Forklift_Diesel	0.283	4.036	0.319	0.016	0.015	0.010	852.427	0.029	-
2045_Forklift_Diesel	0.140	3.204	0.280	0.011	0.010	0.010	852.462	0.025	-
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	0.284	1.376	0.319	0.014	0.013	0.010	852.519	0.031	-
2045_Rub-trd Gantry Crane_Diesel	0.391	1.587	0.349	0.017	0.016	0.010	852.408	0.024	-
2045_Rub-trd Gantry Crane_Diesel	0.268	1.344	0.315	0.014	0.013	0.010	852.505	0.014	-
2045_Rub-trd Gantry Crane_Diesel	0.093	0.999	0.267	0.010	0.009	0.010	852.459	0.011	-
2045_Rub-trd Gantry Crane_Diesel	0.064	0.943	0.259	0.009	0.008	0.010	852.459	0.011	-
2045_Sweeper_Diesel	0.053	3.050	0.094	0.009	0.008	0.010	852.433	0.015	-
2045_Top handler_Diesel	0.264	1.336	0.314	0.014	0.013	0.010	852.652	0.023	-
2045_Top handler_Diesel	0.275	1.358	0.317	0.014	0.013	0.008	854.131	0.023	-
2045_Top handler_Diesel	0.212	1.234	0.300	0.013	0.012	0.008	852.724	0.018	-
2045_Top handler_Diesel	0.283	1.375	0.319	0.014	0.013	0.008	851.314	0.013	-
2045_Top handler_Diesel	0.269	1.240	0.315	0.014	0.013	0.008	851.314	0.013	-
2045_Top handler_Diesel	0.273	1.246	0.316	0.014	0.013	0.008	851.314	0.013	-
2045_Truck_Diesel	0.105	1.024	0.270	0.010	0.009	0.010	852.443	0.013	-
2045_Truck_Diesel	0.086	0.987	0.265	0.009	0.009	0.010	852.443	0.013	-
2045_Truck_Diesel	0.147	1.107	0.282	0.011	0.010	0.008	852.458	0.023	-
2045_Yard tractor_LPG	0.384	64.596	0.337	0.016	0.015	-	674.859	0.050	-
2045_Yard tractor_LPG	0.097	14.185	0.271	0.010	0.009	-	674.859	0.021	-
2045_Yard tractor_LPG	0.085	12.007	0.268	0.010	0.009	-	674.859	0.021	-
2045_Yard tractor_LPG	0.247	40.503	0.305	0.013	0.012	-	674.859	0.050	-

Table B1-56. 2045 Proposed Mitigated Scenario Annual Mass Emissions

2045		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2045_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Diesel	37,704	0.01	0.13	0.01	0.00	0.00	0.00	35.43	0.00	-	0.00
2045_Forklift_Diesel	199,607	0.06	0.89	0.07	0.00	0.00	0.00	187.56	0.01	-	0.00
2045_Forklift_Diesel	82,755	0.01	0.29	0.03	0.00	0.00	0.00	77.76	0.00	-	0.00
2045_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	82,712	0.03	0.13	0.03	0.00	0.00	0.00	77.73	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	16,853	0.01	0.03	0.01	0.00	0.00	0.00	15.83	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	631,983	0.19	0.94	0.22	0.01	0.01	0.01	593.88	0.01	-	0.01
2045_Rub-trd Gantry Crane_Diesel	275,207	0.03	0.30	0.08	0.00	0.00	0.00	258.60	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	384,716	0.03	0.40	0.11	0.00	0.00	0.00	361.50	0.00	-	0.00
2045_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2045_Top handler_Diesel	2,362,055	0.69	3.48	0.82	0.04	0.03	0.02	2,220.03	0.06	-	0.04
2045_Top handler_Diesel	969,128	0.29	1.45	0.34	0.02	0.01	0.01	912.44	0.02	-	0.02
2045_Top handler_Diesel	2,263,034	0.53	3.08	0.75	0.03	0.03	0.02	2,127.14	0.05	-	0.03
2045_Top handler_Diesel	7,920,571	2.47	12.01	2.79	0.13	0.12	0.07	7,432.64	0.11	-	0.13
2045_Top handler_Diesel	1,912,931	0.57	2.61	0.66	0.03	0.03	0.02	1,795.09	0.03	-	0.03
2045_Top handler_Diesel	718,214	0.22	0.99	0.25	0.01	0.01	0.01	673.97	0.01	-	0.01
2045_Truck_Diesel	231,021	0.03	0.26	0.07	0.00	0.00	0.00	217.08	0.00	-	0.00
2045_Truck_Diesel	333,457	0.03	0.36	0.10	0.00	0.00	0.00	313.33	0.00	-	0.00
2045_Truck_Diesel	142,332	0.02	0.17	0.04	0.00	0.00	0.00	133.74	0.00	-	0.00
2045_Yard tractor_LPG	9,143,315	3.88	651.04	3.39	0.16	0.15	-	6,801.65	0.51	-	-
2045_Yard tractor_LPG	7,844,878	0.84	122.66	2.35	0.09	0.08	-	5,835.75	0.18	-	-
2045_Yard tractor_LPG	10,685,221	1.00	141.43	3.16	0.11	0.10	-	7,948.66	0.25	-	-
2045_Yard tractor_LPG	3,550,265	0.97	158.51	1.20	0.05	0.05	-	2,641.02	0.20	-	-

Table B1-57. 2045 Proposed Mitigated Scenario Peak Day Emissions

2045		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Diesel	0.0040	0.04	1.06	0.09	0.00	0.00	0.00	287	0.01	-	0.00
2045_Forklift_Diesel	0.0040	0.50	7	0.57	0.03	0.03	0.02	1,519	0.05	-	0.03
2045_Forklift_Diesel	0.0040	0.10	2.37	0.21	0.01	0.01	0.01	629.77	0.02	-	0.01
2045_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.21	1.02	0.24	0.01	0.01	0.01	629.49	0.02	-	0.01
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.06	0.24	0.05	0.00	0.00	0.00	128.24	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	0.0040	1.51	7.58	1.78	0.08	0.07	0.05	4,809.66	0.08	-	0.08
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.23	2.45	0.66	0.02	0.02	0.02	2,094.33	0.03	-	0.02
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.22	3.24	0.89	0.03	0.03	0.03	2,927.69	0.04	-	0.03
2045_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Top handler_Diesel	0.0040	5.56	28.17	6.62	0.29	0.27	0.20	17,979.33	0.49	-	0.29
2045_Top handler_Diesel	0.0040	2.37	11.75	2.74	0.12	0.11	0.07	7,389.54	0.20	-	0.12
2045_Top handler_Diesel	0.0040	4.27	24.92	6.05	0.25	0.23	0.17	17,227.06	0.37	-	0.25
2045_Top handler_Diesel	0.0040	20.04	97.24	22.57	1.02	0.94	0.59	60,194.66	0.93	-	1.02
2045_Top handler_Diesel	0.0040	4.59	21.17	5.38	0.24	0.22	0.14	14,537.87	0.22	-	0.24
2045_Top handler_Diesel	0.0040	1.75	7.99	2.03	0.09	0.08	0.05	5,458.27	0.08	-	0.09
2045_Truck_Diesel	0.0040	0.22	2.11	0.56	0.02	0.02	0.02	1,758.04	0.03	-	0.02
2045_Truck_Diesel	0.0040	0.26	2.94	0.79	0.03	0.03	0.03	2,537.56	0.04	-	0.03
2045_Truck_Diesel	0.0040	0.19	1.41	0.36	0.01	0.01	0.01	1,083.15	0.03	-	0.01
2045_Yard tractor_LPG	0.0040	31.38	5,272.59	27.48	1.31	1.21	-	55,084.44	4.12	-	-
2045_Yard tractor_LPG	0.0040	6.80	993.38	19.00	0.70	0.64	-	47,261.93	1.47	-	-
2045_Yard tractor_LPG	0.0040	8.07	1,145.36	25.61	0.92	0.85	-	64,373.74	2.00	-	-
2045_Yard tractor_LPG	0.0040	7.83	1,283.69	9.68	0.42	0.38	-	21,388.78	1.60	-	-

8hr/24hr Peaking Factor*: 0.529716683

**Note: Using same peaking factor that is applied to trucks*

Table B1-58. 2045 Proposed Mitigated Scenario Eight Hour Peak Emissions

2045	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Diesel	0.02	0.56	0.05	0.00	0.00	0.00	151.98	0.00	0.00	0.00
2045_Forklift_Diesel	0.27	3.81	0.30	0.02	0.01	0.01	804.62	0.03	0.00	0.02
2045_Forklift_Diesel	0.05	1.25	0.11	0.00	0.00	0.00	333.60	0.01	0.00	0.00
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Diesel	0.11	0.54	0.12	0.01	0.01	0.00	333.45	0.01	0.00	0.01
2045_Rub-trd Gantry Crane_Diesel	0.03	0.13	0.03	0.00	0.00	0.00	67.93	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Diesel	0.80	4.02	0.94	0.04	0.04	0.03	2547.76	0.04	0.00	0.04
2045_Rub-trd Gantry Crane_Diesel	0.12	1.30	0.35	0.01	0.01	0.01	1109.40	0.01	0.00	0.01
2045_Rub-trd Gantry Crane_Diesel	0.12	1.72	0.47	0.02	0.01	0.02	1550.85	0.02	0.00	0.02
2045_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Top handler_Diesel	2.94	14.92	3.50	0.16	0.14	0.11	9523.95	0.26	0.00	0.16
2045_Top handler_Diesel	1.26	6.22	1.45	0.07	0.06	0.04	3914.36	0.11	0.00	0.07
2045_Top handler_Diesel	2.26	13.20	3.21	0.13	0.12	0.09	9125.46	0.19	0.00	0.13
2045_Top handler_Diesel	10.62	51.51	11.95	0.54	0.50	0.31	31886.12	0.49	0.00	0.54
2045_Top handler_Diesel	2.43	11.21	2.85	0.13	0.12	0.08	7700.95	0.12	0.00	0.13
2045_Top handler_Diesel	0.93	4.23	1.07	0.05	0.04	0.03	2891.34	0.04	0.00	0.05
2045_Truck_Diesel	0.12	1.12	0.30	0.01	0.01	0.01	931.26	0.01	0.00	0.01
2045_Truck_Diesel	0.14	1.56	0.42	0.01	0.01	0.02	1344.19	0.02	0.00	0.01
2045_Truck_Diesel	0.10	0.74	0.19	0.01	0.01	0.01	573.76	0.02	0.00	0.01
2045_Yard tractor_LPG	16.62	2792.98	14.56	0.69	0.64	0.00	29179.15	2.18	0.00	-
2045_Yard tractor_LPG	3.60	526.21	10.06	0.37	0.34	0.00	25035.43	0.78	0.00	-
2045_Yard tractor_LPG	4.28	606.72	13.56	0.49	0.45	0.00	34099.84	1.06	0.00	-
2045_Yard tractor_LPG	4.15	679.99	5.13	0.22	0.20	0.00	11329.99	0.85	0.00	-

1hr/24hr Peaking Factor*: 0.073685169

**Note: Using same peaking factor that is applied to trucks*

Table B1-59. 2045 Proposed Mitigated Scenario One Hour Peak Emissions

2045	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Electric Wharf Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Forklift_Diesel	0.00	0.08	0.01	0.00	0.00	0.00	21.14	0.00	0.00	0.00
2045_Forklift_Diesel	0.04	0.53	0.04	0.00	0.00	0.00	111.92	0.00	0.00	0.00
2045_Forklift_Diesel	0.01	0.17	0.02	0.00	0.00	0.00	46.40	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Electric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Rub-trd Gantry Crane_Diesel	0.02	0.07	0.02	0.00	0.00	0.00	46.38	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Diesel	0.00	0.02	0.00	0.00	0.00	0.00	9.45	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Diesel	0.11	0.56	0.13	0.01	0.01	0.00	354.40	0.01	0.00	0.01
2045_Rub-trd Gantry Crane_Diesel	0.02	0.18	0.05	0.00	0.00	0.00	154.32	0.00	0.00	0.00
2045_Rub-trd Gantry Crane_Diesel	0.02	0.24	0.07	0.00	0.00	0.00	215.73	0.00	0.00	0.00
2045_Sweeper_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
2045_Top handler_Diesel	0.41	2.08	0.49	0.02	0.02	0.01	1324.81	0.04	0.00	0.02
2045_Top handler_Diesel	0.17	0.87	0.20	0.01	0.01	0.01	544.50	0.01	0.00	0.01
2045_Top handler_Diesel	0.32	1.84	0.45	0.02	0.02	0.01	1269.38	0.03	0.00	0.02
2045_Top handler_Diesel	1.48	7.16	1.66	0.08	0.07	0.04	4435.45	0.07	0.00	0.08
2045_Top handler_Diesel	0.34	1.56	0.40	0.02	0.02	0.01	1071.23	0.02	0.00	0.02
2045_Top handler_Diesel	0.13	0.59	0.15	0.01	0.01	0.00	402.19	0.01	0.00	0.01
2045_Truck_Diesel	0.02	0.16	0.04	0.00	0.00	0.00	129.54	0.00	0.00	0.00
2045_Truck_Diesel	0.02	0.22	0.06	0.00	0.00	0.00	186.98	0.00	0.00	0.00
2045_Truck_Diesel	0.01	0.10	0.03	0.00	0.00	0.00	79.81	0.00	0.00	0.00
2045_Yard tractor_LPG	2.31	388.51	2.02	0.10	0.09	0.00	4058.91	0.30	0.00	-
2045_Yard tractor_LPG	0.50	73.20	1.40	0.05	0.05	0.00	3482.50	0.11	0.00	-
2045_Yard tractor_LPG	0.59	84.40	1.89	0.07	0.06	0.00	4743.39	0.15	0.00	-
2045_Yard tractor_LPG	0.58	94.59	0.71	0.03	0.03	0.00	1576.04	0.12	0.00	-

Ocean-Going Vessels (OGVs)

Table B1-60. Ocean Going Vessel Criteria Pollutant Emission Factors by Tier Level for Main Engine and Boilers

Main Engine, Gas Turbine and Boilers	IMO Tier	Model Year	PM10	PM2.5	DPM	NOx	SOx	CO	HC
			gm/kw-hr	gm/kw-hr	gm/kw-hr	gm/kw-hr	gm/kw-hr	gm/kw-hr	gm/kw-hr
MDO/MGO 0.1% Sulfur									
Slow speed diesel	Tier 0	≤ 1999	0.26	0.24	0.26	17.0	0.39	1.4	0.6
Medium speed diesel	Tier 0	≤ 1999	0.26	0.24	0.26	13.2	0.43	1.1	0.5
Slow speed diesel	Tier 1	2000 – 2010	0.26	0.24	0.26	16.0	0.39	1.4	0.6
Medium speed diesel	Tier 1	2000 – 2010	0.26	0.24	0.26	12.2	0.43	1.1	0.5
Slow speed diesel	Tier 2	2011 – 2015	0.26	0.24	0.26	14.4	0.39	1.4	0.6
Medium speed diesel	Tier 2	2011 – 2015	0.26	0.24	0.26	10.5	0.43	1.1	0.5
Slow speed diesel	Tier 3	≥ 2016	0.26	0.24	0.26	3.4	0.39	1.4	0.6
Medium speed diesel	Tier 3	≥ 2016	0.26	0.24	0.26	2.6	0.43	1.1	0.5
Gas turbine	na	all	0.01	0.01	0.00	5.7	0.61	0.2	0.1
Steamship	na	all	0.14	0.13	0.00	2.0	0.61	0.2	0.1
MDO/MGO 0.08% Sulfur									
Slow speed diesel	Tier 0	≤ 1999	0.255	0.228	0.255	17.0	0.315	1.4	0.6
Medium speed diesel	Tier 0	≤ 1999	0.255	0.228	0.255	13.2	0.345	1.1	0.5
Slow speed diesel	Tier 1	2000 – 2010	0.255	0.228	0.255	16.0	0.315	1.4	0.6
Medium speed diesel	Tier 1	2000 – 2010	0.255	0.228	0.255	12.2	0.345	1.1	0.5
Slow speed diesel	Tier 2	2011 – 2015	0.255	0.228	0.255	14.4	0.315	1.4	0.6
Medium speed diesel	Tier 2	2011 – 2015	0.255	0.228	0.255	10.5	0.345	1.1	0.5
Slow speed diesel	Tier 3	≥ 2016	0.255	0.228	0.255	3.4	0.315	1.4	0.6
Medium speed diesel	Tier 3	≥ 2016	0.255	0.228	0.255	2.6	0.345	1.1	0.5
Gas turbine	na	all	0.01	0.01	0.000	5.7	0.495	0.2	0.1
Steamship	na	all	0.14	0.12	0.000	2.0	0.495	0.2	0.1
MDO/MGO 0.05% Sulfur									
Slow speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	17.0	0.200	1.4	0.6
Medium speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	13.2	0.220	1.1	0.5
Slow speed diesel	Tier 1	2000 – 2010	0.240	0.216	0.240	16.0	0.200	1.4	0.6
Medium speed diesel	Tier 1	2000 – 2010	0.240	0.216	0.240	12.2	0.220	1.1	0.5
Slow speed diesel	Tier 2	2011 – 2015	0.240	0.216	0.240	14.4	0.200	1.4	0.6
Medium speed diesel	Tier 2	2011 – 2015	0.240	0.216	0.240	10.5	0.220	1.1	0.5
Slow speed diesel	Tier 3	≥ 2016	0.240	0.216	0.240	3.4	0.200	1.4	0.6
Medium speed diesel	Tier 3	≥ 2016	0.240	0.216	0.240	2.6	0.220	1.1	0.5
Gas turbine	na	all	0.008	0.007	0.000	5.7	0.310	0.2	0.1
Steamship	na	all	0.128	0.115	0.000	2.0	0.310	0.2	0.1
MDO/MGO 0.04% Sulfur									
Slow speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	17.0	0.160	1.4	0.6
Medium speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	13.2	0.170	1.1	0.5
Slow speed diesel	Tier 1	2000 – 2010	0.240	0.216	0.240	16.0	0.160	1.4	0.6
Medium speed diesel	Tier 1	2000 – 2010	0.240	0.216	0.240	12.2	0.170	1.1	0.5
Slow speed diesel	Tier 2	2011 – 2015	0.240	0.216	0.240	14.4	0.160	1.4	0.6
Medium speed diesel	Tier 2	2011 – 2015	0.240	0.216	0.240	10.5	0.170	1.1	0.5
Slow speed diesel	Tier 3	≥ 2016	0.240	0.216	0.240	3.4	0.160	1.4	0.6
Medium speed diesel	Tier 3	≥ 2016	0.240	0.216	0.240	2.6	0.170	1.1	0.5
Gas turbine	na	all	0.008	0.007	0.000	5.7	0.250	0.2	0.1
Steamship	na	all	0.128	0.115	0.000	2.0	0.250	0.2	0.1
MDO/MGO 0.03% Sulfur									
Slow speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	17.0	0.116	1.4	0.6
Medium speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	13.2	0.127	1.1	0.5
Slow speed diesel	Tier 1	2000 – 2010	0.240	0.216	0.240	16.0	0.116	1.4	0.6
Medium speed diesel	Tier 1	2000 – 2010	0.240	0.216	0.240	12.2	0.127	1.1	0.5
Slow speed diesel	Tier 2	2011 – 2015	0.240	0.216	0.240	14.4	0.116	1.4	0.6
Medium speed diesel	Tier 2	2011 – 2015	0.240	0.216	0.240	10.5	0.127	1.1	0.5
Slow speed diesel	Tier 3	≥ 2016	0.240	0.216	0.240	3.4	0.116	1.4	0.6
Medium speed diesel	Tier 3	≥ 2016	0.240	0.216	0.240	2.6	0.127	1.1	0.5
Gas turbine	na	all	0.008	0.01	0.000	5.7	0.182	0.2	0.1
Steamship	na	all	0.128	0.12	0.000	2.0	0.182	0.2	0.1

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-62. Ocean Going Vessel Greenhouse Gas Emission Factors by Tier Level for Main Engine and Boilers

Main Engine, Gas Turbine and Boilers	IMO Tier	Model Year	CO2	N2O	CH4
			gm/kw-hr	gm/kw-hr	gm/kw-hr
MDO/MGO 0.1%, 0.05%, 0.04% and 0.03% Sulfur					
Slow speed diesel	Tier 0	≤ 1999	589	0.029	0.012
Medium speed diesel	Tier 0	≤ 1999	649	0.029	0.01
Slow speed diesel	Tier 1	2000 – 2010	589	0.029	0.012
Medium speed diesel	Tier 1	2000 – 2010	649	0.029	0.01
Slow speed diesel	Tier 2	2011 – 2015	589	0.029	0.012
Medium speed diesel	Tier 2	2011 – 2015	649	0.029	0.01
Slow speed diesel	Tier 3	≥ 2016	589	0.029	0.012
Medium speed diesel	Tier 3	≥ 2016	649	0.029	0.01
Gas turbine	na	all	922	0.075	0.002
Steamship	na	all	922	0.075	0.002

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-62. Ocean Going Vessel Criteria Greenhouse Gas Emission Factors by Tier Level for Main Engine and Boilers

Auxiliary Engine	IMO Tier	Model Year	PM10 gm/kw-hr	PM2.5 gm/kw-hr	DPM gm/kw-hr	NOx gm/kw-hr	SOx gm/kw-hr	CO gm/kw-hr	HC gm/kw-hr
MDO/MGO 0.1% Sulfur									
High speed diesel	Tier 0	≤ 1999	0.26	0.24	0.26	10.90	0.46	0.90	0.40
Medium speed diesel	Tier 0	≤ 1999	0.26	0.24	0.26	13.80	0.46	1.10	0.40
High speed diesel	Tier 1	2000 – 2010	0.26	0.24	0.26	9.80	0.46	0.90	0.40
Medium speed diesel	Tier 1	2000 – 2010	0.26	0.24	0.26	12.20	0.46	1.10	0.40
High speed diesel	Tier 2	2011 – 2015	0.26	0.24	0.26	7.70	0.46	0.90	0.40
Medium speed diesel	Tier 2	2011 – 2015	0.26	0.24	0.26	10.50	0.46	1.10	0.40
High speed diesel	Tier 3	≥ 2016	0.26	0.24	0.26	2.00	0.46	0.90	0.40
Medium speed diesel	Tier 3	≥ 2016	0.26	0.24	0.26	2.60	0.46	1.10	0.40
MDO/MGO 0.08% Sulfur									
High speed diesel	Tier 0	≤ 1999	0.255	0.228	0.255	10.9	0.369	0.9	0.4
Medium speed diesel	Tier 0	≤ 1999	0.255	0.228	0.255	13.8	0.369	1.1	0.4
High speed diesel	Tier 1	2000 – 2010	0.255	0.228	0.255	9.8	0.369	0.9	0.4
Medium speed diesel	Tier 1	2000 – 2010	0.255	0.228	0.255	12.2	0.369	1.1	0.4
High speed diesel	Tier 2	2011 – 2015	0.255	0.228	0.255	7.7	0.369	0.9	0.4
Medium speed diesel	Tier 2	2011 – 2015	0.255	0.228	0.255	10.5	0.369	1.1	0.4
High speed diesel	Tier 3	≥ 2016	0.255	0.228	0.255	2.0	0.369	0.9	0.4
Medium speed diesel	Tier 3	≥ 2016	0.255	0.228	0.255	2.6	0.369	1.1	0.4
MDO/MGO 0.05% Sulfur									
High speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	10.9	0.234	0.9	0.4
Medium speed diesel	Tier 0	≤ 1999	0.24	0.216	0.240	13.8	0.234	1.1	0.4
High speed diesel	Tier 1	2000 – 2010	0.24	0.216	0.240	9.8	0.234	0.9	0.4
Medium speed diesel	Tier 1	2000 – 2010	0.24	0.216	0.240	12.2	0.234	1.1	0.4
High speed diesel	Tier 2	2011 – 2015	0.24	0.216	0.240	7.7	0.234	0.9	0.4
Medium speed diesel	Tier 2	2011 – 2015	0.24	0.216	0.240	10.5	0.234	1.1	0.4
High speed diesel	Tier 3	≥ 2016	0.24	0.216	0.240	2.0	0.234	0.9	0.4
Medium speed diesel	Tier 3	≥ 2016	0.24	0.216	0.240	2.6	0.234	1.1	0.4
MDO/MGO 0.04% Sulfur									
High speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	10.9	0.185	0.9	0.4
Medium speed diesel	Tier 0	≤ 1999	0.24	0.216	0.240	13.8	0.185	1.1	0.4
High speed diesel	Tier 1	2000 – 2010	0.24	0.216	0.240	9.8	0.185	0.9	0.4
Medium speed diesel	Tier 1	2000 – 2010	0.24	0.216	0.240	12.2	0.185	1.1	0.4
High speed diesel	Tier 2	2011 – 2015	0.24	0.216	0.240	7.7	0.185	0.9	0.4
Medium speed diesel	Tier 2	2011 – 2015	0.24	0.216	0.240	10.5	0.185	1.1	0.4
High speed diesel	Tier 3	≥ 2016	0.24	0.216	0.240	2.0	0.185	0.9	0.4
Medium speed diesel	Tier 3	≥ 2016	0.24	0.216	0.240	2.6	0.185	1.1	0.4
MDO/MGO 0.03% Sulfur									
High speed diesel	Tier 0	≤ 1999	0.240	0.216	0.240	10.9	0.135	0.9	0.4
Medium speed diesel	Tier 0	≤ 1999	0.24	0.216	0.240	13.8	0.135	1.1	0.4
High speed diesel	Tier 1	2000 – 2010	0.24	0.216	0.240	9.8	0.135	0.9	0.4
Medium speed diesel	Tier 1	2000 – 2010	0.24	0.216	0.240	12.2	0.135	1.1	0.4
High speed diesel	Tier 2	2011 – 2015	0.24	0.216	0.240	7.7	0.135	0.9	0.4
Medium speed diesel	Tier 2	2011 – 2015	0.24	0.216	0.240	10.5	0.135	1.1	0.4
High speed diesel	Tier 3	≥ 2016	0.24	0.216	0.240	2.0	0.135	0.9	0.4
Medium speed diesel	Tier 3	≥ 2016	0.24	0.216	0.240	2.6	0.135	1.1	0.4

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-63. Ocean Going Vessel Greenhouse Gas Emission Factors by Tier Level for Auxiliary Engines

Auxiliary Engine	IMO Tier	Model Year	CO2	N2O	CH4
			gm/kw-hr	gm/kw-hr	gm/kw-hr
MDO/MGO 0.1%, 0.05%, 0.04% and 0.03% Sulfur					
High speed diesel	Tier 0	≤ 1999	656	0.029	0.008
Medium speed diesel	Tier 0	≤ 1999	686	0.029	0.008
High speed diesel	Tier 1	2000 – 2010	656	0.029	0.008
Medium speed diesel	Tier 1	2000 – 2010	686	0.029	0.008
High speed diesel	Tier 2	2011 – 2015	656	0.029	0.008
Medium speed diesel	Tier 2	2011 – 2015	686	0.029	0.008
High speed diesel	Tier 3	≥ 2016	656	0.029	0.008
Medium speed diesel	Tier 3	≥ 2016	686	0.029	0.008

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-64. Emission Rates Adjustment Factors for MAN Propulsion Engine without Slide Valves

MAN Engines without Slide Valves										
Load	PM	PM2.5	DPM	NOx	SOx	HC	CO	CH4	CO2	N2O
2%	0.83	0.83	0.83	1.86	1.00	2.45	1.36	2.45	1.00	1.86
3%	0.83	0.83	0.83	1.82	1.00	2.37	1.34	2.37	1.00	1.82
4%	0.82	0.82	0.82	1.77	1.00	2.30	1.33	2.30	1.00	1.77
5%	0.82	0.82	0.82	1.72	1.00	2.23	1.31	2.23	1.00	1.72
6%	0.81	0.81	0.81	1.68	1.00	2.16	1.29	2.16	1.00	1.68
7%	0.81	0.81	0.81	1.64	1.00	2.10	1.28	2.10	1.00	1.64
8%	0.80	0.80	0.80	1.60	1.00	2.03	1.26	2.03	1.00	1.60
9%	0.80	0.80	0.80	1.56	1.00	1.97	1.25	1.97	1.00	1.56
10%	0.79	0.79	0.79	1.52	1.00	1.91	1.24	1.91	1.00	1.52
11%	0.79	0.79	0.79	1.49	1.00	1.86	1.22	1.86	1.00	1.49
12%	0.78	0.78	0.78	1.45	1.00	1.80	1.21	1.80	1.00	1.45
13%	0.78	0.78	0.78	1.42	1.00	1.75	1.20	1.75	1.00	1.42
14%	0.78	0.78	0.78	1.39	1.00	1.70	1.19	1.70	1.00	1.39
15%	0.77	0.77	0.77	1.36	1.00	1.65	1.18	1.65	1.00	1.36
16%	0.77	0.77	0.77	1.33	1.00	1.61	1.17	1.61	1.00	1.33
17%	0.77	0.77	0.77	1.30	1.00	1.56	1.16	1.56	1.00	1.30
18%	0.77	0.77	0.77	1.28	1.00	1.52	1.15	1.52	1.00	1.28
19%	0.76	0.76	0.76	1.25	1.00	1.48	1.14	1.48	1.00	1.25
20%	0.76	0.76	0.76	1.23	1.00	1.44	1.13	1.44	1.00	1.23
21%	0.76	0.76	0.76	1.20	1.00	1.41	1.13	1.41	1.00	1.20
22%	0.76	0.76	0.76	1.18	1.00	1.37	1.12	1.37	1.00	1.18
23%	0.76	0.76	0.76	1.16	1.00	1.34	1.11	1.34	1.00	1.16
24%	0.75	0.75	0.75	1.14	1.00	1.31	1.10	1.31	1.00	1.14
25%	0.75	0.75	0.75	1.12	1.00	1.28	1.10	1.28	1.00	1.12
26%	0.75	0.75	0.75	1.11	1.00	1.25	1.09	1.25	1.00	1.11
27%	0.75	0.75	0.75	1.09	1.00	1.22	1.08	1.22	1.00	1.09
28%	0.75	0.75	0.75	1.07	1.00	1.20	1.08	1.20	1.00	1.07
29%	0.75	0.75	0.75	1.06	1.00	1.17	1.07	1.17	1.00	1.06
30%	0.75	0.75	0.75	1.05	1.00	1.15	1.07	1.15	1.00	1.05
31%	0.75	0.75	0.75	1.03	1.00	1.13	1.06	1.13	1.00	1.03
32%	0.75	0.75	0.75	1.02	1.00	1.11	1.06	1.11	1.00	1.02
33%	0.75	0.75	0.75	1.01	1.00	1.09	1.05	1.09	1.00	1.01
34%	0.75	0.75	0.75	1.00	1.00	1.08	1.05	1.08	1.00	1.00
35%	0.76	0.76	0.76	0.99	1.00	1.06	1.04	1.06	1.00	0.99
36%	0.76	0.76	0.76	0.98	1.00	1.05	1.04	1.05	1.00	0.98
37%	0.76	0.76	0.76	0.98	1.00	1.04	1.03	1.04	1.00	0.98
38%	0.76	0.76	0.76	0.97	1.00	1.02	1.03	1.02	1.00	0.97
39%	0.76	0.76	0.76	0.96	1.00	1.01	1.02	1.01	1.00	0.96
40%	0.76	0.76	0.76	0.96	1.00	1.00	1.02	1.00	1.00	0.96
41%	0.77	0.77	0.77	0.95	1.00	0.99	1.01	0.99	1.00	0.95
42%	0.77	0.77	0.77	0.95	1.00	0.99	1.01	0.99	1.00	0.95
43%	0.77	0.77	0.77	0.94	1.00	0.98	1.01	0.98	1.00	0.94
44%	0.78	0.78	0.78	0.94	1.00	0.97	1.00	0.97	1.00	0.94
45%	0.78	0.78	0.78	0.94	1.00	0.97	1.00	0.97	1.00	0.94
46%	0.78	0.78	0.78	0.94	1.00	0.96	0.99	0.96	1.00	0.94
47%	0.79	0.79	0.79	0.94	1.00	0.96	0.99	0.96	1.00	0.94
48%	0.79	0.79	0.79	0.93	1.00	0.96	0.98	0.96	1.00	0.93
49%	0.79	0.79	0.79	0.93	1.00	0.96	0.98	0.96	1.00	0.93
50%	0.80	0.80	0.80	0.93	1.00	0.96	0.98	0.96	1.00	0.93
51%	0.80	0.80	0.80	0.94	1.00	0.95	0.97	0.95	1.00	0.94
52%	0.81	0.81	0.81	0.94	1.00	0.95	0.97	0.95	1.00	0.94
53%	0.81	0.81	0.81	0.94	1.00	0.95	0.96	0.95	1.00	0.94
54%	0.82	0.82	0.82	0.94	1.00	0.95	0.96	0.95	1.00	0.94
55%	0.82	0.82	0.82	0.94	1.00	0.96	0.96	0.96	1.00	0.94
56%	0.83	0.83	0.83	0.94	1.00	0.96	0.95	0.96	1.00	0.94
57%	0.84	0.84	0.84	0.95	1.00	0.96	0.95	0.96	1.00	0.95
58%	0.84	0.84	0.84	0.95	1.00	0.96	0.95	0.96	1.00	0.95
59%	0.85	0.85	0.85	0.95	1.00	0.96	0.94	0.96	1.00	0.95
60%	0.86	0.86	0.86	0.95	1.00	0.97	0.94	0.97	1.00	0.95
61%	0.86	0.86	0.86	0.96	1.00	0.97	0.93	0.97	1.00	0.96
62%	0.87	0.87	0.87	0.96	1.00	0.97	0.93	0.97	1.00	0.96
63%	0.88	0.88	0.88	0.96	1.00	0.98	0.93	0.98	1.00	0.96
64%	0.89	0.89	0.89	0.97	1.00	0.98	0.93	0.98	1.00	0.97
65%	0.89	0.89	0.89	0.97	1.00	0.98	0.92	0.98	1.00	0.97
66%	0.90	0.90	0.90	0.98	1.00	0.99	0.92	0.99	1.00	0.98
67%	0.91	0.91	0.91	0.98	1.00	0.99	0.92	0.99	1.00	0.98
68%	0.92	0.92	0.92	0.98	1.00	0.99	0.91	0.99	1.00	0.98
69%	0.93	0.93	0.93	0.99	1.00	1.00	0.91	1.00	1.00	0.99
70%	0.94	0.94	0.94	0.99	1.00	1.00	0.91	1.00	1.00	0.99
71%	0.94	0.94	0.94	0.99	1.00	1.00	0.91	1.00	1.00	0.99
72%	0.95	0.95	0.95	1.00	1.00	1.01	0.91	1.01	1.00	1.00
73%	0.96	0.96	0.96	1.00	1.00	1.01	0.91	1.01	1.00	1.00
74%	0.97	0.97	0.97	1.00	1.00	1.01	0.91	1.01	1.00	1.00
75%	0.98	0.98	0.98	1.01	1.00	1.01	0.90	1.01	1.00	1.01
76%	0.99	0.99	0.99	1.01	1.00	1.01	0.90	1.01	1.00	1.01
77%	1.00	1.00	1.00	1.01	1.00	1.01	0.90	1.01	1.00	1.01
78%	1.01	1.01	1.01	1.01	1.00	1.01	0.91	1.01	1.00	1.01
79%	1.03	1.03	1.03	1.02	1.00	1.01	0.91	1.01	1.00	1.02
80%	1.04	1.04	1.04	1.02	1.00	1.01	0.91	1.01	1.00	1.02
81%	1.05	1.05	1.05	1.02	1.00	1.01	0.91	1.01	1.00	1.02
82%	1.06	1.06	1.06	1.02	1.00	1.01	0.91	1.01	1.00	1.02
83%	1.07	1.07	1.07	1.02	1.00	1.01	0.92	1.01	1.00	1.02
84%	1.08	1.08	1.08	1.02	1.00	1.00	0.92	1.00	1.00	1.02
85%	1.10	1.10	1.10	1.02	1.00	1.00	0.92	1.00	1.00	1.02
86%	1.11	1.11	1.11	1.02	1.00	0.99	0.93	0.99	1.00	1.02
87%	1.12	1.12	1.12	1.02	1.00	0.99	0.93	0.99	1.00	1.02
88%	1.13	1.13	1.13	1.02	1.00	0.98	0.94	0.98	1.00	1.02
89%	1.15	1.15	1.15	1.01	1.00	0.97	0.95	0.97	1.00	1.01
90%	1.16	1.16	1.16	1.01	1.00	0.97	0.95	0.97	1.00	1.01
91%	1.17	1.17	1.17	1.01	1.00	0.96	0.96	0.96	1.00	1.01
92%	1.19	1.19	1.19	1.00	1.00	0.94	0.97	0.94	1.00	1.00
93%	1.20	1.20	1.20	1.00	1.00	0.93	0.98	0.93	1.00	1.00
94%	1.22	1.22	1.22	0.99	1.00	0.92	0.99	0.92	1.00	0.99
95%	1.23	1.23	1.23	0.99	1.00	0.91	1.01	0.91	1.00	0.99
96%	1.24	1.24	1.24	0.98	1.00	0.89	1.02	0.89	1.00	0.98
97%	1.26	1.26	1.26	0.97	1.00	0.87	1.03	0.87	1.00	0.97
98%	1.28	1.28	1.28	0.97	1.00	0.86	1.05	0.86	1.00	0.97
99%	1.29	1.29	1.29	0.96	1.00	0.84	1.07	0.84	1.00	0.96
100%	1.31	1.31	1.31	0.95	1.00	0.82	1.08	0.82	1.00	0.95

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-65. Emission Rates Adjustment Factors for MAN Propulsion Engine with Slide Valves

MAN Engines with Slide Valves										
Load	PM	PM2.5	DPM	NOx	SOx	HC	CO	CH4	CO2	N2O
2%	0.37	0.37	0.37	1.86	1.00	1.32	0.12	1.32	1.00	1.86
3%	0.38	0.38	0.38	1.82	1.00	1.28	0.12	1.28	1.00	1.82
4%	0.38	0.38	0.38	1.78	1.00	1.24	0.12	1.24	1.00	1.78
5%	0.39	0.39	0.39	1.74	1.00	1.20	0.12	1.20	1.00	1.74
6%	0.40	0.40	0.40	1.70	1.00	1.17	0.12	1.17	1.00	1.70
7%	0.41	0.41	0.41	1.67	1.00	1.14	0.12	1.14	1.00	1.67
8%	0.41	0.41	0.41	1.63	1.00	1.11	0.12	1.11	1.00	1.63
9%	0.42	0.42	0.42	1.60	1.00	1.08	0.12	1.08	1.00	1.60
10%	0.43	0.43	0.43	1.57	1.00	1.05	0.12	1.05	1.00	1.57
11%	0.44	0.44	0.44	1.53	1.00	1.02	0.26	1.02	1.00	1.53
12%	0.45	0.45	0.45	1.50	1.00	0.99	0.39	0.99	1.00	1.50
13%	0.45	0.45	0.45	1.47	1.00	0.97	0.52	0.97	1.00	1.47
14%	0.46	0.46	0.46	1.45	1.00	0.94	0.64	0.94	1.00	1.45
15%	0.47	0.47	0.47	1.42	1.00	0.92	0.75	0.92	1.00	1.42
16%	0.48	0.48	0.48	1.39	1.00	0.90	0.85	0.90	1.00	1.39
17%	0.49	0.49	0.49	1.37	1.00	0.88	0.95	0.88	1.00	1.37
18%	0.49	0.49	0.49	1.34	1.00	0.86	1.04	0.86	1.00	1.34
19%	0.50	0.50	0.50	1.32	1.00	0.84	1.12	0.84	1.00	1.32
20%	0.51	0.51	0.51	1.30	1.00	0.82	1.20	0.82	1.00	1.30
21%	0.52	0.52	0.52	1.28	1.00	0.81	1.27	0.81	1.00	1.28
22%	0.53	0.53	0.53	1.26	1.00	0.79	1.34	0.79	1.00	1.26
23%	0.54	0.54	0.54	1.24	1.00	0.78	1.40	0.78	1.00	1.24
24%	0.54	0.54	0.54	1.22	1.00	0.76	1.46	0.76	1.00	1.22
25%	0.55	0.55	0.55	1.20	1.00	0.75	1.51	0.75	1.00	1.20
26%	0.56	0.56	0.56	1.19	1.00	0.74	1.55	0.74	1.00	1.19
27%	0.57	0.57	0.57	1.17	1.00	0.73	1.59	0.73	1.00	1.17
28%	0.58	0.58	0.58	1.16	1.00	0.72	1.63	0.72	1.00	1.16
29%	0.59	0.59	0.59	1.14	1.00	0.71	1.66	0.71	1.00	1.14
30%	0.60	0.60	0.60	1.13	1.00	0.70	1.68	0.70	1.00	1.13
31%	0.60	0.60	0.60	1.12	1.00	0.70	1.70	0.70	1.00	1.12
32%	0.61	0.61	0.61	1.10	1.00	0.69	1.72	0.69	1.00	1.10
33%	0.62	0.62	0.62	1.09	1.00	0.69	1.74	0.69	1.00	1.09
34%	0.63	0.63	0.63	1.08	1.00	0.68	1.75	0.68	1.00	1.08
35%	0.64	0.64	0.64	1.07	1.00	0.68	1.75	0.68	1.00	1.07
36%	0.65	0.65	0.65	1.06	1.00	0.68	1.75	0.68	1.00	1.06
37%	0.66	0.66	0.66	1.05	1.00	0.67	1.75	0.67	1.00	1.05
38%	0.67	0.67	0.67	1.05	1.00	0.67	1.75	0.67	1.00	1.05
39%	0.68	0.68	0.68	1.04	1.00	0.67	1.74	0.67	1.00	1.04
40%	0.69	0.69	0.69	1.03	1.00	0.67	1.73	0.67	1.00	1.03
41%	0.70	0.70	0.70	1.03	1.00	0.67	1.72	0.67	1.00	1.03
42%	0.70	0.70	0.70	1.02	1.00	0.68	1.71	0.68	1.00	1.02
43%	0.71	0.71	0.71	1.02	1.00	0.68	1.69	0.68	1.00	1.02
44%	0.72	0.72	0.72	1.01	1.00	0.68	1.67	0.68	1.00	1.01
45%	0.73	0.73	0.73	1.01	1.00	0.69	1.65	0.69	1.00	1.01
46%	0.74	0.74	0.74	1.00	1.00	0.69	1.62	0.69	1.00	1.00
47%	0.75	0.75	0.75	1.00	1.00	0.70	1.60	0.70	1.00	1.00
48%	0.76	0.76	0.76	1.00	1.00	0.70	1.57	0.70	1.00	1.00
49%	0.77	0.77	0.77	0.99	1.00	0.71	1.54	0.71	1.00	0.99
50%	0.78	0.78	0.78	0.99	1.00	0.71	1.51	0.71	1.00	0.99
51%	0.79	0.79	0.79	0.99	1.00	0.72	1.48	0.72	1.00	0.99
52%	0.80	0.80	0.80	0.99	1.00	0.73	1.45	0.73	1.00	0.99
53%	0.81	0.81	0.81	0.99	1.00	0.74	1.41	0.74	1.00	0.99
54%	0.82	0.82	0.82	0.99	1.00	0.75	1.38	0.75	1.00	0.99
55%	0.83	0.83	0.83	0.98	1.00	0.75	1.35	0.75	1.00	0.98
56%	0.84	0.84	0.84	0.98	1.00	0.76	1.31	0.76	1.00	0.98
57%	0.85	0.85	0.85	0.98	1.00	0.77	1.27	0.77	1.00	0.98
58%	0.86	0.86	0.86	0.98	1.00	0.78	1.24	0.78	1.00	0.98
59%	0.87	0.87	0.87	0.98	1.00	0.80	1.20	0.80	1.00	0.98
60%	0.88	0.88	0.88	0.98	1.00	0.81	1.16	0.81	1.00	0.98
61%	0.89	0.89	0.89	0.98	1.00	0.82	1.13	0.82	1.00	0.98
62%	0.90	0.90	0.90	0.98	1.00	0.83	1.09	0.83	1.00	0.98
63%	0.91	0.91	0.91	0.99	1.00	0.84	1.06	0.84	1.00	0.99
64%	0.92	0.92	0.92	0.99	1.00	0.85	1.02	0.85	1.00	0.99
65%	0.93	0.93	0.93	0.99	1.00	0.87	0.98	0.87	1.00	0.99
66%	0.94	0.94	0.94	0.99	1.00	0.88	0.95	0.88	1.00	0.99
67%	0.95	0.95	0.95	0.99	1.00	0.89	0.92	0.89	1.00	0.99
68%	0.97	0.97	0.97	0.99	1.00	0.91	0.88	0.91	1.00	0.99
69%	0.98	0.98	0.98	0.99	1.00	0.92	0.85	0.92	1.00	0.99
70%	0.99	0.99	0.99	0.99	1.00	0.93	0.82	0.93	1.00	0.99
71%	1.00	1.00	1.00	0.99	1.00	0.95	0.79	0.95	1.00	0.99
72%	1.01	1.01	1.01	0.99	1.00	0.96	0.76	0.96	1.00	0.99
73%	1.02	1.02	1.02	0.99	1.00	0.98	0.74	0.98	1.00	0.99
74%	1.03	1.03	1.03	0.99	1.00	0.99	0.71	0.99	1.00	0.99
75%	1.04	1.04	1.04	0.99	1.00	1.00	0.69	1.00	1.00	0.99
76%	1.05	1.05	1.05	0.99	1.00	1.02	0.66	1.02	1.00	0.99
77%	1.06	1.06	1.06	0.99	1.00	1.03	0.64	1.03	1.00	0.99
78%	1.07	1.07	1.07	0.99	1.00	1.05	0.63	1.05	1.00	0.99
79%	1.09	1.09	1.09	0.99	1.00	1.06	0.61	1.06	1.00	0.99
80%	1.10	1.10	1.10	0.99	1.00	1.08	0.60	1.08	1.00	0.99
81%	1.11	1.11	1.11	0.99	1.00	1.09	0.58	1.09	1.00	0.99
82%	1.12	1.12	1.12	0.99	1.00	1.10	0.57	1.10	1.00	0.99
83%	1.13	1.13	1.13	0.98	1.00	1.12	0.57	1.12	1.00	0.98
84%	1.14	1.14	1.14	0.98	1.00	1.13	0.56	1.13	1.00	0.98
85%	1.15	1.15	1.15	0.98	1.00	1.15	0.56	1.15	1.00	0.98
86%	1.16	1.16	1.16	0.98	1.00	1.16	0.56	1.16	1.00	0.98
87%	1.18	1.18	1.18	0.97	1.00	1.18	0.56	1.18	1.00	0.97
88%	1.19	1.19	1.19	0.97	1.00	1.19	0.57	1.19	1.00	0.97
89%	1.20	1.20	1.20	0.96	1.00	1.20	0.58	1.20	1.00	0.96
90%	1.21	1.21	1.21	0.96	1.00	1.22	0.59	1.22	1.00	0.96
91%	1.22	1.22	1.22	0.95	1.00	1.23	0.61	1.23	1.00	0.95
92%	1.23	1.23	1.23	0.95	1.00	1.24	0.63	1.24	1.00	0.95
93%	1.25	1.25	1.25	0.94	1.00	1.25	0.65	1.25	1.00	0.94
94%	1.26	1.26	1.26	0.93	1.00	1.27	0.67	1.27	1.00	0.93
95%	1.27	1.27	1.27	0.93	1.00	1.28	0.70	1.28	1.00	0.93
96%	1.28	1.28	1.28	0.92	1.00	1.29	0.73	1.29	1.00	0.92
97%	1.29	1.29	1.29	0.91	1.00	1.30	0.77	1.30	1.00	0.91
98%	1.31	1.31	1.31	0.90	1.00	1.31	0.81	1.31	1.00	0.90
99%	1.32	1.32	1.32	0.89	1.00	1.32	0.85	1.32	1.00	0.89
100%	1.33	1.33	1.33	0.88	1.00	1.34	0.90	1.34	1.00	0.88

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-66. Emission Factors Fuel Adjustment

Slide Valve	PM	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Yes	1	1	1	1	1	0.59	0.43	1	1	1
No	1	1	1	1	1	0.44	1	1	1	1

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-67. Non-MAN Engine Low -Load Adjustments for Emission Factors of OGV Main Propulsion Engines

Variable	PM10	PM2.5	DPM	NOx	SOx	HC	CO
Exponent	1.5	1.5	1.5	1.5	0	1.5	1
Intercept	0.25	0.25	0.25	10.45	0	0.39	0.15
Coefficient	0.006	0.006	0.006	0.126	1.000	0.067	0.838
Ref. EF @ 20% Load	0.316	0.316	0.316	11.853	1.000	1.136	4.339
Factor = Coefficient x Load Factor^-Exponent + Intercept. Factors are normalized by dividing by the factor @ 20% load.							

Source: https://www.portoflosangeles.org/pdf/2014_Air_Emissions_Inventory_Full_Report.pdf

Table B1-68. Vessel Transit Zones and Locations

eference		Description
1	Berth	Vessel at Berth
2	Maneuvering	Maneuvering/transit within Harbor
3	PZ	Transit within Precautionary Area
4	20nm	Fairway transit between end of PZ and 20-Mile Boundary
5	40nm	Fairway transit between 20-Mile to Overwater Boundary
Anchorage	Anchorage	Anchorage

Table B1-69. Annual Average Cargo Vessel Activities for 2014 Unmitigated

	Annual								
Project Scenario/Ship Type	Annual total transits	No. of tugs per call	Number of Arrivals	Number of Departures	Number of Anchorage Calls	Anchorage Time (hr/call)	NonAMP'd Vessel Hotelling Time (hr/call)	% Calls using AMP	AMP'd vessels Auxiliary Engine Hours Runtime
Project Year 2014	-	-	-	-	-	-	-	-	-
Containerships 10,000 - 11,000 TEU	63	2.0	31	32	7	146	109	91%	6.30
Containerships 9,000 - 10,000 TEU	14	2.0	7	7	2	45	99	0%	-
Containerships 8,000 - 9,000 TEU	67	2.0	33	34	6	95	61	97%	6.00
Containerships 6,000 - 7,000 TEU	17	2.0	8	9	-	-	49	33%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	2	2.0	1	1	-	-	34	100%	2.80
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	163		80	83	15	-	-	-	-

Table B1-70. Transit Parameters for 2014 - Unmitigated

CY 2014	Maneuvering	PZ	20nm	40nm
Parameter	2	3	4	5
Average Speed	7.5	11	11.02	11.15
AverageTime	1.0	0.7	0.7	0.5
VRSP Compliant Average Speed (knots)	NA	NA	11.00	11.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	15.00	15.00
VSRP Compliance Rate (% transits)	NA	NA	99%	96%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1

Table B1-71. Peak Day Activity for Ocean Going Vessels during 2014 - Unmitigated

			Peak Day	Peak Day	Total	Peak Day Berthing		Anchorage	
Vessel Bin	Vessel Type	Year	Arrival	Departure	Transits in 24hr	Hotelling Hrs (no AMP)	Berthing Hrs (mitigated w/ AMP)	Anchorage_Hotelling	Shift
Containerships 10,000 - 11,000 TEU	C10000	2014	1	1	2	6.3	17.5	0	0
Containerships 9,000 - 10,000 TEU	C9000	2014	0	0	0	24	0	24	0

Table B1-72. Engine Loads by Zone for 2014 - Unmitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 10,000 - 11,000 TEU	-	1,131	708
	Containerships 4,000 - 5,000 TEU	-	1,161	492
	Containerships 6,000 - 7,000 TEU	-	990	573
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	Containerships 9,000 - 10,000 TEU	-	1,037	475
Manuevering	Containerships 10,000 - 11,000 TEU	1,868	2,105	708
	Containerships 4,000 - 5,000 TEU	1,122	2,526	492
	Containerships 6,000 - 7,000 TEU	1,604	2,197	573
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
Precautionary Area	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 10,000 - 11,000 TEU	14,798	1,730	708
	Containerships 4,000 - 5,000 TEU	8,859	1,434	492
	Containerships 6,000 - 7,000 TEU	12,776	1,453	573
	Containerships 8,000 - 9,000 TEU	13,985	1,597	531
	Containerships 9,000 - 10,000 TEU	14,249	1,501	475
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 10,000 - 11,000 TEU	14,798	1,730	708
	Containerships 4,000 - 5,000 TEU	8,859	1,434	492
	Containerships 6,000 - 7,000 TEU	12,776	1,453	573
	Containerships 8,000 - 9,000 TEU	13,985	1,597	531
	Containerships 9,000 - 10,000 TEU	14,249	1,501	475
Anchorage	Containerships 10,000 - 11,000 TEU	-	1,557	708
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 6,000 - 7,000 TEU	-	-	-
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	Containerships 9,000 - 10,000 TEU	-	1,501	475

Table B1-73. Annual OGVs Emissions in TPY for year 2014 - Unmitigated

Year	Emissions Type	Pollutant CO (tpy)	DPM (tpy)	HC (tpy)	NOx (tpy)	PM (tpy)	PM2.5 (tpy)	SOx (tpy)	CH4 (tpy)	CO2 (tpy)	N2O (tpy)
2014	anchorage	3.40	0.74	1.29	34.34	0.90	0.82	1.85	0.03	3052.56	0.17
	hotelling	3.25	0.53	1.30	32.62	1.15	1.05	3.20	0.03	5613.97	0.40
	transit	5.03	1.21	4.36	131.86	1.29	1.17	2.47	0.10	4344.30	0.30
Grand Total		**11.67**	**2.48**	**6.95**	**198.83**	**3.34**	**3.04**	**7.52**	**0.15**	**13010.84**	**0.87**

Table B1-74. Peak Daily OGVs Emissions in tons/day for year 2014 - Unmitigated

Year	Emissions Type	Pollutant CO (tpd)	DPM (tpd)	HC (tpd)	NOx (tpd)	PM (tpd)	PM2.5 (tpd)	SOx (tpd)	CH4 (tpd)	CO2 (tpd)	N2O (tpd)
2014	Fairway: AQMD Overwater Boundary to 20-Mile	0.03	0.01	0.03	0.59	0.01	0.01	0.02	0.00	25.49	0.00
	Fairway: 20-Mile to Precautionary Area	0.03	0.01	0.03	0.60	0.01	0.01	0.01	0.00	21.84	0.00
	Precautionary Area	0.02	0.00	0.02	0.37	0.00	0.00	0.01	0.00	13.06	0.00
	Manuevering	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	3.29	0.00
	Anchorage	0.05	0.01	0.02	0.44	0.01	0.01	0.01	0.00	38.82	0.00
	Berthing	0.05	0.01	0.02	0.43	0.01	0.01	0.03	0.00	52.90	0.00
Grand Total		**0.17**	**0.04**	**0.11**	**2.51**	**0.05**	**0.04**	**0.08**	**0.00**	**155.40**	**0.01**

Table B1-75. Vessel Transit Zones and Locations

Transit Zones	Short Reference	Description
1	Berth	Vessel at Berth
2	Maneuvering	Maneuvering/transit within Harbor
3	PZ	Transit within Precautionary Area
4	20nm	Fairway transit between end of PZ and 20-Mile Boundary
5	40nm	Fairway transit between 20-Mile to Overwater Boundary
Anchorage	Anchorage	Anchorage

Table B1-76. Annual Average Cargo Vessel Activities for 2014 - FEIR Mitigated

	Annual								
Project Scenario/Ship Type	Annual total transits	No. of tugs per call	Number of Arrivals	Number of Departures	Number of Anchorage Calls	Anchorage Time (hr/call)	NonAMP'd Vessel Hotelling Time (hr/call)	% Calls using AMP	AMP'd vessels Auxiliary Engine Hours Runtime
Project Year 2014	-	-	-	-	-	-	-	-	-
Containerships 10,000 - 11,000 TEU	63	2.0	31	32	7	146	109	100%	6.30
Containerships 9,000 - 10,000 TEU	14	2.0	7	7	2	45	99	100%	-
Containerships 8,000 - 9,000 TEU	67	2.0	33	34	6	95	61	100%	6.00
Containerships 6,000 - 7,000 TEU	17	2.0	8	9	-	-	49	100%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	2	2.0	1	1	-	-	34	100%	2.80
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	163	-	80	83	15	-	-	-	-

Table B1-77. Transit Parameters for 2014 - FEIR Mitigated

CY 2014	Maneuvering	PZ	20nm	40nm
Parameter	2	3	4	5
Average Speed	7.5	11	11.00	11.00
AverageTime	1.0	0.7	0.7	0.5
VRSP Compliant Average Speed (knots)	NA	NA	11.00	11.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	15.00	15.00
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1

Table B1-78. Peak Day Activity for Ocean Going Vessels during 2014 - FEIR Mitigated

			Peak Day	Peak Day	Total	Peak Day Berthing		Anchorage	
Vessel Bin	Vessel Type	Year	Arrival	Departure	Transits in 24hr	Hotelling Hrs (no AMP)	Berthing Hrs (mitigated w/ AMP)	Anchorage_Hotelling	Shift
Containerships 10,000 - 11,000 TEU	C10000	2014	1	1	2	6.3	17.5	0	0
Containerships 9,000 - 10,000 TEU	C9000	2014	0	0	0	0	24	24	0

Table B1-79. Engine Loads by Zone for 2014 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 10,000 - 11,000 TEU	-	1,131	708
	Containerships 4,000 - 5,000 TEU	-	1,161	492
	Containerships 6,000 - 7,000 TEU	-	990	573
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	Containerships 9,000 - 10,000 TEU	-	1,037	475
Manuevering	Containerships 10,000 - 11,000 TEU	1,868	2,105	708
	Containerships 4,000 - 5,000 TEU	1,122	2,526	492
	Containerships 6,000 - 7,000 TEU	1,604	2,197	573
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
Precautionary Area	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 4,000 - 5,000 TEU	3,494	1,434	492
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
Anchorage	Containerships 10,000 - 11,000 TEU	-	1,557	708
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 6,000 - 7,000 TEU	-	-	-
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	Containerships 9,000 - 10,000 TEU	-	1,501	475

Table B1-80. Annual OGVs Emissions in TPY for year 2014 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpy)	DPM (tpy)	HC (tpy)	NOx (tpy)	PM (tpy)	PM2.5 (tpy)	SOx (tpy)	CH4 (tpy)	CO2 (tpy)	N2O (tpy)
2014	anchorage	3.40	0.74	1.29	34.34	0.90	0.82	1.85	0.03	3052.56	0.17
	hotelling	1.57	0.16	0.69	15.97	0.78	0.71	2.71	0.01	4567.01	0.36
	transit	4.96	1.20	4.36	131.20	1.28	1.16	2.45	0.09	4314.33	0.29
Grand Total		**9.93**	**2.10**	**6.34**	**181.51**	**2.95**	**2.69**	**7.02**	**0.13**	**11933.91**	**0.82**

Table B1-81. Peak Daily OGVs Emissions in tons/day for Year 2014 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpd)	DPM (tpd)	HC (tpd)	NOx (tpd)	PM (tpd)	PM2.5 (tpd)	SOx (tpd)	CH4 (tpd)	CO2 (tpd)	N2O (tpd)
2014	Fairway: AQMD Overwater Boundary to 20-Mile	0.03	0.01	0.03	0.59	0.01	0.01	0.02	0.00	25.49	0.00
	Fairway: 20-Mile to Precautionary Area	0.03	0.01	0.03	0.60	0.01	0.01	0.01	0.00	21.84	0.00
	Precautionary Area	0.02	0.00	0.02	0.37	0.00	0.00	0.01	0.00	13.06	0.00
	Manuevering	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	3.29	0.00
	Anchorage	0.05	0.01	0.02	0.44	0.01	0.01	0.01	0.00	38.82	0.00
	Berthing	0.01	0.00	0.01	0.14	0.01	0.01	0.02	0.00	34.08	0.00
Grand Total		**0.14**	**0.03**	**0.10**	**2.23**	**0.04**	**0.04**	**0.07**	**0.00**	**136.58**	**0.01**

Table B1-82. Vessel Transit Zones and Locations

Transit Zones	Short Reference	Description
1	Berth	Vessel at Berth
2	Maneuvering	Maneuvering/transit within Harbor
3	PZ	Transit within Precautionary Area
4	20nm	Fairway transit between end of PZ and 20-Mile Boundary
5	40nm	Fairway transit between 20-Mile to Overwater Boundary
Anchorage	Anchorage	Anchorage

Table B1-83. Annual Average Cargo Vessel Activities for Future Years - FEIR Mitigated

	Annual								
Project Scenario/Ship Type	Annual total transits	No. of tugs per call	Number of Arrivals	Number of Departures	Number of Anchorage Calls	Anchorage Time (hr/call)	NonAMP'd Vessel Hotelling Time (hr/call)	% Calls using AMP	AMP'd vessels Auxiliary Engine Hours Runtime
Project Year 2023	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	41	100%	6.30
Containerships 9,000 - 10,000 TEU	-	2.0	-	-	-	-	-		
Containerships 8,000 - 9,000 TEU	104	2.0	52	52	4	7	35	100%	6.00
Containerships 7,000 - 8,000 TEU	-	2.0	-	-	-	-	-		
Containerships 5,000 - 6,000 TEU	104	2.0	52	52	4	7	31	1.00	3.10
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-
Project Year 2030	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	40	100%	6.30
Containerships 9,000 - 10,000 TEU	104	2.0	52	52	4	7	34	100%	6.15
Containerships 8,000 - 9,000 TEU	-	2.0	-	-	-	-	-		
Containerships 7,000 - 8,000 TEU	104	2.0	52	52	4	7	34	100%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-
Project Year 2036	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	40	100%	6.30
Containerships 9,000 - 10,000 TEU	104	2.0	52	52	4	7	34	100%	6.15
Containerships 8,000 - 9,000 TEU	-	2.0	-	-	-	-	-		
Containerships 7,000 - 8,000 TEU	104	2.0	52	52	4	7	34	100%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-
Project Year 2045	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	40	100%	6.30
Containerships 9,000 - 10,000 TEU	104	2.0	52	52	4	7	34	100%	6.15
Containerships 8,000 - 9,000 TEU	-	2.0	-	-	-	-	-		
Containerships 7,000 - 8,000 TEU	104	2.0	52	52	4	7	34	100%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-

Table B1-84. Transit Parameters for Future Years - FEIR Mitigated

	Maneuvering	PZ	20nm	40nm
Parameter	**2**	**3**	**4**	**5**
Project Year 2023				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	NA	NA	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1
Project Year 2030				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	7.5	11	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1
Project Year 2036				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	7.5	11	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1
Project Year 2045				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	7.5	11	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1

Table B1-85. Peak Day Activity for Ocean Going Vessels during Future Years - FEIR Mitigated

			Peak Day	Peak Day	Total	Peak Day Berthing		Anchorage	
Vessel Bin	Vessel Type	Year	Arrival	Departure	Transits in 24hr	Hotelling Hrs (no AMP)	Berthing Hrs (mitigated w/ AMP)	Anchorage_Hotelling	Shift
Project Year 2023									
Containerships 12,000 - 13,000 TEU	12000	2023	0	1	1	3.15	14.85	0	0
Containerships 5,000 - 6,000 TEU	5000	2023	0	1	1	1.55	16.75	0	0
Containerships 8,000 - 9,000 TEU	8000	2023	1	0	1	3	0	5.5	1
Project Year 2030									
Containerships 7,000 - 8,000 TEU	7000	2030	0	1	1	1.7	10.43	0	0
Containerships 12,000 - 13,000 TEU	12000	2030	0	1	1	3.15	16.02	0	0
Containerships 9,000 - 10,000 TEU	9000	2030	1	0	1	3.075	3.255	7.39	1
Project Year 2036									
Containerships 7,000 - 8,000 TEU	7000	2036	0	1	1	1.7	10.43	0	0
Containerships 12,000 - 13,000 TEU	12000	2036	0	1	1	3.15	16.02	0	0
Containerships 9,000 - 10,000 TEU	9000	2036	1	0	1	3.075	3.255	7.39	1
Project Year 2045									
Containerships 7,000 - 8,000 TEU	7000	2045	0	1	1	1.7	10.43	0	0
Containerships 12,000 - 13,000 TEU	12000	2045	0	1	1	3.15	16.02	0	0
Containerships 9,000 - 10,000 TEU	9000	2045	1	0	1	3.075	3.255	7.39	1

Table B1-86. Engine Loads by Zone for 2023 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	-	1,037	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	-	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-87. Engine Loads by Zone for 2030 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	General Cargo Vessels	-	-	-
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	General Cargo Vessels	-	-	-
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	General Cargo Vessels	-	-	-

Table B1-88. Engine Loads by Zone for 2036 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	General Cargo Vessels	-	-	-
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	General Cargo Vessels	-	-	-
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	General Cargo Vessels	-	-	-

Table B1-89. Engine Loads by Zone for 2045 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	General Cargo Vessels	-	-	-
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	General Cargo Vessels	-	-	-
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	General Cargo Vessels	-	-	-

Table B1-90. Annual OGVs Emissions in TPY for Year 2023 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpy)	DPM (tpy)	HC (tpy)	NOx (tpy)	PM (tpy)	PM2.5 (tpy)	SOx (tpy)	CH4 (tpy)	CO2 (tpy)	N2O (tpy)
2023	anchorage	0.27	0.06	0.12	2.73	0.06	0.06	0.13	0.00	189.86	0.01
	hotelling	1.80	0.26	0.75	18.63	0.74	0.69	2.56	0.01	3853.50	0.29
	transit	14.76	2.87	8.36	257.94	2.99	2.76	5.77	0.15	8684.19	0.54
Grand Total		**16.82**	**3.19**	**9.23**	**279.30**	**3.80**	**3.51**	**8.45**	**0.17**	**12727.55**	**0.84**

Table B1-91. Peak Daily OGVs Emissions in tons/day for year 2023 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpd)	DPM (tpd)	HC (tpd)	NOx (tpd)	PM (tpd)	PM2.5 (tpd)	SOx (tpd)	CH4 (tpd)	CO2 (tpd)	N2O (tpd)
2023	Fairway: AQMD Overwater Boundary to 20-Mile	0.04	0.01	0.02	0.81	0.01	0.01	0.02	0.00	27.16	0.00
	Fairway: 20-Mile to Precautionary Area	0.06	0.01	0.03	1.06	0.01	0.01	0.02	0.00	35.57	0.00
	Precautionary Area	0.03	0.01	0.02	0.45	0.01	0.00	0.01	0.00	15.10	0.00
	Manuevering	0.02	0.00	0.01	0.15	0.00	0.00	0.00	0.00	5.67	0.00
	Anchorage	0.01	0.00	0.00	0.17	0.00	0.00	0.01	0.00	11.23	0.00
	Berthing	0.02	0.00	0.01	0.16	0.01	0.01	0.02	0.00	29.43	0.00
Grand Total		**0.17**	**0.03**	**0.09**	**2.81**	**0.04**	**0.04**	**0.08**	**0.00**	**124.16**	**0.01**

Table B1-92. Annual OGVs Emissions in TPY for Year 2030 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpy)	DPM (tpy)	HC (tpy)	NOx (tpy)	PM (tpy)	PM2.5 (tpy)	SOx (tpy)	CH4 (tpy)	CO2 (tpy)	N2O (tpy)
2030	anchorage	0.34	0.06	0.18	2.42	0.07	0.07	0.12	0.00	182.99	0.01
	hotelling	1.76	0.26	0.73	16.46	0.73	0.67	2.50	0.01	3770.97	0.28
	transit	32.92	4.67	16.25	203.15	4.79	4.42	5.93	0.15	8929.55	0.45
Grand Total		**35.01**	**4.99**	**17.17**	**222.03**	**5.59**	**5.16**	**8.55**	**0.17**	**12883.51**	**0.74**

Table B1-93. Peak Daily OGVs Emissions in tons/day for Year 2030 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpd)	DPM (tpd)	HC (tpd)	NOx (tpd)	PM (tpd)	PM2.5 (tpd)	SOx (tpd)	CH4 (tpd)	CO2 (tpd)	N2O (tpd)
2030	Fairway: AQMD Overwater Boundary to 20-Mile	0.04	0.01	0.02	0.81	0.01	0.01	0.02	0.00	27.16	0.00
	Fairway: 20-Mile to Precautionary Area	0.06	0.01	0.03	1.06	0.01	0.01	0.02	0.00	35.57	0.00
	Precautionary Area	0.03	0.01	0.02	0.45	0.01	0.00	0.01	0.00	15.10	0.00
	Manuevering	0.02	0.00	0.01	0.15	0.00	0.00	0.00	0.00	5.67	0.00
	Anchorage	0.01	0.00	0.00	0.17	0.00	0.00	0.01	0.00	11.23	0.00
	Berthing	0.02	0.00	0.01	0.16	0.01	0.01	0.02	0.00	29.43	0.00
Grand Total		**0.17**	**0.03**	**0.09**	**2.81**	**0.04**	**0.04**	**0.08**	**0.00**	**124.16**	**0.01**

Table B1-94. Annual OGVs Emissions in TPY for Year 2036 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpy)	DPM (tpy)	HC (tpy)	NOx (tpy)	PM (tpy)	PM2.5 (tpy)	SOx (tpy)	CH4 (tpy)	CO2 (tpy)	N2O (tpy)
2036	anchorage	0.34	0.06	0.18	1.59	0.07	0.07	0.12	0.00	182.99	0.01
	hotelling	1.76	0.26	0.73	12.99	0.73	0.67	2.50	0.01	3770.97	0.28
	transit	32.92	4.67	16.25	129.71	4.79	4.42	5.93	0.15	8929.55	0.45
Grand Total		**35.01**	**4.99**	**17.17**	**144.29**	**5.59**	**5.16**	**8.55**	**0.17**	**12883.51**	**0.74**

Table B1-95. Peak Daily OGVs Emissions in tons/day for Year 2036 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpd)	DPM (tpd)	HC (tpd)	NOx (tpd)	PM (tpd)	PM2.5 (tpd)	SOx (tpd)	CH4 (tpd)	CO2 (tpd)	N2O (tpd)
2036	Fairway: AQMD Overwater Boundary to 20-Mile	0.04	0.01	0.02	0.81	0.01	0.01	0.02	0.00	27.16	0.00
	Fairway: 20-Mile to Precautionary Area	0.06	0.01	0.03	1.06	0.01	0.01	0.02	0.00	35.57	0.00
	Precautionary Area	0.03	0.01	0.02	0.45	0.01	0.00	0.01	0.00	15.10	0.00
	Manuevering	0.02	0.00	0.01	0.15	0.00	0.00	0.00	0.00	5.67	0.00
	Anchorage	0.01	0.00	0.00	0.17	0.00	0.00	0.01	0.00	11.23	0.00
	Berthing	0.02	0.00	0.01	0.16	0.01	0.01	0.02	0.00	29.43	0.00
Grand Total		**0.17**	**0.03**	**0.09**	**2.81**	**0.04**	**0.04**	**0.08**	**0.00**	**124.16**	**0.01**

Table B1-96. Annual OGVs Emissions in TPY for Year 2045 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpy)	DPM (tpy)	HC (tpy)	NOx (tpy)	PM (tpy)	PM2.5 (tpy)	SOx (tpy)	CH4 (tpy)	CO2 (tpy)	N2O (tpy)
2045	anchorage	0.34	0.06	0.18	0.72	0.07	0.07	0.12	0.00	182.99	0.01
	hotelling	1.76	0.26	0.73	9.28	0.73	0.67	2.50	0.01	3770.97	0.28
	transit	32.92	4.67	16.25	53.72	4.79	4.42	5.93	0.15	8929.55	0.45
Grand Total		**35.01**	**4.99**	**17.17**	**63.73**	**5.59**	**5.16**	**8.55**	**0.17**	**12883.51**	**0.74**

Table B1-97. Peak Daily OGVs Emissions in tons/day for Year 2045 - FEIR Mitigated

Year	Emissions Type	Pollutant CO (tpd)	DPM (tpd)	HC (tpd)	NOx (tpd)	PM (tpd)	PM2.5 (tpd)	SOx (tpd)	CH4 (tpd)	CO2 (tpd)	N2O (tpd)
2045	Fairway: AQMD Overwater Boundary to 20-Mile	0.04	0.01	0.02	0.81	0.01	0.01	0.02	0.00	27.16	0.00
	Fairway: 20-Mile to Precautionary Area	0.06	0.01	0.03	1.06	0.01	0.01	0.02	0.00	35.57	0.00
	Precautionary Area	0.03	0.01	0.02	0.45	0.01	0.00	0.01	0.00	15.10	0.00
	Manuevering	0.02	0.00	0.01	0.15	0.00	0.00	0.00	0.00	5.67	0.00
	Anchorage	0.01	0.00	0.00	0.17	0.00	0.00	0.01	0.00	11.23	0.00
	Berthing	0.02	0.00	0.01	0.16	0.01	0.01	0.02	0.00	29.43	0.00
Grand Total		**0.17**	**0.03**	**0.09**	**2.81**	**0.04**	**0.04**	**0.08**	**0.00**	**124.16**	**0.01**

Table B1-98. Vessel Transit Zones and Locations

Transit Zones	Short Reference	Description
1	Berth	Vessel at Berth
2	Maneuvering	Maneuvering/transit within Harbor
3	PZ	Transit within Precautionary Area
4	20nm	Fairway transit between end of PZ and 20-Mile Boundary
5	40nm	Fairway transit between 20-Mile to Overwater Boundary
Anchorage	Anchorage	Anchorage

Table B1-99. Annual Average Cargo Vessel Activities for Future Years - Proposed Mitigated

	Annual								
Project Scenario/Ship Type	Annual total transits	No. of tugs per call	Number of Arrivals	Number of Departures	Number of Anchorage Calls	Anchorage Time (hr/call)	NonAMP'd Vessel Hotelling Time (hr/call)	% Calls using AMP	AMP'd vessels Auxiliary Engine Hours Runtime
Project Year 2023	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	41	95%	6.30
Containerships 9,000 - 10,000 TEU	-	2.0	-	-	-	-	-		
Containerships 8,000 - 9,000 TEU	104	2.0	52	52	4	7	35	95%	6.00
Containerships 7,000 - 8,000 TEU	-	2.0	-	-	-	-	-		
Containerships 5,000 - 6,000 TEU	104	2.0	52	52	4	7	31	0.95	3.10
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-
Project Year 2030	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	40	95%	6.30
Containerships 9,000 - 10,000 TEU	104	2.0	52	52	4	7	34	95%	6.15
Containerships 8,000 - 9,000 TEU	-	2.0	-	-	-	-	-		
Containerships 7,000 - 8,000 TEU	104	2.0	52	52	4	7	34	95%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-
Project Year 2036	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	40	95%	6.30
Containerships 9,000 - 10,000 TEU	104	2.0	52	52	4	7	34	95%	6.15
Containerships 8,000 - 9,000 TEU	-	2.0	-	-	-	-	-		
Containerships 7,000 - 8,000 TEU	104	2.0	52	52	4	7	34	95%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-
Project Year 2045	-	-	-	-	-	-	-	-	-
Containerships 12,000 - 13,000 TEU	104	2.0	52	52	4	7	40	95%	6.30
Containerships 9,000 - 10,000 TEU	104	2.0	52	52	4	7	34	95%	6.15
Containerships 8,000 - 9,000 TEU	-	2.0	-	-	-	-	-		
Containerships 7,000 - 8,000 TEU	104	2.0	52	52	4	7	34	95%	3.40
Containerships 5,000 - 6,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	2.0	-	-	-	-	-		
Containerships 3,000 - 4,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	2.0	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	2.0	-	-	-	-	-	-	-
General Cargo Vessels	-	2.0	-	-	-	-	-	-	-
Total	312	-	-	-	-	-	-	-	-

Table B1-100. Transit Parameters for Future Years - Proposed Mitigated

	Maneuvering	PZ	20nm	40nm
Parameter	**2**	**3**	**4**	**5**
Project Year 2023				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	NA	NA	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	95%	95%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1
Project Year 2030				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	7.5	11	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	95%	95%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1
Project Year 2036				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	7.5	11	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	95%	95%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1
Project Year 2045				
Average Speed	7.5	11	12.51	13.86
AverageTime	not used	not used	not used	not used
VRSP Compliant Average Speed (knots)	7.5	11	12.00	12.00
VRSP Non-Compliant Average Speed (knots)	NA	NA	22.00	22.00
VSRP Compliance Rate (% transits)	NA	NA	95%	95%
distance in miles (from CS DEIR 2008)	3.5	10.4	22.4	17.1

Table B1-101. Peak Day Activity for Ocean Going Vessels during Future Years - Proposed Mitigated

			Peak Day	Peak Day	Total	Peak Day Berthing		Anchorage	
Vessel Bin	Vessel Type	Year	Arrival	Departure	Transits in 24hr	Hotelling Hrs (no AMP)	Berthing Hrs (mitigated w/ AMP)	Anchorage_Hotelling	Shift
Project Year 2023									
Containerships 12,000 - 13,000 TEU	12000	2023	0	1	1	3.15	14.85	0	0
Containerships 5,000 - 6,000 TEU	5000	2023	0	1	1	1.55	16.75	0	0
Containerships 8,000 - 9,000 TEU	8000	2023	1	0	1	3	0	5.5	1
Project Year 2030									
Containerships 7,000 - 8,000 TEU	7000	2030	0	1	1	1.7	10.43	0	0
Containerships 12,000 - 13,000 TEU	12000	2030	0	1	1	3.15	16.02	0	0
Containerships 9,000 - 10,000 TEU	9000	2030	1	0	1	3.075	3.255	7.39	1
Project Year 2036									
Containerships 7,000 - 8,000 TEU	7000	2036	0	1	1	1.7	10.43	0	0
Containerships 12,000 - 13,000 TEU	12000	2036	0	1	1	3.15	16.02	0	0
Containerships 9,000 - 10,000 TEU	9000	2036	1	0	1	3.075	3.255	7.39	1
Project Year 2045									
Containerships 7,000 - 8,000 TEU	7000	2045	0	1	1	1.7	10.43	0	0
Containerships 12,000 - 13,000 TEU	12000	2045	0	1	1	3.15	16.02	0	0
Containerships 9,000 - 10,000 TEU	9000	2045	1	0	1	3.075	3.255	7.39	1

Table B1-102. Engine Loads by Zone for 2023 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	-	1,037	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	-	1,501	475
	General Cargo Vessels	-	-	-
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-103. Engine Loads by Zone for 2030 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	General Cargo Vessels	-	-	-
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	General Cargo Vessels	-	-	-
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	General Cargo Vessels	-	-	-
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	General Cargo Vessels	-	-	-

Table B1-104. Engine Loads by Zone for 2036 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	General Cargo Vessels	-	-	-
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	General Cargo Vessels	-	-	-
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	General Cargo Vessels	-	-	-
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	General Cargo Vessels	-	-	-

Table B1-105. Engine Loads by Zone for 2045 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	General Cargo Vessels	-	-	-
Manuevering	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	General Cargo Vessels	-	-	-
Precautionary Area	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	General Cargo Vessels	-	-	-
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	General Cargo Vessels	-	-	-
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 3,000 - 4,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	-	-
	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	General Cargo Vessels	-	-	-

Rail
Locomotives and Switchers

Year	2014

Table B1-106. On-site Rail Operations 2014 - All Scenarios

Parameters	2014	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.918	0.818
Average hours of operation per visit	1.5	1.5
Number of locomotives per train	4	1
Average HP of locomotive	4,000	4,000
Average Load Factor	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	16

On-site Switchers	WBCT
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.08
Fuel Type (diesel S content in ppm)*	15

Table B1-107. China Shipping On -site Switching Activity 2014 - All Scenarios

Activity	2014
Annual Throughput WBCT	1,606,707
China Shipping Fraction of Throughput	0.68
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**901**

Table B1-108. Offsite Rail Operations 2014 - All Scenarios

Parameters	2014 Train Length (ft) 12,000	10,000	8,000	8,813	6,000	2,000
Line-Hauls Travelling within SCAB						
Peak Month Daily Train-miles in SCAB Region (miles/day)						
Alameda Corridor		0.8	1.0	23.4	0.8	6.9
East River Bank		0.1	0.2	0.9	0.1	
BNSF San Bernardino		3.5	4.7	48.8	3.5	
BNSF Cajon		1.3	1.7	17.5	1.3	
UP Los Angeles		1.4	1.9	11.6	1.4	
UP Alhambra		1.5	2.0	12.4	1.5	
UP Yuma		1.7	2.2	13.7	1.7	
UP Mojave		0.1	0.2	1.0	0.1	
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Off-dock In-yard Linehaul Activity						
Average # of train visits per day						
UP ICTF Yard		0.1	0.1		0.1	
BNSF Hobart & Commerce Yards		0.0	0.1		0.0	
UP East LA Yard		0.0	0.0		0.0	
UP LATC Yard		0.0	0.0		0.0	
UP COI Yard		0.0	0.0		0.0	
BNSF SB Yard						
BNSF SCIG Yard						
Average hours of operation per visit	1.5	1.5	1.5	1.5	1.5	1.5
Number of locomotives per train	6	5	4	4	3	1
Average HP of locomotive	4,000	4,000	4,000	4,000	4,000	4,000
Average Load Factor	0.28	0.28	0.28	0.28	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	15	15	16	17	18
Line-Hauls Travelling from SCAB border to CA border						
Average # of train visits per day						
BNSF Cajon		0.1	0.1	0.7	0.1	na
UP Yuma		0.0	0.1	0.4	0.0	na
UP Mojave		0.0	0.0	0.0	0.0	na
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Average travel distance (miles/train)						
BNSF Cajon	191	191	191	191	191	191
UP Yuma	184	184	184	184	184	184
UP Mojave	184	184	184	184	184	184

Off-site Switchers In-yard	
China Shipping-related Annual Throughput in Off-dock RailYard (TEUs)	
UP ICTF Yard	29,001
BNSF Hobart & Commerce Yards	25,606
UP East LA Yard	114
UP LATC Yard	249
UP COI Yard	6
BNSF SB Yard	0
BNSF SCIG Yard	0
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.083
Fuel Type (diesel S content in ppm)*	15

* Based on data collected during development of the 2001 POLA emissions inventory

Table B1-109. China Shipping Line -haul In Yard Activity 2014 - All Scenarios

Parameters	2014 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	7,647
China Shipping Related Off-dock Activity	
UP ICTF Yard	1,252
BNSF Hobart & Commerce Yards	1,105
UP East LA Yard	5
UP LATC Yard	11
UP COI Yard	0
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-110. China Shipping Line-haul Traveling 2014 - All Scenarios

	2014
Fuel Productivity Factor (gross ton-miles/gal)	717

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each year.
Source: From ARB, Locomotive Inventory Update: Line Haul Activity (2014).

Fuel Consumption Rate (bhp-hr/gal):	20.80

Source: EPA (2009), Emission Factors for Locomotives.

Table B1-111. Line-haul Travel within SCAB 2014 - All Scenarios

Parameters	Peak Day Train Travel	Peak Daily Work Done by Line Haul Locomotives *
Subdivisions	(gross ton-mi/day)	(hp-hr/day)
Alameda Corridor	239,987	6,961
East River Bank	11,264	327
BNSF San Bernardino	523,123	15,174
BNSF Cajon	189,550	5,498
UP Los Angeles	140,090	4,063
UP Alhambra	149,333	4,332
UP Yuma	165,435	4,799
UP Mojave	11,579	336

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-112. Line-haul Travel from SCAB Border to CA Border 2014 - All Scenarios

Parameters	Peak Day Train Travel	Peak Daily Work Done by Line Haul Locomotives*
Segments	(gross ton-mi/day)	(hp-hr/day)
BNSF Cajon	1,459,841	42,344
UP Yuma	862,325	25,013
UP Mojave	76,087	2,207

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-113. China Shipping Switchers In Yard Activity 2014 - All Scenarios

	2014
Activity/Yards	Peak Day Work Done by Switchers (hp-hr/day)*
On-site (In terminal) Activity	901
China Shipping-Related Off-dock Activity	
UP ICTF Yard	126
BNSF Hobart & Commerce Yards	111
UP East LA Yard	0
UP LATC Yard	1
UP COI Yard	0
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Table B1-114. Base Year Line-Haul Adjustment for Rebuilds

ARB Vision 2.0 Locomotive Module - South Coast[1]				Starcrest Data	Tier Share - Adjusted for Rebuilds[2]
ID	CY	Tier	Tier_Share	China Shipping - Line-Haul Estimate For Base Year	
10090	2014	Pre-Tier	0.00%	0.42%	**0.42%**
10151	2014	Tier 0	6.87%	16.36%	**3.07%**
10212	2014	Tier 0r	29.76%		**13.29%**
10273	2014	Tier 1	1.54%	17.01%	**3.19%**
10334	2014	Tier 1r	6.69%		**13.82%**
10395	2014	Tier 2	27.68%	53.14%	**39.85%**
10456	2014	Tier 2r	9.23%		**13.28%**
10517	2014	Tier 3	18.23%	13.08%	**13.08%**
10578	2014	Tier 4	0.00%	0.00%	**0.00%**

Notes:

1) Data obtained from ARB 2015 Vision 2.0 Locomotive Module

2) Fleet mix provided by Starcrest was adjusted using the percentage of rebuilds in the ARB Vision 2.0 Locomotive Module data for each tier level: http://www.arb.ca.gov/planning/vision/docs/vision2.0lr_locomotive_module.accdb

Table B1-115. Line-Haul Composite Emission Factors - all scenarios - in g/bhp-hr

Year	Type	Emission Factors[1] (g/bhp-hr)									
		VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul	0.250	1.280	5.692	0.005	0.168	0.168	0.157	494.0	0.040	0.013
2023	Line-Haul	0.165	1.280	4.605	0.005	0.105	0.105	0.098	494.0	0.040	0.013
2030	Line-Haul	0.109	1.280	3.189	0.005	0.065	0.065	0.062	494.0	0.040	0.013
2036	Line-Haul	0.073	1.280	2.175	0.005	0.039	0.039	0.038	494.0	0.040	0.013
2045	Line-Haul	0.046	1.280	1.271	0.005	0.019	0.019	0.019	494.0	0.040	0.013

Table B1-116. Switchers Composite Emission Factors - all scenarios - in g/bhp-hr

Year	Type	Emission Factors[1] (g/bhp-hr)									
		VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Switchers	0.241	1.802	4.403	0.006	0.037	0.037	0.034	669.4	0.050	0.017
2023	Switchers	0.241	1.802	4.403	0.006	0.037	0.037	0.034	669.4	0.050	0.017
2030	Switchers	0.241	1.802	4.403	0.006	0.037	0.037	0.034	669.4	0.050	0.017
2036	Switchers	0.241	1.802	4.403	0.006	0.037	0.037	0.034	669.4	0.050	0.017
2045	Switchers	0.241	1.802	4.403	0.006	0.037	0.037	0.034	669.4	0.050	0.017

Note:

1) Emission Factors represent a composit mix of the various engine tier levels and corresponding tier-specific emission factors, weighted according to the fleet mix percentage of each tier.

Table B1-117. Fuel Productivity Factor for Locomotives

Fuel Productivity Factor (gross ton-miles/gal)				
2014	2023	2030	2036	2045
717.09	784.27	840.84	892.57	976.19

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each year.
Source: From ARB, Locomotive Inventory Update: Line Haul Activity (2014).

Table B1-118. Rail Fleet Characteristics & Mix

Train Description	% of Fleet Mix				
	2014	2023	2030	2036	2045
Line-Haul					
pre-controlled	0.004	--	--	--	--
Tier 0	0.031	--	--	--	--
Tier 0+	0.133	0.243	0.097	0.022	--
Tier 1	0.032	--	--	--	--
Tier 1+	0.138	0.113	0.067	0.033	--
Tier 2	0.399	--	--	--	--
Tier 2+	0.133	0.198	0.153	0.091	0.016
Tier 3	0.131	0.170	0.153	0.125	0.053
Tier 4	0.000	0.276	0.531	0.729	0.931
Switchers					
PHL's pre-controlled switchers	--	--	--	--	--
pre-controlled	--	--	--	--	--
Tier 0	--	--	--	--	--
Tier 0+	--	--	--	--	--
Tier 1	--	--	--	--	--
Tier 1+	--	--	--	--	--
Tier 2	--	--	--	--	--
Tier 2+	--	--	--	--	--
Tier 3	0.914	0.914	0.914	0.914	0.914
Tier 4	--	--	--	--	--
Gensets	0.086	0.086	0.086	0.086	0.086

Table B1-119. Rail Raw Emission Factors by Tier

Locomotive Type	EF (g/bhp-hr)									
	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
Line Hauls										
pre-controlled	0.48	1.28	13	0.005	0.32	0.32	0.29	494	0.04	0.013
Tier 0	0.48	1.28	8.6	0.005	0.32	0.32	0.29	494	0.04	0.013
Tier 0+	0.3	1.28	7.2	0.005	0.2	0.2	0.18	494	0.04	0.013
Tier 1	0.47	1.28	6.7	0.005	0.32	0.32	0.29	494	0.04	0.013
Tier 1+	0.29	1.28	6.7	0.005	0.2	0.2	0.18	494	0.04	0.013
Tier 2	0.26	1.28	4.95	0.005	0.18	0.18	0.17	494	0.04	0.013
Tier 2+	0.13	1.28	4.95	0.005	0.08	0.08	0.08	494	0.04	0.013
Tier 3	0.13	1.28	4.95	0.005	0.08	0.08	0.08	494	0.04	0.013
Tier 4	0.04	1.28	1	0.005	0.015	0.015	0.015	494	0.04	0.013
Switchers										
PHL's pre-controlled switchers*	0.87	1.83	17.6	0.006	0.38	0.38	0.35	678	0.05	0.017
pre-controlled	1.01	1.83	12.6	0.006	0.44	0.44	0.4	678	0.05	0.017
Tier 0	1.01	1.83	12.6	0.006	0.44	0.44	0.4	678	0.05	0.017
Tier 0+										
Tier 1**	1.01	1.83	9.9	0.006	0.43	0.43	0.4	678	0.05	0.017
Tier 1+										
Tier 1	0.51	1.83	7.3	0.006	0.19	0.19	0.17	678	0.05	0.017
Tier 2+										
Tier 3	0.26	1.83	4.5	0.006	0.036	0.036	0.033	678	0.05	0.017
Tier 4										
Gensets	0.04	1.51	3.37	0.005	0.05	0.05	0.05	578	0.05	0.015

* Based on data collected during development of the 2001 POLA emissions inventory

Fuel Consumption Rate (bhp-hr/gal):	20.80

Source: EPA (2009), Emission Factors for Locomotives.

Notes:

1. Emission factors for VOC, NOx, and PM10 were calculated from g/gal factors published in EPA *Technical Highlights: Emission Factors for Locomotives* , EPA-420-F-09-025, April 2009, except for NOx in 2012-2015. NOx emission factors in 2012-2015 reflect compliance with the 2005 MOU, and are based on the 2011 compliance report (the latest available). By 2016, the EPA emission factors become cleaner than the MOU emission factor; therefore, national fleet average emission factors for NOx were used starting in 2016.
2. VOC emission factors equal 1.053 x HC emission factors, per EPA *Regulatory Impact Analysis: Control of Emissions of Air Pollution from Locomotive Engines and Marine Compression Ignition Engines Less than 30 Liters Per Cylinder* , EPA-420-R-08-001a, May 2008, page 3-77.
3. Emission factor for CO from EPA *Locomotive Emission Standards - Regulatory Support Document* , April 1998.
4. PM2.5 emissions are assumed to be 92% of PM10 emissions (POLA 2012 Air Emissions Inventory, pg. 115).
5. GHG emissions factors (CO2, N2O, and CH4) are from the POLA 2012 Air Emissions Inventory, Table 6.6.
6. PM, PM10, and DPM emissions from locomotives are assumed to be equivalent (POLA 2012 Air Emissions Inventory, pg. 115).
7. Emission factors for SOx were calculated using mass balance based on fuel sulfur content, assuming all sulfur is converted to SO2. The average line haul locomotive fuel mixture is assumed to be 100% out of state fuel for arriving locomotives, and 90% California ULSD and 10% out of state fuel for departing locomotives. (Starcrest, personal communication with Joseph Ray, April 12, 2013).
8. California ULSD fuel is assumed to have an average sulfur content of 15 ppm for all project analysis years. Out of state fuel is assumed to have an average sulfur content of 123 ppm through 2012, and 15 ppm starting 2013 in response to the EPA Nonroad Diesel Fuel Rule (15 ppm in-use is required by 12/1/2012). The 2012 EPA diesel fuel sulfur content is from Table 3.4-8a of EPA's *Final Regulatory Analysis: Control of Emissions from Nonroad Diesel Engines* , EPA-420-R-04-007, May 2004.
9. Emission factors assume a line haul locomotive fuel consumption rate of 20.8 bhp-hr per gallon of fuel, from EPA Technical Highlights: Emission Factors for Locomotives, EPA-420-F-09-025, April 2009.

Analysis Year:	2014

Table B1-120. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2014

Year	Type	Subdivision	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Alameda Corridor	6,961	3.830	19.644	87.356	0.077	2.584	2.584	2.409	7,581	0.614	0.200
2014	Line-Haul Travel	East River Bank	327	0.180	0.922	4.100	0.004	0.121	0.121	0.113	356	0.029	0.009
2014	Line-Haul Travel	BNSF San Bernardino	15,174	8.348	42.819	190.418	0.167	5.633	5.633	5.252	16,526	1.338	0.435
2014	Line-Haul Travel	BNSF Cajon	5,498	3.025	15.515	68.997	0.060	2.041	2.041	1.903	5,988	0.485	0.158
2014	Line-Haul Travel	UP Los Angeles	4,063	2.236	11.467	50.993	0.045	1.509	1.509	1.406	4,425	0.358	0.116
2014	Line-Haul Travel	UP Alhambra	4,332	2.383	12.223	54.358	0.048	1.608	1.608	1.499	4,717	0.382	0.124
2014	Line-Haul Travel	UP Yuma	4,799	2.640	13.541	60.219	0.053	1.782	1.782	1.661	5,226	0.423	0.138
2014	Line-Haul Travel	UP Mojave	336	0.185	0.948	4.215	0.004	0.125	0.125	0.116	366	0.030	0.010

Table B1-121. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2014

Year	Type	Segment	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	BNSF Cajon	42,344	23.296	119.492	531.386	0.466	15.721	15.721	14.656	46,117	3.734	1.214
2014	Line-Haul Travel	UP Yuma	25,013	13.761	70.584	313.889	0.275	9.286	9.286	8.657	27,241	2.206	0.717
2014	Line-Haul Travel	UP Mojave	2,207	1.214	6.228	27.696	0.024	0.819	0.819	0.764	2,404	0.195	0.063

Table B1-122. Line-haul Travel Peak Daily Total Emissions (lbs/day) 2014

Year	Type	Region	Peak Day Work from Locomotives (hp-hr/day)	Peak Daily Emissions (lbs/day)									
				V OC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Within SCAB boundaries	41,489	23	117	521	0	15	15	14	45,185	4	1
2014	Line-Haul Travel	Between SCAB Boundar	69,564	38	196	873	1	26	26	24	75,761	6	2

Peaking Factor:	240.501

Annual Emissions (tons/yr):

Table B1-123. Line-haul Travel Within SCAB Boundaries Annual Emissions 2014

Year	Type	Subdivision	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Alameda Corridor	1,674,149	0.461	2.362	10.505	0.009	0.311	0.311	0.290	911.644	0.074	0.024
2014	Line-Haul Travel	East River Bank	78,580	0.022	0.111	0.493	0.000	0.015	0.015	0.014	42.790	0.003	0.001
2014	Line-Haul Travel	BNSF San Bernardino	3,649,302	1.004	5.149	22.898	0.020	0.677	0.677	0.632	1,987.197	0.161	0.052
2014	Line-Haul Travel	BNSF Cajon	1,322,299	0.364	1.866	8.297	0.007	0.245	0.245	0.229	720.047	0.058	0.019
2014	Line-Haul Travel	UP Los Angeles	977,264	0.269	1.379	6.132	0.005	0.181	0.181	0.169	532.161	0.043	0.014
2014	Line-Haul Travel	UP Alhambra	1,041,747	0.287	1.470	6.537	0.006	0.193	0.193	0.180	567.274	0.046	0.015
2014	Line-Haul Travel	UP Yuma	1,154,074	0.317	1.628	7.241	0.006	0.214	0.214	0.200	628.441	0.051	0.017
2014	Line-Haul Travel	UP Mojave	80,772	0.022	0.114	0.507	0.000	0.015	0.015	0.014	43.984	0.004	0.001

Table B1-124. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2014

Year	Type	Segment	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	BNSF Cajon	10,183,839	2.801	14.369	63.899	0.056	1.890	1.890	1.762	5,545.524	0.449	0.146
2014	Line-Haul Travel	UP Yuma	6,015,571	1.655	8.488	37.745	0.033	1.117	1.117	1.041	3,275.729	0.265	0.086
2014	Line-Haul Travel	UP Mojave	530,786	0.146	0.749	3.330	0.003	0.099	0.099	0.092	289.035	0.023	0.008

Table B1-125. Line-haul Travel Total Annual Emissions (tons/yr) 2014

Year	Type	Region	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Within SCAB boundaries	9,978,187	2.745	14.079	62.609	0.055	1.852	1.852	1.727	5,433.538	0.440	0.143
2014	Line-Haul Travel	Between SCAB Boundar	16,730,196	4.602	23.606	104.975	0.092	3.106	3.106	2.895	9,110.288	0.738	0.240

One Hour Peak Emissions (lbs/hr):

Table B1-126. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2014

Year	Type	Subdivision	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Alameda Corridor	290.05	0.16	0.82	3.64	0.00	0.11	0.11	0.10	315.88	0.03	0.01
2014	Line-Haul Travel	East River Bank	13.61	0.01	0.04	0.17	0.00	0.01	0.01	0.00	14.83	0.00	0.00
2014	Line-Haul Travel	BNSF San Bernardino	632.24	0.35	1.78	7.93	0.01	0.23	0.23	0.22	688.56	0.06	0.02
2014	Line-Haul Travel	BNSF Cajon	229.09	0.13	0.65	2.87	0.00	0.09	0.09	0.08	249.50	0.02	0.01
2014	Line-Haul Travel	UP Los Angeles	169.31	0.09	0.48	2.12	0.00	0.06	0.06	0.06	184.39	0.01	0.00
2014	Line-Haul Travel	UP Alhambra	180.48	0.10	0.51	2.26	0.00	0.07	0.07	0.06	196.56	0.02	0.01
2014	Line-Haul Travel	UP Yuma	199.94	0.11	0.56	2.51	0.00	0.07	0.07	0.07	217.75	0.02	0.01
2014	Line-Haul Travel	UP Mojave	13.99	0.01	0.04	0.18	0.00	0.01	0.01	0.00	15.24	0.00	0.00

Table B1-127. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2014

Year	Type	Segment	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	BNSF Cajon	1,764.35	0.97	4.98	22.14	0.02	0.66	0.66	0.61	1,921.52	0.16	0.05
2014	Line-Haul Travel	UP Yuma	1,042.20	0.57	2.94	13.08	0.01	0.39	0.39	0.36	1,135.04	0.09	0.03
2014	Line-Haul Travel	UP Mojave	91.96	0.05	0.26	1.15	0.00	0.03	0.03	0.03	100.15	0.01	0.00

Table B1-128. Line-haul Travel Total Peak Hourly Emissions 2014

Year	Type	Region	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Within SCAB boundaries	1,729	0.951	4.878	21.694	0.019	0.642	0.642	0.598	1,882.718	0.152	0.050
2014	Line-Haul Travel	Between SCAB Boundar	2,899	1.595	8.179	36.374	0.032	1.076	1.076	1.003	3,156.711	0.256	0.083

Eight-Hour Peak Period Emissions (lbs/hr):

Table B1-129. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2014

Year	Type	Subdivision	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Alameda Corridor	2,320.37	1.28	6.55	29.12	0.03	0.86	0.86	0.80	2,527.07	0.20	0.07
2014	Line-Haul Travel	East River Bank	108.91	0.06	0.31	1.37	0.00	0.04	0.04	0.04	118.61	0.01	0.00
2014	Line-Haul Travel	BNSF San Bernardino	5,057.93	2.78	14.27	63.47	0.06	1.88	1.88	1.75	5,508.50	0.45	0.14
2014	Line-Haul Travel	BNSF Cajon	1,832.70	1.01	5.17	23.00	0.02	0.68	0.68	0.63	1,995.97	0.16	0.05
2014	Line-Haul Travel	UP Los Angeles	1,354.49	0.75	3.82	17.00	0.01	0.50	0.50	0.47	1,475.15	0.12	0.04
2014	Line-Haul Travel	UP Alhambra	1,443.86	0.79	4.07	18.12	0.02	0.54	0.54	0.50	1,572.48	0.13	0.04
2014	Line-Haul Travel	UP Yuma	1,599.54	0.88	4.51	20.07	0.02	0.59	0.59	0.55	1,742.04	0.14	0.05
2014	Line-Haul Travel	UP Mojave	111.95	0.06	0.32	1.40	0.00	0.04	0.04	0.04	121.92	0.01	0.00

Table B1-130. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2014

Year	Type	Segment	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	BNSF Cajon	14,114.78	7.77	39.83	177.13	0.16	5.24	5.24	4.89	15,372.17	1.24	0.40
2014	Line-Haul Travel	UP Yuma	8,337.57	4.59	23.53	104.63	0.09	3.10	3.10	2.89	9,080.31	0.74	0.24
2014	Line-Haul Travel	UP Mojave	735.67	0.40	2.08	9.23	0.01	0.27	0.27	0.25	801.20	0.06	0.02

Table B1-131. Line-haul Travel Total 8-hr Peak Period Emissions 2014

Year	Type	Region	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul Travel	Within SCAB boundaries	13,830	7.609	39.026	173.552	0.152	5.134	5.134	4.787	15,061.748	1.220	0.396
2014	Line-Haul Travel	Between SCAB Boundar	23,188	12.757	65.435	290.990	0.255	8.609	8.609	8.026	25,253.684	2.045	0.665

Analysis Year:	2014

Table B1-132. Line-haul In-yard Peak Daily Emissions (lbs/day) 2014

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Line Haul In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul	WBCT (On-Site)	7,647	4.207	21.580	95.966	0.084	2.839	2.839	2.647	8,328.454	0.674	0.219
2014	Line-Haul	UP ICTF Yard	1,252	0.689	3.533	15.710	0.014	0.465	0.465	0.433	1,363.393	0.110	0.036
2014	Line-Haul	BNSF Hobart & Commerce Yards	1,105	0.608	3.119	13.871	0.012	0.410	0.410	0.383	1,203.792	0.097	0.032
2014	Line-Haul	UP East LA Yard	5	0.003	0.014	0.062	0.000	0.002	0.002	0.002	5.374	0.000	0.000
2014	Line-Haul	UP LATC Yard	11	0.006	0.030	0.135	0.000	0.004	0.004	0.004	11.712	0.001	0.000
2014	Line-Haul	UP COI Yard	0	0.000	0.001	0.004	0.000	0.000	0.000	0.000	0.304	0.000	0.000
2014	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**2,373**	1.31	6.70	29.78	0.03	0.88	0.88	0.82	2,584.57	0.21	0.07

Table B1-133. Line-haul In-yard Annual Emissions (tons/yr) 2014

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Line Haul In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul	WBCT (On-Site)	1,839,160	0.506	2.595	11.540	0.010	0.341	0.341	0.318	1,001.499	0.081	0.026
2014	Line-Haul	UP ICTF Yard	301,076	0.083	0.425	1.889	0.002	0.056	0.056	0.052	163.948	0.013	0.004
2014	Line-Haul	BNSF Hobart & Commerce Yards	265,831	0.073	0.375	1.668	0.001	0.049	0.049	0.046	144.756	0.012	0.004
2014	Line-Haul	UP East LA Yard	1,187	0.000	0.002	0.007	0.000	0.000	0.000	0.000	0.646	0.000	0.000
2014	Line-Haul	UP LATC Yard	2,586	0.001	0.004	0.016	0.000	0.000	0.000	0.000	1.408	0.000	0.000
2014	Line-Haul	UP COI Yard	67	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.037	0.000	0.000
2014	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**570,747**	0.16	0.81	3.58	0.00	0.11	0.11	0.10	310.80	0.03	0.01

Peaking Factor:	240.501

Table B1-134. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2014

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Peak Line Haul In-Yard Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul	WBCT (On-Site)	318.63	0.175	0.899	3.999	0.004	0.118	0.118	0.110	347.019	0.028	0.009
2014	Line-Haul	UP ICTF Yard	52.16	0.029	0.147	0.655	0.001	0.019	0.019	0.018	56.808	0.005	0.001
2014	Line-Haul	BNSF Hobart & Commerce Yards	46.06	0.025	0.130	0.578	0.001	0.017	0.017	0.016	50.158	0.004	0.001
2014	Line-Haul	UP East LA Yard	0.21	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.224	0.000	0.000
2014	Line-Haul	UP LATC Yard	0.45	0.000	0.001	0.006	0.000	0.000	0.000	0.000	0.488	0.000	0.000
2014	Line-Haul	UP COI Yard	0.01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000
2014	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**99**	0.05	0.28	1.24	0.00	0.04	0.04	0.03	107.69	0.01	0.00

Table B1-135. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2014

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Line Haul In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Line-Haul	WBCT (On-Site)	2,549.07	1.402	7.193	31.989	0.028	0.946	0.946	0.882	2,776.151	0.225	0.073
2014	Line-Haul	UP ICTF Yard	417.29	0.230	1.178	5.237	0.005	0.155	0.155	0.144	454.464	0.037	0.012
2014	Line-Haul	BNSF Hobart & Commerce Yards	368.44	0.203	1.040	4.624	0.004	0.137	0.137	0.128	401.264	0.032	0.011
2014	Line-Haul	UP East LA Yard	1.64	0.001	0.005	0.021	0.000	0.001	0.001	0.001	1.791	0.000	0.000
2014	Line-Haul	UP LATC Yard	3.58	0.002	0.010	0.045	0.000	0.001	0.001	0.001	3.904	0.000	0.000
2014	Line-Haul	UP COI Yard	0.09	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.101	0.000	0.000
2014	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**791**	0.44	2.23	9.93	0.01	0.29	0.29	0.27	861.52	0.07	0.02

Analysis Year:	2014

Table B1-136. Switchers In-yard Peak Daily Emissions (lbs/day) 2014

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Switcher In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Switchers	WBCT (On-Site)	901	0.479	3.579	8.741	0.012	0.074	0.074	0.068	1,329.011	0.099	0.033
2014	Switchers	UP ICTF Yard	126	0.067	0.499	1.219	0.002	0.010	0.010	0.010	185.302	0.014	0.005
2014	Switchers	BNSF Hobart & Commerce Yards	111	0.059	0.441	1.076	0.001	0.009	0.009	0.008	163.610	0.012	0.004
2014	Switchers	UP East LA Yard	0	0.000	0.002	0.005	0.000	0.000	0.000	0.000	0.730	0.000	0.000
2014	Switchers	UP LATC Yard	1	0.001	0.004	0.010	0.000	0.000	0.000	0.000	1.592	0.000	0.000
2014	Switchers	UP COI Yard	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.041	0.000	0.000
2014	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**238**	0.13	0.95	2.31	0.00	0.02	0.02	0.02	351.28	0.03	0.01

Table B1-137. Switchers In-yard Annual Emissions (tons/yr) 2014

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Switcher In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Switchers	WBCT (On-Site)	216,588	0.058	0.430	1.051	0.001	0.009	0.009	0.008	159.814	0.012	0.004
2014	Switchers	UP ICTF Yard	30,198	0.008	0.060	0.147	0.000	0.001	0.001	0.001	22.283	0.002	0.001
2014	Switchers	BNSF Hobart & Commerce Yards	26,663	0.007	0.053	0.129	0.000	0.001	0.001	0.001	19.674	0.001	0.000
2014	Switchers	UP East LA Yard	119	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.088	0.000	0.000
2014	Switchers	UP LATC Yard	259	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.191	0.000	0.000
2014	Switchers	UP COI Yard	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.000	0.000
2014	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**57,247**	0.02	0.11	0.28	0.00	0.00	0.00	0.00	42.24	0.00	0.00

Peaking Factor:	240.501

Table B1-138. Switchers In-yard Peak Hour Emissions (lbs/hr) 2014

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Switcher In-Yard Peak Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Switchers	WBCT (On-Site)	37.52	0.020	0.149	0.364	0.000	0.003	0.003	0.003	55.375	0.004	0.001
2014	Switchers	UP ICTF Yard	5.23	0.003	0.021	0.051	0.000	0.000	0.000	0.000	7.721	0.001	0.000
2014	Switchers	BNSF Hobart & Commerce Yards	4.62	0.002	0.018	0.045	0.000	0.000	0.000	0.000	6.817	0.001	0.000
2014	Switchers	UP East LA Yard	0.02	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.000
2014	Switchers	UP LATC Yard	0.04	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.066	0.000	0.000
2014	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.000	0.000
2014	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**10**	0.01	0.04	0.10	0.00	0.00	0.00	0.00	14.64	0.00	0.00

Table B1-139. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2014

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Switcher In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2014	Switchers	WBCT (On-Site)	300.19	0.160	1.193	2.914	0.004	0.025	0.025	0.023	443.004	0.033	0.011
2014	Switchers	UP ICTF Yard	41.86	0.022	0.166	0.406	0.001	0.003	0.003	0.003	61.767	0.005	0.002
2014	Switchers	BNSF Hobart & Commerce Yards	36.96	0.020	0.147	0.359	0.000	0.003	0.003	0.003	54.537	0.004	0.001
2014	Switchers	UP East LA Yard	0.16	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.243	0.000	0.000
2014	Switchers	UP LATC Yard	0.36	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.531	0.000	0.000
2014	Switchers	UP COI Yard	0.01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.000
2014	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2014	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**79**	0.04	0.32	0.77	0.00	0.01	0.01	0.01	117.09	0.01	0.00

Year	2023

Table B1-140. Onsite Rail Operations 2023 - All Scenarios

Parameters	2023	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.979	1.265
Average hours of operation per visit	1.5	1.5
Number of locomotives per train	4	1
Average HP of locomotive	4,000	4,000
Average Load Factor	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	16

On-site Switchers	WBCT
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.08
Fuel Type (diesel S content in ppm)*	15

Table B1-141. China Shipping On -site Switching Activity 2023 - All Scenarios

Activity	2023
Annual Throughput WBCT	2,687,975
China Shipping Fraction of Throughput	0.57
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**752**

Table B1-142. Off -site Rail Operations 2023 - All Scenarios

Parameters	2023 Train Length (ft) 12,000	10,000	8,000	8,813	6,000	2,000
Line-Hauls Travelling within SCAB						
Peak Month Daily Train-miles in SCAB Region (miles/day)						
Alameda Corridor		1.8	3.6	25.1		10.6
East River Bank		0.3	0.5	1.3		
BNSF San Bernardino		16.6	33.7	46.5		
BNSF Cajon		6.3	12.9	16.7		
UP Los Angeles		7.5	15.1	15.9		
UP Alhambra		6.4	13.0	16.9		
UP Yuma		7.1	14.5	18.8		
UP Mojave		0.5	1.0	1.3		
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Off-dock In-yard Linehaul Activity						
Average # of train visits per day						
UP ICTF Yard		0.1	0.3			
BNSF Hobart & Commerce Yards		0.2	0.5			
UP East LA Yard		0.1	0.2			
UP LATC Yard						
UP COI Yard						
BNSF SB Yard						
BNSF SCIG Yard						
Average hours of operation per visit	1.5	1.5	1.5	1.5	1.5	1.5
Number of locomotives per train	6	5	4	4	3	1
Average HP of locomotive	4,000	4,000	4,000	4,000	4,000	4,000
Average Load Factor	0.28	0.28	0.28	0.28	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	15	15	16	17	18
Line-Hauls Travelling from SCAB border to CA border						
Average # of train visits per day						
BNSF Cajon		0.3	0.5	0.7		na
UP Yuma		0.2	0.4	0.5		na
UP Mojave		0.0	0.0	0.0		na
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Average travel distance (miles/train)						
BNSF Cajon	191	191	191	191	191	191
UP Yuma	184	184	184	184	184	184
UP Mojave	184	184	184	184	184	184

Off-site Switchers In-yard	
China Shipping-related Annual Throughput in Off-dock RailYard (TEUs)	
UP ICTF Yard	74,221
BNSF Hobart & Commerce Yards	136,911
UP East LA Yard	62,689
UP LATC Yard	0
UP COI Yard	0
BNSF SB Yard	0
BNSF SCIG Yard	0
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.083
Fuel Type (diesel S content in ppm)*	15

* Based on data collected during development of the 2001 POLA emissions inventory

Table B1-143. China Shipping Linehaul In-yard Activity 2023 - All Scenarios

Parameters	2023 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	8,821
China Shipping Related Off-dock Activity	
UP ICTF Yard	2,875
BNSF Hobart & Commerce Yards	5,304
UP East LA Yard	2,429
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-144. China Shipping Line-haul Traveling 2023 - All Scenarios

	2023
Fuel Productivity Factor (gross ton-miles/gal)	784

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each year.
Source: From ARB, Locomotive Inventory Update: Line Haul Activity (2014).

Fuel Consumption Rate (bhp-hr/gal):	20.80

Source: EPA (2009), Emission Factors for Locomotives.

Table B1-145. Line-haul Travel Within SCAB 2023 - All Scenarios

Parameters	Peak Day Train Travel	Peak Daily Work Done by Line Haul Locomotives *
Subdivisions	(gross ton-mi/day)	(hp-hr/day)
Alameda Corridor	289,048	7,666
East River Bank	18,220	483
BNSF San Bernardino	846,032	22,438
BNSF Cajon	313,013	8,302
UP Los Angeles	335,676	8,903
UP Alhambra	317,591	8,423
UP Yuma	352,286	9,343
UP Mojave	24,656	654

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-146. Line-haul Travel from SCAB Border to CA Border 2023 - All Scenarios

Parameters	Peak Day Train Travel	Peak Daily Work Done by Line Haul Locomotives*
Segments	(gross ton-mi/day)	(hp-hr/day)
BNSF Cajon	2,410,701	63,935
UP Yuma	1,836,278	48,701
UP Mojave	162,024	4,297

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-147. China Shipping Switchers In-yard Activity 2023 - All Scenarios

	2023
Activity/Yards	Peak Day Work Done by Switchers (hp-hr/day)*
On-site (In terminal) Activity	752
China Shipping-Related Off-dock Activity	
UP ICTF Yard	245
BNSF Hobart & Commerce Yards	451
UP East LA Yard	207
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2023

Table B1-148. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2023

Year	Type	Subdivision	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Alameda Corridor	7,666	2.781	21.633	77.821	0.084	1.771	1.771	1.651	8,349	0.676	0.220
2023	Line-Haul Travel	East River Bank	483	0.175	1.364	4.905	0.005	0.112	0.112	0.104	526	0.043	0.014
2023	Line-Haul Travel	BNSF San Bernardino	22,438	8.141	63.318	227.779	0.247	5.184	5.184	4.832	24,437	1.979	0.643
2023	Line-Haul Travel	BNSF Cajon	8,302	3.012	23.426	84.273	0.091	1.918	1.918	1.788	9,041	0.732	0.238
2023	Line-Haul Travel	UP Los Angeles	8,903	3.230	25.122	90.375	0.098	2.057	2.057	1.917	9,696	0.785	0.255
2023	Line-Haul Travel	UP Alhambra	8,423	3.056	23.769	85.506	0.093	1.946	1.946	1.814	9,173	0.743	0.241
2023	Line-Haul Travel	UP Yuma	9,343	3.390	26.366	94.846	0.103	2.159	2.159	2.012	10,175	0.824	0.268
2023	Line-Haul Travel	UP Mojave	654	0.237	1.845	6.638	0.007	0.151	0.151	0.141	712	0.058	0.019

Table B1-149. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2023

Year	Type	Segment	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	BNSF Cajon	63,935	23.197	180.420	649.037	0.704	14.771	14.771	13.767	69,631	5.638	1.832
2023	Line-Haul Travel	UP Yuma	48,701	17.669	137.430	494.384	0.536	11.251	11.251	10.487	53,039	4.295	1.396
2023	Line-Haul Travel	UP Mojave	4,297	1.559	12.126	43.622	0.047	0.993	0.993	0.925	4,680	0.379	0.123

Table B1-150. Line-haul Travel Total Peak Daily Emissions (lbs/day) 2023

Year	Type	Region	Peak Day Work from Locomotives (hp-hr/day)	Peak Daily Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Within SCAB boundaries	66,211	24	187	672	1	15	15	14	72,110	6	2
2023	Line-Haul Travel	Between SCAB Boundar	116,933	42	330	1,187	1	27	27	25	127,350	10	3

Peaking Factor:	246.953

Annual Emissions (tons/yr):

Table B1-151. Line-haul Travel Within SCAB Boundaries Annual Emissions 2023

Year	Type	Subdivision	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Alameda Corridor	1,893,138	0.343	2.671	9.609	0.010	0.219	0.219	0.204	1,030.892	0.083	0.027
2023	Line-Haul Travel	East River Bank	119,331	0.022	0.168	0.606	0.001	0.014	0.014	0.013	64.981	0.005	0.002
2023	Line-Haul Travel	BNSF San Bernardino	5,541,146	1.005	7.818	28.125	0.030	0.640	0.640	0.597	3,017.385	0.244	0.079
2023	Line-Haul Travel	BNSF Cajon	2,050,097	0.372	2.893	10.406	0.011	0.237	0.237	0.221	1,116.363	0.090	0.029
2023	Line-Haul Travel	UP Los Angeles	2,198,533	0.399	3.102	11.159	0.012	0.254	0.254	0.237	1,197.193	0.097	0.032
2023	Line-Haul Travel	UP Alhambra	2,080,087	0.377	2.935	10.558	0.011	0.240	0.240	0.224	1,132.694	0.092	0.030
2023	Line-Haul Travel	UP Yuma	2,307,320	0.419	3.256	11.711	0.013	0.267	0.267	0.248	1,256.432	0.102	0.033
2023	Line-Haul Travel	UP Mojave	161,485	0.029	0.228	0.820	0.001	0.019	0.019	0.017	87.936	0.007	0.002

Table B1-152. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2023

Year	Type	Segment	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	BNSF Cajon	15,789,051	2.864	22.278	80.141	0.087	1.824	1.824	1.700	8,597.796	0.696	0.226
2023	Line-Haul Travel	UP Yuma	12,026,824	2.182	16.969	61.045	0.066	1.389	1.389	1.295	6,549.106	0.530	0.172
2023	Line-Haul Travel	UP Mojave	1,061,190	0.193	1.497	5.386	0.006	0.123	0.123	0.114	577.862	0.047	0.015

Table B1-153. Line-haul Travel Total Annual Emissions (tons/yr) 2023

Year	Type	Region	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Within SCAB boundaries	16,351,137	2.966	23.071	82.994	0.090	1.889	1.889	1.760	8,903.875	0.721	0.234
2023	Line-Haul Travel	Between SCAB Boundar	28,877,065	5.239	40.744	146.572	0.159	3.336	3.336	3.109	15,724.764	1.273	0.414

One Hour Peak Emissions (lbs/hr):

Table B1-154. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2023

Year	Type	Subdivision	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Alameda Corridor	319.42	0.12	0.90	3.24	0.00	0.07	0.07	0.07	347.87	0.03	0.01
2023	Line-Haul Travel	East River Bank	20.13	0.01	0.06	0.20	0.00	0.00	0.00	0.00	21.93	0.00	0.00
2023	Line-Haul Travel	BNSF San Bernardino	934.92	0.34	2.64	9.49	0.01	0.22	0.22	0.20	1,018.20	0.08	0.03
2023	Line-Haul Travel	BNSF Cajon	345.90	0.13	0.98	3.51	0.00	0.08	0.08	0.07	376.71	0.03	0.01
2023	Line-Haul Travel	UP Los Angeles	370.94	0.13	1.05	3.77	0.00	0.09	0.09	0.08	403.99	0.03	0.01
2023	Line-Haul Travel	UP Alhambra	350.96	0.13	0.99	3.56	0.00	0.08	0.08	0.08	382.22	0.03	0.01
2023	Line-Haul Travel	UP Yuma	389.30	0.14	1.10	3.95	0.00	0.09	0.09	0.08	423.98	0.03	0.01
2023	Line-Haul Travel	UP Mojave	27.25	0.01	0.08	0.28	0.00	0.01	0.01	0.01	29.67	0.00	0.00

Table B1-155. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2023

Year	Type	Segment	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	BNSF Cajon	2,663.97	0.97	7.52	27.04	0.03	0.62	0.62	0.57	2,901.29	0.23	0.08
2023	Line-Haul Travel	UP Yuma	2,029.20	0.74	5.73	20.60	0.02	0.47	0.47	0.44	2,209.97	0.18	0.06
2023	Line-Haul Travel	UP Mojave	179.05	0.06	0.51	1.82	0.00	0.04	0.04	0.04	195.00	0.02	0.01

Table B1-156. Line-haul Travel Total Peak Hourly Emissions 2023

Year	Type	Region	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Within SCAB boundaries	2,759	1.001	7.785	28.006	0.030	0.637	0.637	0.594	3,004.573	0.243	0.079
2023	Line-Haul Travel	Between SCAB Boundar	4,872	1.768	13.749	49.460	0.054	1.126	1.126	1.049	5,306.252	0.430	0.140

Eight-Hour Peak Period Emissions (lbs/hr):

Table B1-157. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2023

Year	Type	Subdivision	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Alameda Corridor	2,555.32	0.93	7.21	25.94	0.03	0.59	0.59	0.55	2,782.96	0.23	0.07
2023	Line-Haul Travel	East River Bank	161.07	0.06	0.45	1.64	0.00	0.04	0.04	0.03	175.42	0.01	0.00
2023	Line-Haul Travel	BNSF San Bernardino	7,479.34	2.71	21.11	75.93	0.08	1.73	1.73	1.61	8,145.63	0.66	0.21
2023	Line-Haul Travel	BNSF Cajon	2,767.18	1.00	7.81	28.09	0.03	0.64	0.64	0.60	3,013.69	0.24	0.08
2023	Line-Haul Travel	UP Los Angeles	2,967.54	1.08	8.37	30.12	0.03	0.69	0.69	0.64	3,231.90	0.26	0.09
2023	Line-Haul Travel	UP Alhambra	2,807.66	1.02	7.92	28.50	0.03	0.65	0.65	0.60	3,057.78	0.25	0.08
2023	Line-Haul Travel	UP Yuma	3,114.38	1.13	8.79	31.62	0.03	0.72	0.72	0.67	3,391.82	0.27	0.09
2023	Line-Haul Travel	UP Mojave	217.97	0.08	0.62	2.21	0.00	0.05	0.05	0.05	237.39	0.02	0.01

Table B1-158. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2023

Year	Type	Segment	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	BNSF Cajon	21,311.78	7.73	60.14	216.35	0.23	4.92	4.92	4.59	23,210.30	1.88	0.61
2023	Line-Haul Travel	UP Yuma	16,233.59	5.89	45.81	164.79	0.18	3.75	3.75	3.50	17,679.74	1.43	0.47
2023	Line-Haul Travel	UP Mojave	1,432.38	0.52	4.04	14.54	0.02	0.33	0.33	0.31	1,559.98	0.13	0.04

Table B1-159. Line-haul Travel Total 8-hr Peak Period Emissions 2023

Year	Type	Region	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul Travel	Within SCAB boundaries	22,070	8.008	62.281	224.048	0.243	5.099	5.099	4.752	24,036.585	1.946	0.633
2023	Line-Haul Travel	Between SCAB Boundar	38,978	14.142	109.992	395.681	0.429	9.005	9.005	8.393	42,450.017	3.437	1.117

Analysis Year:	2023

Table B1-160. Line-haul In-yard Peak Daily Emissions (lbs/day) 2023

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Line Haul In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul	WBCT (On-Site)	8,821	3.200	24.891	89.542	0.097	2.038	2.038	1.899	9,606.380	0.778	0.253
2023	Line-Haul	UP ICTF Yard	2,875	1.043	8.114	29.190	0.032	0.664	0.664	0.619	3,131.596	0.254	0.082
2023	Line-Haul	BNSF Hobart & Commerce Yards	5,304	1.924	14.968	53.845	0.058	1.225	1.225	1.142	5,776.634	0.468	0.152
2023	Line-Haul	UP East LA Yard	2,429	0.881	6.854	24.655	0.027	0.561	0.561	0.523	2,645.038	0.214	0.070
2023	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**10,608**	3.85	29.94	107.69	0.12	2.45	2.45	2.28	11,553.27	0.94	0.30

Table B1-161. Line-haul In-yard Annual Emissions (tons/yr) 2023

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Line Haul In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul	WBCT (On-Site)	2,178,280	0.395	3.073	11.056	0.012	0.252	0.252	0.235	1,186.164	0.096	0.031
2023	Line-Haul	UP ICTF Yard	710,100	0.129	1.002	3.604	0.004	0.082	0.082	0.076	386.679	0.031	0.010
2023	Line-Haul	BNSF Hobart & Commerce Yards	1,309,872	0.238	1.848	6.649	0.007	0.151	0.151	0.141	713.280	0.058	0.019
2023	Line-Haul	UP East LA Yard	599,772	0.109	0.846	3.044	0.003	0.069	0.069	0.065	326.601	0.026	0.009
2023	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**2,619,744**	0.48	3.70	13.30	0.01	0.30	0.30	0.28	1,426.56	0.12	0.04

Peaking Factor:	246.953

Table B1-162. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2023

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Peak Line Haul In-Yard Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul	WBCT (On-Site)	367.53	0.133	1.037	3.731	0.004	0.085	0.085	0.079	400.266	0.032	0.011
2023	Line-Haul	UP ICTF Yard	119.81	0.043	0.338	1.216	0.001	0.028	0.028	0.026	130.483	0.011	0.003
2023	Line-Haul	BNSF Hobart & Commerce Yards	221.01	0.080	0.624	2.244	0.002	0.051	0.051	0.048	240.693	0.019	0.006
2023	Line-Haul	UP East LA Yard	101.20	0.037	0.286	1.027	0.001	0.023	0.023	0.022	110.210	0.009	0.003
2023	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**442**	0.16	1.25	4.49	0.00	0.10	0.10	0.10	481.39	0.04	0.01

Table B1-163. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2023

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Line Haul In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Line-Haul	WBCT (On-Site)	2,940.20	1.067	8.297	29.847	0.032	0.679	0.679	0.633	3,202.127	0.259	0.084
2023	Line-Haul	UP ICTF Yard	958.48	0.348	2.705	9.730	0.011	0.221	0.221	0.206	1,043.865	0.085	0.027
2023	Line-Haul	BNSF Hobart & Commerce Yards	1,768.04	0.641	4.989	17.948	0.019	0.408	0.408	0.381	1,925.545	0.156	0.051
2023	Line-Haul	UP East LA Yard	809.56	0.294	2.285	8.218	0.009	0.187	0.187	0.174	881.679	0.071	0.023
2023	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**3,536**	1.28	9.98	35.90	0.04	0.82	0.82	0.76	3,851.09	0.31	0.10

Analysis Year:	2023

Table B1-164. Switchers In-yard Peak Daily Emissions (lbs/day) 2023

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Switcher In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Switchers	WBCT (On-Site)	752	0.400	2.989	7.301	0.010	0.062	0.062	0.057	1,110.071	0.083	0.028
2023	Switchers	UP ICTF Yard	245	0.130	0.972	2.375	0.003	0.020	0.020	0.019	361.071	0.027	0.009
2023	Switchers	BNSF Hobart & Commerce Yards	451	0.240	1.793	4.381	0.006	0.037	0.037	0.034	666.042	0.050	0.017
2023	Switchers	UP East LA Yard	207	0.110	0.821	2.006	0.003	0.017	0.017	0.016	304.971	0.023	0.008
2023	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**903**	0.48	3.59	8.76	0.01	0.07	0.07	0.07	1,332.08	0.10	0.03

Table B1-165. Switchers In-yard Annual Emissions (tons/yr) 2023

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Switcher In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Switchers	WBCT (On-Site)	185,761	0.049	0.369	0.902	0.001	0.008	0.008	0.007	137.068	0.010	0.003
2023	Switchers	UP ICTF Yard	60,422	0.016	0.120	0.293	0.000	0.002	0.002	0.002	44.584	0.003	0.001
2023	Switchers	BNSF Hobart & Commerce Yards	111,457	0.030	0.221	0.541	0.001	0.005	0.005	0.004	82.241	0.006	0.002
2023	Switchers	UP East LA Yard	51,034	0.014	0.101	0.248	0.000	0.002	0.002	0.002	37.657	0.003	0.001
2023	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**222,913**	0.06	0.44	1.08	0.00	0.01	0.01	0.01	164.48	0.01	0.00

Peaking Factor:	246.953

Table B1-166. Switchers In-yard Peak Hour Emissions (lbs/hr) 2023

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Switcher In-Yard Peak Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Switchers	WBCT (On-Site)	31.34	0.017	0.125	0.304	0.000	0.003	0.003	0.002	46.253	0.003	0.001
2023	Switchers	UP ICTF Yard	10.19	0.005	0.041	0.099	0.000	0.001	0.001	0.001	15.045	0.001	0.000
2023	Switchers	BNSF Hobart & Commerce Yards	18.81	0.010	0.075	0.183	0.000	0.002	0.002	0.001	27.752	0.002	0.001
2023	Switchers	UP East LA Yard	8.61	0.005	0.034	0.084	0.000	0.001	0.001	0.001	12.707	0.001	0.000
2023	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**38**	0.02	0.15	0.37	0.00	0.00	0.00	0.00	55.50	0.00	0.00

Table B1-167. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2023

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Switcher In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2023	Switchers	WBCT (On-Site)	250.74	0.133	0.996	2.434	0.003	0.021	0.021	0.019	370.024	0.028	0.009
2023	Switchers	UP ICTF Yard	81.56	0.043	0.324	0.792	0.001	0.007	0.007	0.006	120.357	0.009	0.003
2023	Switchers	BNSF Hobart & Commerce Yards	150.44	0.080	0.598	1.460	0.002	0.012	0.012	0.011	222.014	0.017	0.006
2023	Switchers	UP East LA Yard	68.89	0.037	0.274	0.669	0.001	0.006	0.006	0.005	101.657	0.008	0.003
2023	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2023	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**301**	0.16	1.20	2.92	0.00	0.02	0.02	0.02	444.03	0.03	0.01

Year	2030

Table B1-168. Onsite Rail Operations 2030 - All Scenarios

Parameters	2030	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.990	1.221
Average hours of operation per visit	1.5	1.5
Number of locomotives per train	4	1
Average HP of locomotive	4,000	4,000
Average Load Factor	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	16

On-site Switchers	**WBCT**
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.08
Fuel Type (diesel S content in ppm)*	15

Table B1-169. China Shipping On -site Switching Activity 2030 - All Scenarios

Activity	2030
Annual Throughput WBCT	3,209,451
China Shipping Fraction of Throughput	0.53
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**703**

Table B1-170. Off -site Rail Operations 2030 - All Scenarios

Parameters	2030 Train Length (ft) 12,000	10,000	8,000	8,813	6,000	2,000
Line-Hauls Travelling within SCAB						
Peak Month Daily Train-miles in SCAB Region (miles/day)						
Alameda Corridor		3.7	7.5	26.4		10.3
East River Bank		0.5	1.1	1.3		
BNSF San Bernardino		19.8	40.2	48.6		
BNSF Cajon		7.5	15.1	17.4		
UP Los Angeles		7.3	14.8	16.6		
UP Alhambra		7.6	15.3	17.7		
UP Yuma		8.4	17.0	19.6		
UP Mojave		0.6	1.2	1.4		
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Off-dock In-yard Linehaul Activity						
Average # of train visits per day						
UP ICTF Yard		0.3	0.5			
BNSF Hobart & Commerce Yards		0.3	0.6			
UP East LA Yard		0.0	0.0			
UP LATC Yard						
UP COI Yard						
BNSF SB Yard						
BNSF SCIG Yard						
Average hours of operation per visit	1.5	1.5	1.5	1.5	1.5	1.5
Number of locomotives per train	6	5	4	4	3	1
Average HP of locomotive	4,000	4,000	4,000	4,000	4,000	4,000
Average Load Factor	0.28	0.28	0.28	0.28	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	15	15	16	17	18
Line-Hauls Travelling from SCAB border to CA border						
Average # of train visits per day						
BNSF Cajon		0.3	0.6	0.7		na
UP Yuma		0.2	0.5	0.6		na
UP Mojave		0.0	0.0	0.0		na
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Average travel distance (miles/train)						
BNSF Cajon	191	191	191	191	191	191
UP Yuma	184	184	184	184	184	184
UP Mojave	184	184	184	184	184	184

Off-site Switchers In-yard	
China Shipping-related Annual Throughput in Off-dock RailYard (TEUs)	
UP ICTF Yard	153,068
BNSF Hobart & Commerce Yards	161,125
UP East LA Yard	8,056
UP LATC Yard	0
UP COI Yard	0
BNSF SB Yard	0
BNSF SCIG Yard	0
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.083
Fuel Type (diesel S content in ppm)*	15

* Based on data collected during development of the 2001 POLA emissions inventory

Table B1-171. China Shipping Line-haul In-yard Activity 2030 - All Scenarios

Parameters	2030 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	8,823
China Shipping Related Off-dock Activity	
UP ICTF Yard	5,930
BNSF Hobart & Commerce Yards	6,242
UP East LA Yard	312
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-172. China Shipping Line -haul Traveling 2030 - All Scenarios

	2030
Fuel Productivity Factor (gross ton-miles/gal)	841

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each year.
Source: From ARB, Locomotive Inventory Update: Line Haul Activity (2014).

Fuel Consumption Rate (bhp-hr/gal):	20.80

Source: EPA (2009), Emission Factors for Locomotives.

Table B1-173. Line-haul Travel within SCAB 2030 - All Scenarios

Parameters	**Peak Day Train Travel**	**Peak Daily Work Done by Line Haul Locomotives ***
Subdivisions	(gross ton-mi/day)	(hp-hr/day)
Alameda Corridor	349,673	8,650
East River Bank	26,075	645
BNSF San Bernardino	947,100	23,428
BNSF Cajon	348,878	8,630
UP Los Angeles	337,492	8,349
UP Alhambra	353,982	8,756
UP Yuma	392,651	9,713
UP Mojave	27,481	680

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-174. Line-haul Travel from SCAB Border to CA Border 2030 - All Scenarios

Parameters	**Peak Day Train Travel**	**Peak Daily Work Done by Line Haul Locomotives***
Segments	(gross ton-mi/day)	(hp-hr/day)
BNSF Cajon	2,686,924	66,467
UP Yuma	2,046,681	50,629
UP Mojave	180,590	4,467

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-175. China Shipping Switchers In-yard Activity 2030 - All Scenarios

	2030
Activity/Yards	**Peak Day Work Done by Switchers (hp-hr/day)***
On-site (In terminal) Activity	703
China Shipping-Related Off-dock Activity	
UP ICTF Yard	452
BNSF Hobart & Commerce Yards	476
UP East LA Yard	24
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2030

Table B1-176. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2030

Year	Type	Subdivision	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Alameda Corridor	8,650	2.086	24.409	60.805	0.095	1.242	1.242	1.180	9,420	0.763	0.248
2030	Line-Haul Travel	East River Bank	645	0.156	1.820	4.534	0.007	0.093	0.093	0.088	702	0.057	0.018
2030	Line-Haul Travel	BNSF San Bernardino	23,428	5.650	66.113	164.691	0.258	3.365	3.365	3.196	25,516	2.066	0.671
2030	Line-Haul Travel	BNSF Cajon	8,630	2.081	24.354	60.666	0.095	1.240	1.240	1.177	9,399	0.761	0.247
2030	Line-Haul Travel	UP Los Angeles	8,349	2.013	23.559	58.686	0.092	1.199	1.199	1.139	9,092	0.736	0.239
2030	Line-Haul Travel	UP Alhambra	8,756	2.112	24.710	61.554	0.096	1.258	1.258	1.194	9,537	0.772	0.251
2030	Line-Haul Travel	UP Yuma	9,713	2.342	27.409	68.278	0.107	1.395	1.395	1.325	10,578	0.857	0.278
2030	Line-Haul Travel	UP Mojave	680	0.164	1.918	4.779	0.007	0.098	0.098	0.093	740	0.060	0.019

Table B1-177. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2030

Year	Type	Segment	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	BNSF Cajon	66,467	16.030	187.563	467.228	0.732	9.546	9.546	9.067	72,388	5.861	1.905
2030	Line-Haul Travel	UP Yuma	50,629	12.210	142.870	355.896	0.557	7.272	7.272	6.906	55,139	4.465	1.451
2030	Line-Haul Travel	UP Mojave	4,467	1.077	12.606	31.403	0.049	0.642	0.642	0.609	4,865	0.394	0.128

Table B1-178. Line-haul Travel Total Peak Daily Emissions (lbs/day) 2030

Year	Type	Region	Peak Day Work from Locomotives (hp-hr/day)	Peak Daily Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Within SCAB boundaries	68,851	17	194	484	1	10	10	9	74,985	6	2
2030	Line-Haul Travel	Between SCAB Boundar	121,563	29	343	855	1	17	17	17	132,392	11	3

Peaking Factor:	246.953

Annual Emissions (tons/yr):

Table B1-179. Line-haul Travel Within SCAB Boundaries Annual Emissions 2030

Year	Type	Subdivision	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Alameda Corridor	2,136,120	0.258	3.014	7.508	0.012	0.153	0.153	0.146	1,163.206	0.094	0.031
2030	Line-Haul Travel	East River Bank	159,290	0.019	0.225	0.560	0.001	0.011	0.011	0.011	86.740	0.007	0.002
2030	Line-Haul Travel	BNSF San Bernardino	5,785,741	0.698	8.163	20.335	0.032	0.415	0.415	0.395	3,150.577	0.255	0.083
2030	Line-Haul Travel	BNSF Cajon	2,131,261	0.257	3.007	7.491	0.012	0.153	0.153	0.145	1,160.560	0.094	0.031
2030	Line-Haul Travel	UP Los Angeles	2,061,708	0.249	2.909	7.246	0.011	0.148	0.148	0.141	1,122.686	0.091	0.030
2030	Line-Haul Travel	UP Alhambra	2,162,439	0.261	3.051	7.600	0.012	0.155	0.155	0.147	1,177.538	0.095	0.031
2030	Line-Haul Travel	UP Yuma	2,398,668	0.289	3.384	8.431	0.013	0.172	0.172	0.164	1,306.175	0.106	0.034
2030	Line-Haul Travel	UP Mojave	167,879	0.020	0.237	0.590	0.001	0.012	0.012	0.011	91.417	0.007	0.002

Table B1-180. Line-haul Between SCAB Boundaries and CA Border Annual Emissions 2030

Year	Type	Segment	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	BNSF Cajon	16,414,148	1.979	23.160	57.692	0.090	1.179	1.179	1.120	8,938.187	0.724	0.235
2030	Line-Haul Travel	UP Yuma	12,502,972	1.508	17.641	43.945	0.069	0.898	0.898	0.853	6,808.389	0.551	0.179
2030	Line-Haul Travel	UP Mojave	1,103,203	0.133	1.557	3.877	0.006	0.079	0.079	0.075	600.740	0.049	0.016

Table B1-181. Line-haul Travel Total Annual Emissions (tons/yr) 2030

Year	Type	Region	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Within SCAB boundaries	17,003,105	2.050	23.991	59.762	0.094	1.221	1.221	1.160	9,258.898	0.750	0.244
2030	Line-Haul Travel	Between SCAB Boundar	30,020,323	3.620	42.357	105.514	0.165	2.156	2.156	2.047	16,347.316	1.324	0.430

One Hour Peak Emissions (lbs/hr):

Table B1-182. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2030

Year	Type	Subdivision	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Alameda Corridor	360.41	0.09	1.02	2.53	0.00	0.05	0.05	0.05	392.52	0.03	0.01
2030	Line-Haul Travel	East River Bank	26.88	0.01	0.08	0.19	0.00	0.00	0.00	0.00	29.27	0.00	0.00
2030	Line-Haul Travel	BNSF San Bernardino	976.19	0.24	2.75	6.86	0.01	0.14	0.14	0.13	1,063.15	0.09	0.03
2030	Line-Haul Travel	BNSF Cajon	359.59	0.09	1.01	2.53	0.00	0.05	0.05	0.05	391.63	0.03	0.01
2030	Line-Haul Travel	UP Los Angeles	347.86	0.08	0.98	2.45	0.00	0.05	0.05	0.05	378.85	0.03	0.01
2030	Line-Haul Travel	UP Alhambra	364.85	0.09	1.03	2.56	0.00	0.05	0.05	0.05	397.35	0.03	0.01
2030	Line-Haul Travel	UP Yuma	404.71	0.10	1.14	2.84	0.00	0.06	0.06	0.06	440.76	0.04	0.01
2030	Line-Haul Travel	UP Mojave	28.32	0.01	0.08	0.20	0.00	0.00	0.00	0.00	30.85	0.00	0.00

Table B1-183. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2030

Year	Type	Segment	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	BNSF Cajon	2,769.44	0.67	7.82	19.47	0.03	0.40	0.40	0.38	3,016.15	0.24	0.08
2030	Line-Haul Travel	UP Yuma	2,109.54	0.51	5.95	14.83	0.02	0.30	0.30	0.29	2,297.46	0.19	0.06
2030	Line-Haul Travel	UP Mojave	186.14	0.04	0.53	1.31	0.00	0.03	0.03	0.03	202.72	0.02	0.01

Table B1-184. Line-haul Travel Total Peak Hourly Emissions 2030

Year	Type	Region	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Within SCAB boundaries	2,869	0.692	8.096	20.166	0.032	0.412	0.412	0.391	3,124.374	0.253	0.082
2030	Line-Haul Travel	Between SCAB Boundar	5,065	1.222	14.293	35.605	0.056	0.727	0.727	0.691	5,516.329	0.447	0.145

Eight-Hour Peak Period Emissions (lbs/hr):

Table B1-185. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2030

Year	Type	Subdivision	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Alameda Corridor	2,883.30	0.70	8.14	20.27	0.03	0.41	0.41	0.39	3,140.15	0.25	0.08
2030	Line-Haul Travel	East River Bank	215.01	0.05	0.61	1.51	0.00	0.03	0.03	0.03	234.16	0.02	0.01
2030	Line-Haul Travel	BNSF San Bernardino	7,809.49	1.88	22.04	54.90	0.09	1.12	1.12	1.07	8,505.19	0.69	0.22
2030	Line-Haul Travel	BNSF Cajon	2,876.74	0.69	8.12	20.22	0.03	0.41	0.41	0.39	3,133.01	0.25	0.08
2030	Line-Haul Travel	UP Los Angeles	2,782.86	0.67	7.85	19.56	0.03	0.40	0.40	0.38	3,030.76	0.25	0.08
2030	Line-Haul Travel	UP Alhambra	2,918.82	0.70	8.24	20.52	0.03	0.42	0.42	0.40	3,178.84	0.26	0.08
2030	Line-Haul Travel	UP Yuma	3,237.68	0.78	9.14	22.76	0.04	0.47	0.47	0.44	3,526.10	0.29	0.09
2030	Line-Haul Travel	UP Mojave	226.60	0.05	0.64	1.59	0.00	0.03	0.03	0.03	246.79	0.02	0.01

Table B1-186. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2030

Year	Type	Segment	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	BNSF Cajon	22,155.53	5.34	62.52	155.74	0.24	3.18	3.18	3.02	24,129.21	1.95	0.63
2030	Line-Haul Travel	UP Yuma	16,876.29	4.07	47.62	118.63	0.19	2.42	2.42	2.30	18,379.69	1.49	0.48
2030	Line-Haul Travel	UP Mojave	1,489.08	0.36	4.20	10.47	0.02	0.21	0.21	0.20	1,621.74	0.13	0.04

Table B1-187. Line-haul Travel Total 8-hr Peak Period Emissions 2030

Year	Type	Region	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul Travel	Within SCAB boundaries	22,950	5.535	64.764	161.331	0.253	3.296	3.296	3.131	24,994.994	2.024	0.658
2030	Line-Haul Travel	Between SCAB Boundar	40,521	9.772	114.347	284.842	0.446	5.820	5.820	5.527	44,130.635	3.573	1.161

Analysis Year:	2030

Table B1-188. Line-haul In-yard Peak Daily Emissions (lbs/day) 2030

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Line Haul In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul	WBCT (On-Site)	8,823	2.128	24.898	62.021	0.097	1.267	1.267	1.204	9,608.969	0.778	0.253
2030	Line-Haul	UP ICTF Yard	5,930	1.430	16.734	41.686	0.065	0.852	0.852	0.809	6,458.378	0.523	0.170
2030	Line-Haul	BNSF Hobart & Commerce Yards	6,242	1.505	17.615	43.880	0.069	0.897	0.897	0.851	6,798.292	0.550	0.179
2030	Line-Haul	UP East LA Yard	312	0.075	0.881	2.194	0.003	0.045	0.045	0.043	339.915	0.028	0.009
2030	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**12,484**	3.01	35.23	87.76	0.14	1.79	1.79	1.70	13,596.58	1.10	0.36

Table B1-189. Line-haul In-yard Annual Emissions (tons/yr) 2030

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Line Haul In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul	WBCT (On-Site)	2,178,867	0.263	3.074	7.658	0.012	0.156	0.156	0.149	1,186.484	0.096	0.031
2030	Line-Haul	UP ICTF Yard	1,464,459	0.177	2.066	5.147	0.008	0.105	0.105	0.100	797.459	0.065	0.021
2030	Line-Haul	BNSF Hobart & Commerce Yards	1,541,536	0.186	2.175	5.418	0.008	0.111	0.111	0.105	839.431	0.068	0.022
2030	Line-Haul	UP East LA Yard	77,077	0.009	0.109	0.271	0.000	0.006	0.006	0.005	41.972	0.003	0.001
2030	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**3,083,073**	0.37	4.35	10.84	0.02	0.22	0.22	0.21	1,678.86	0.14	0.04

Peaking Factor:	246.953

Table B1-190. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2030

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Peak Line Haul In-Yard Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul	WBCT (On-Site)	367.62	0.089	1.037	2.584	0.004	0.053	0.053	0.050	400.374	0.032	0.011
2030	Line-Haul	UP ICTF Yard	247.09	0.060	0.697	1.737	0.003	0.035	0.035	0.034	269.099	0.022	0.007
2030	Line-Haul	BNSF Hobart & Commerce Yards	260.09	0.063	0.734	1.828	0.003	0.037	0.037	0.035	283.262	0.023	0.007
2030	Line-Haul	UP East LA Yard	13.00	0.003	0.037	0.091	0.000	0.002	0.002	0.002	14.163	0.001	0.000
2030	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**520**	0.13	1.47	3.66	0.01	0.07	0.07	0.07	566.52	0.05	0.01

Table B1-191. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2030

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Line Haul In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Line-Haul	WBCT (On-Site)	2,941.00	0.709	8.299	20.674	0.032	0.422	0.422	0.401	3,202.990	0.259	0.084
2030	Line-Haul	UP ICTF Yard	1,976.70	0.477	5.578	13.895	0.022	0.284	0.284	0.270	2,152.793	0.174	0.057
2030	Line-Haul	BNSF Hobart & Commerce Yards	2,080.74	0.502	5.872	14.627	0.023	0.299	0.299	0.284	2,266.097	0.183	0.060
2030	Line-Haul	UP East LA Yard	104.04	0.025	0.294	0.731	0.001	0.015	0.015	0.014	113.305	0.009	0.003
2030	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**4,161**	1.00	11.74	29.25	0.05	0.60	0.60	0.57	4,532.19	0.37	0.12

Analysis Year:	2030

Table B1-192. Switchers In-yard Peak Daily Emissions (lbs/day) 2030

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Switcher In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Switchers	WBCT (On-Site)	703	0.374	2.795	6.827	0.009	0.058	0.058	0.053	1,038.048	0.078	0.026
2030	Switchers	UP ICTF Yard	452	0.240	1.796	4.386	0.006	0.037	0.037	0.034	666.894	0.050	0.017
2030	Switchers	BNSF Hobart & Commerce Yards	476	0.253	1.890	4.617	0.006	0.039	0.039	0.036	701.994	0.052	0.018
2030	Switchers	UP East LA Yard	24	0.013	0.095	0.231	0.000	0.002	0.002	0.002	35.100	0.003	0.001
2030	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**951**	0.51	3.78	9.23	0.01	0.08	0.08	0.07	1,403.99	0.10	0.04

Table B1-193. Switchers In-yard Annual Emissions (tons/yr) 2030

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Switcher In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Switchers	WBCT (On-Site)	173,709	0.046	0.345	0.843	0.001	0.007	0.007	0.007	128.175	0.010	0.003
2030	Switchers	UP ICTF Yard	111,599	0.030	0.222	0.542	0.001	0.005	0.005	0.004	82.346	0.006	0.002
2030	Switchers	BNSF Hobart & Commerce Yards	117,473	0.031	0.233	0.570	0.001	0.005	0.005	0.004	86.680	0.006	0.002
2030	Switchers	UP East LA Yard	5,874	0.002	0.012	0.029	0.000	0.000	0.000	0.000	4.334	0.000	0.000
2030	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**234,946**	0.06	0.47	1.14	0.00	0.01	0.01	0.01	173.36	0.01	0.00

Peaking Factor:	246.953

Table B1-194. Switchers In-yard Peak Hour Emissions (lbs/hr) 2030

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Switcher In-Yard Peak Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Switchers	WBCT (On-Site)	29.31	0.016	0.116	0.284	0.000	0.002	0.002	0.002	43.252	0.003	0.001
2030	Switchers	UP ICTF Yard	18.83	0.010	0.075	0.183	0.000	0.002	0.002	0.001	27.787	0.002	0.001
2030	Switchers	BNSF Hobart & Commerce Yards	19.82	0.011	0.079	0.192	0.000	0.002	0.002	0.002	29.250	0.002	0.001
2030	Switchers	UP East LA Yard	0.99	0.001	0.004	0.010	0.000	0.000	0.000	0.000	1.462	0.000	0.000
2030	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**40**	0.02	0.16	0.38	0.00	0.00	0.00	0.00	58.50	0.00	0.00

Table B1-195. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2030

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Switcher In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2030	Switchers	WBCT (On-Site)	234.47	0.125	0.932	2.276	0.003	0.019	0.019	0.018	346.016	0.026	0.009
2030	Switchers	UP ICTF Yard	150.63	0.080	0.599	1.462	0.002	0.012	0.012	0.011	222.298	0.017	0.006
2030	Switchers	BNSF Hobart & Commerce Yards	158.56	0.084	0.630	1.539	0.002	0.013	0.013	0.012	233.998	0.017	0.006
2030	Switchers	UP East LA Yard	7.93	0.004	0.032	0.077	0.000	0.001	0.001	0.001	11.700	0.001	0.000
2030	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2030	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**317**	0.17	1.26	3.08	0.00	0.03	0.03	0.02	468.00	0.03	0.01

Year	2036

Table B1-196. On -site Rail Operations 2036 - All Scenarios

Parameters	2036	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.980	1.260
Average hours of operation per visit	1.5	1.5
Number of locomotives per train	4	1
Average HP of locomotive	4,000	4,000
Average Load Factor	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	16

On-site Switchers	WBCT
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.08
Fuel Type (diesel S content in ppm)*	15

Table B1-197. China Shipping On -site Switching Activity 2036 - All Scenarios

Activity	2036
Annual Throughput WBCT	3,569,909
China Shipping Fraction of Throughput	0.48
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**632**

Table B1-198. Off -site Rail Operations 2036 - All Scenarios

Parameters	2036					
	Train Length (ft)					
	12,000	10,000	8,000	8,813	6,000	2,000
Line-Hauls Travelling within SCAB						
Peak Month Daily Train-miles in SCAB Region (miles/day)						
Alameda Corridor		3.7	7.5	26.3		10.6
East River Bank		0.5	1.1	1.3		
BNSF San Bernardino		19.8	40.2	48.6		
BNSF Cajon		7.5	15.1	17.4		
UP Los Angeles		7.3	14.8	16.6		
UP Alhambra		7.6	15.3	17.7		
UP Yuma		8.4	17.0	19.6		
UP Mojave		0.6	1.2	1.4		
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Off-dock In-yard Linehaul Activity						
Average # of train visits per day						
UP ICTF Yard		0.3	0.5			
BNSF Hobart & Commerce Yards		0.3	0.6			
UP East LA Yard		0.0	0.0			
UP LATC Yard						
UP COI Yard						
BNSF SB Yard						
BNSF SCIG Yard						
Average hours of operation per visit	1.5	1.5	1.5	1.5	1.5	1.5
Number of locomotives per train	6	5	4	4	3	1
Average HP of locomotive	4,000	4,000	4,000	4,000	4,000	4,000
Average Load Factor	0.28	0.28	0.28	0.28	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	15	15	16	17	18
Line-Hauls Travelling from SCAB border to CA border						
Average # of train visits per day						
BNSF Cajon		0.3	0.6	0.7		na
UP Yuma		0.2	0.5	0.6		na
UP Mojave		0.0	0.0	0.0		na
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Average travel distance (miles/train)						
BNSF Cajon	191	191	191	191	191	191
UP Yuma	184	184	184	184	184	184
UP Mojave	184	184	184	184	184	184

Off-site Switchers In-yard	
China Shipping-related Annual Throughput in Off-dock RailYard (TEUs)	
UP ICTF Yard	153,068
BNSF Hobart & Commerce Yards	161,125
UP East LA Yard	8,056
UP LATC Yard	0
UP COI Yard	0
BNSF SB Yard	0
BNSF SCIG Yard	0
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.083
Fuel Type (diesel S content in ppm)*	15

* Based on data collected during development of the 2001 POLA emissions inventory

Table B1-199. China Shipping Line-haul In-yard Activity 2036 - All Scenarios

Parameters	2036 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	8,821
China Shipping Related Off-dock Activity	
UP ICTF Yard	5,930
BNSF Hobart & Commerce Yards	6,242
UP East LA Yard	312
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-200. China Shipping Linehaul Traveling 2036 - All Scenarios

	2036
Fuel Productivity Factor (gross ton-miles/gal)	893

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each year.
Source: From ARB, Locomotive Inventory Update: Line Haul Activity (2014).

Fuel Consumption Rate (bhp-hr/gal):	20.80

Source: EPA (2009), Emission Factors for Locomotives.

Table B1-201. Line-haul Travel within SCAB 2036 - All Scenarios

Parameters	**Peak Day Train Travel**	**Peak Daily Work Done by Line Haul Locomotives ***
Subdivisions	(gross ton-mi/day)	(hp-hr/day)
Alameda Corridor	349,583	8,146
East River Bank	26,075	608
BNSF San Bernardino	947,100	22,071
BNSF Cajon	348,878	8,130
UP Los Angeles	337,492	7,865
UP Alhambra	353,982	8,249
UP Yuma	392,651	9,150
UP Mojave	27,481	640

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-202. Line-haul Travel from SCAB Border to CA Border 2036 - All Scenarios

Parameters	**Peak Day Train Travel**	**Peak Daily Work Done by Line Haul Locomotives***
Segments	(gross ton-mi/day)	(hp-hr/day)
BNSF Cajon	2,686,923	62,615
UP Yuma	2,046,681	47,695
UP Mojave	180,590	4,208

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-203. China Shipping Switchers In-yard Activity 2036 - All Scenarios

	2036
Activity/Yards	**Peak Day Work Done by Switchers (hp-hr/day)***
On-site (In terminal) Activity	632
China Shipping-Related Off-dock Activity	
UP ICTF Yard	406
BNSF Hobart & Commerce Yards	428
UP East LA Yard	21
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2036

Table B1-204. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2036

Year	Type	Subdivision	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Alameda Corridor	8,146	1.316	22.989	39.057	0.090	0.702	0.702	0.683	8,872	0.718	0.233
2036	Line-Haul Travel	East River Bank	608	0.098	1.715	2.913	0.007	0.052	0.052	0.051	662	0.054	0.017
2036	Line-Haul Travel	BNSF San Bernardino	22,071	3.565	62.282	105.813	0.243	1.903	1.903	1.850	24,037	1.946	0.633
2036	Line-Haul Travel	BNSF Cajon	8,130	1.313	22.942	38.978	0.090	0.701	0.701	0.682	8,854	0.717	0.233
2036	Line-Haul Travel	UP Los Angeles	7,865	1.270	22.194	37.706	0.087	0.678	0.678	0.659	8,565	0.694	0.225
2036	Line-Haul Travel	UP Alhambra	8,249	1.333	23.278	39.548	0.091	0.711	0.711	0.692	8,984	0.727	0.236
2036	Line-Haul Travel	UP Yuma	9,150	1.478	25.821	43.868	0.101	0.789	0.789	0.767	9,965	0.807	0.262
2036	Line-Haul Travel	UP Mojave	640	0.103	1.807	3.070	0.007	0.055	0.055	0.054	697	0.056	0.018

Table B1-205. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2036

Year	Type	Segment	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	BNSF Cajon	62,615	10.115	176.693	300.192	0.689	5.399	5.399	5.249	68,192	5.522	1.795
2036	Line-Haul Travel	UP Yuma	47,695	7.704	134.590	228.662	0.525	4.113	4.113	3.998	51,943	4.206	1.367
2036	Line-Haul Travel	UP Mojave	4,208	0.680	11.876	20.176	0.046	0.363	0.363	0.353	4,583	0.371	0.121

Table B1-206. Line-haul Travel Total Peak Daily Total Emissions (lbs/day) 2036

Year	Type	Region	Peak Day Work from Locomotives (hp-hr/day)	Peak Daily Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Within SCAB boundaries	64,859	10	183	311	1	6	6	5	70,637	6	2
2036	Line-Haul Travel	Between SCAB Boundar	114,518	18	323	549	1	10	10	10	124,719	10	3

Peaking Factor:	246.953

Annual Emissions (tons/yr):

Table B1-207. Line-haul Travel Within SCAB Boundaries Annual Emissions 2036

Year	Type	Subdivision	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Alameda Corridor	2,011,803	0.162	2.839	4.823	0.011	0.087	0.087	0.084	1,095.510	0.089	0.029
2036	Line-Haul Travel	East River Bank	150,058	0.012	0.212	0.360	0.001	0.006	0.006	0.006	81.713	0.007	0.002
2036	Line-Haul Travel	BNSF San Bernardino	5,450,430	0.440	7.690	13.065	0.030	0.235	0.235	0.228	2,967.986	0.240	0.078
2036	Line-Haul Travel	BNSF Cajon	2,007,744	0.162	2.833	4.813	0.011	0.087	0.087	0.084	1,093.300	0.089	0.029
2036	Line-Haul Travel	UP Los Angeles	1,942,222	0.157	2.740	4.656	0.011	0.084	0.084	0.081	1,057.621	0.086	0.028
2036	Line-Haul Travel	UP Alhambra	2,037,115	0.165	2.874	4.883	0.011	0.088	0.088	0.085	1,109.294	0.090	0.029
2036	Line-Haul Travel	UP Yuma	2,259,654	0.183	3.188	5.417	0.012	0.097	0.097	0.095	1,230.476	0.100	0.032
2036	Line-Haul Travel	UP Mojave	158,149	0.013	0.223	0.379	0.001	0.007	0.007	0.007	86.119	0.007	0.002

Table B1-208. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2036

Year	Type	Segment	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	BNSF Cajon	15,462,868	1.249	21.817	37.067	0.085	0.667	0.667	0.648	8,420.175	0.682	0.222
2036	Line-Haul Travel	UP Yuma	11,778,363	0.951	16.619	28.234	0.065	0.508	0.508	0.494	6,413.809	0.519	0.169
2036	Line-Haul Travel	UP Mojave	1,039,267	0.084	1.466	2.491	0.006	0.045	0.045	0.044	565.924	0.046	0.015

Table B1-209. Line-haul Travel Total Annual Emissions (tons/yr) 2036

Year	Type	Region	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Within SCAB boundaries	16,017,175	1.294	22.600	38.395	0.088	0.691	0.691	0.671	8,722.019	0.706	0.230
2036	Line-Haul Travel	Between SCAB Boundar	28,280,498	2.284	39.903	67.792	0.156	1.219	1.219	1.185	15,399.909	1.247	0.405

One Hour Peak Emissions (lbs/hr):

Table B1-210. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2036

Year	Type	Subdivision	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Alameda Corridor	339.44	0.05	0.96	1.63	0.00	0.03	0.03	0.03	369.68	0.03	0.01
2036	Line-Haul Travel	East River Bank	25.32	0.00	0.07	0.12	0.00	0.00	0.00	0.00	27.57	0.00	0.00
2036	Line-Haul Travel	BNSF San Bernardino	919.61	0.15	2.60	4.41	0.01	0.08	0.08	0.08	1,001.53	0.08	0.03
2036	Line-Haul Travel	BNSF Cajon	338.75	0.05	0.96	1.62	0.00	0.03	0.03	0.03	368.93	0.03	0.01
2036	Line-Haul Travel	UP Los Angeles	327.70	0.05	0.92	1.57	0.00	0.03	0.03	0.03	356.89	0.03	0.01
2036	Line-Haul Travel	UP Alhambra	343.71	0.06	0.97	1.65	0.00	0.03	0.03	0.03	374.33	0.03	0.01
2036	Line-Haul Travel	UP Yuma	381.26	0.06	1.08	1.83	0.00	0.03	0.03	0.03	415.22	0.03	0.01
2036	Line-Haul Travel	UP Mojave	26.68	0.00	0.08	0.13	0.00	0.00	0.00	0.00	29.06	0.00	0.00

Table B1-211. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2036

Year	Type	Segment	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	BNSF Cajon	2,608.94	0.42	7.36	12.51	0.03	0.22	0.22	0.22	2,841.35	0.23	0.07
2036	Line-Haul Travel	UP Yuma	1,987.28	0.32	5.61	9.53	0.02	0.17	0.17	0.17	2,164.31	0.18	0.06
2036	Line-Haul Travel	UP Mojave	175.35	0.03	0.49	0.84	0.00	0.02	0.02	0.01	190.97	0.02	0.01

Table B1-212. Line-haul Travel Total Peak Hourly Emissions 2036

Year	Type	Region	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Within SCAB boundaries	2,702	0.437	7.626	12.956	0.030	0.233	0.233	0.227	2,943.207	0.238	0.077
2036	Line-Haul Travel	Between SCAB Boundar	4,772	0.771	13.465	22.876	0.053	0.411	0.411	0.400	5,196.631	0.421	0.137

Eight-Hour Peak Period Emissions (lbs/hr):

Table B1-213. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2036

Year	Type	Subdivision	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Alameda Corridor	2,715.50	0.44	7.66	13.02	0.03	0.23	0.23	0.23	2,957.40	0.24	0.08
2036	Line-Haul Travel	East River Bank	202.55	0.03	0.57	0.97	0.00	0.02	0.02	0.02	220.59	0.02	0.01
2036	Line-Haul Travel	BNSF San Bernardino	7,356.89	1.19	20.76	35.27	0.08	0.63	0.63	0.62	8,012.27	0.65	0.21
2036	Line-Haul Travel	BNSF Cajon	2,710.02	0.44	7.65	12.99	0.03	0.23	0.23	0.23	2,951.44	0.24	0.08
2036	Line-Haul Travel	UP Los Angeles	2,621.58	0.42	7.40	12.57	0.03	0.23	0.23	0.22	2,855.12	0.23	0.08
2036	Line-Haul Travel	UP Alhambra	2,749.66	0.44	7.76	13.18	0.03	0.24	0.24	0.23	2,994.61	0.24	0.08
2036	Line-Haul Travel	UP Yuma	3,050.04	0.49	8.61	14.62	0.03	0.26	0.26	0.26	3,321.75	0.27	0.09
2036	Line-Haul Travel	UP Mojave	213.47	0.03	0.60	1.02	0.00	0.02	0.02	0.02	232.48	0.02	0.01

Table B1-214. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2036

Year	Type	Segment	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	BNSF Cajon	20,871.50	3.37	58.90	100.06	0.23	1.80	1.80	1.75	22,730.81	1.84	0.60
2036	Line-Haul Travel	UP Yuma	15,898.23	2.57	44.86	76.22	0.18	1.37	1.37	1.33	17,314.49	1.40	0.46
2036	Line-Haul Travel	UP Mojave	1,402.78	0.23	3.96	6.73	0.02	0.12	0.12	0.12	1,527.75	0.12	0.04

Table B1-215. Line-haul Travel Total 8-hr Peak Period Emissions 2036

Year	Type	Region	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul Travel	Within SCAB boundaries	21,620	3.492	61.009	103.651	0.238	1.864	1.864	1.812	23,545.653	1.907	0.620
2036	Line-Haul Travel	Between SCAB Boundar	38,173	6.166	107.720	183.010	0.420	3.292	3.292	3.200	41,573.048	3.366	1.094

Analysis Year:	2036

Table B1-216. Line-haul In-yard Peak Daily Emissions (lbs/day) 2036

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Line Haul In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul	WBCT (On-Site)	8,821	1.425	24.892	42.290	0.097	0.761	0.761	0.739	9,606.630	0.778	0.253
2036	Line-Haul	UP ICTF Yard	5,930	0.958	16.734	28.431	0.065	0.511	0.511	0.497	6,458.378	0.523	0.170
2036	Line-Haul	BNSF Hobart & Commerce Yards	6,242	1.008	17.615	29.927	0.069	0.538	0.538	0.523	6,798.292	0.550	0.179
2036	Line-Haul	UP East LA Yard	312	0.050	0.881	1.496	0.003	0.027	0.027	0.026	339.915	0.028	0.009
2036	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**12,484**	2.02	35.23	59.85	0.14	1.08	1.08	1.05	13,596.58	1.10	0.36

Table B1-217. Line-haul In-yard Annual Emissions (tons/yr) 2036

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Line Haul In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul	WBCT (On-Site)	2,178,337	0.176	3.074	5.222	0.012	0.094	0.094	0.091	1,186.195	0.096	0.031
2036	Line-Haul	UP ICTF Yard	1,464,459	0.118	2.066	3.511	0.008	0.063	0.063	0.061	797.459	0.065	0.021
2036	Line-Haul	BNSF Hobart & Commerce Yards	1,541,536	0.125	2.175	3.695	0.008	0.066	0.066	0.065	839.431	0.068	0.022
2036	Line-Haul	UP East LA Yard	77,077	0.006	0.109	0.185	0.000	0.003	0.003	0.003	41.972	0.003	0.001
2036	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**3,083,073**	0.25	4.35	7.39	0.02	0.13	0.13	0.13	1,678.86	0.14	0.04

Peaking Factor:	246.953

Table B1-218. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2036

			Peak Hour Work	1-hr Peak Line Haul In-Yard Emissions (lbs/hr)									
Year	Type	Rail Yard	hp-hrs	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul	WBCT (On-Site)	367.54	0.059	1.037	1.762	0.004	0.032	0.032	0.031	400.276	0.032	0.011
2036	Line-Haul	UP ICTF Yard	247.09	0.040	0.697	1.185	0.003	0.021	0.021	0.021	269.099	0.022	0.007
2036	Line-Haul	BNSF Hobart & Commerce Yards	260.09	0.042	0.734	1.247	0.003	0.022	0.022	0.022	283.262	0.023	0.007
2036	Line-Haul	UP East LA Yard	13.00	0.002	0.037	0.062	0.000	0.001	0.001	0.001	14.163	0.001	0.000
2036	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**520**	0.08	1.47	2.49	0.01	0.04	0.04	0.04	566.52	0.05	0.01

Table B1-219. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2036

			Peak 8hr Period	8-hr Peak Line Haul In-Yard Emissions (lbs/8-hr period)									
Year	Type	Rail Yard	hp-hrs	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Line-Haul	WBCT (On-Site)	2,940.28	0.475	8.297	14.097	0.032	0.254	0.254	0.246	3,202.210	0.259	0.084
2036	Line-Haul	UP ICTF Yard	1,976.70	0.319	5.578	9.477	0.022	0.170	0.170	0.166	2,152.793	0.174	0.057
2036	Line-Haul	BNSF Hobart & Commerce Yards	2,080.74	0.336	5.872	9.976	0.023	0.179	0.179	0.174	2,266.097	0.183	0.060
2036	Line-Haul	UP East LA Yard	104.04	0.017	0.294	0.499	0.001	0.009	0.009	0.009	113.305	0.009	0.003
2036	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**4,161**	0.67	11.74	19.95	0.05	0.36	0.36	0.35	4,532.19	0.37	0.12

Analysis Year:	2036

Table B1-220. Switchers In-yard Peak Daily Emissions (lbs/day) 2036

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Switcher In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Switchers	WBCT (On-Site)	632	0.336	2.513	6.138	0.008	0.052	0.052	0.048	933.235	0.070	0.023
2036	Switchers	UP ICTF Yard	406	0.216	1.614	3.943	0.005	0.033	0.033	0.031	599.557	0.045	0.015
2036	Switchers	BNSF Hobart & Commerce Yards	428	0.227	1.699	4.151	0.006	0.035	0.035	0.032	631.112	0.047	0.016
2036	Switchers	UP East LA Yard	21	0.011	0.085	0.208	0.000	0.002	0.002	0.002	31.556	0.002	0.001
2036	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**855**	0.45	3.40	8.30	0.01	0.07	0.07	0.06	1,262.22	0.09	0.03

Table B1-221. Switchers In-yard Annual Emissions (tons/yr) 2036

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Switcher In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Switchers	WBCT (On-Site)	156,169	0.041	0.310	0.758	0.001	0.006	0.006	0.006	115.233	0.009	0.003
2036	Switchers	UP ICTF Yard	100,331	0.027	0.199	0.487	0.001	0.004	0.004	0.004	74.031	0.006	0.002
2036	Switchers	BNSF Hobart & Commerce Yards	105,611	0.028	0.210	0.513	0.001	0.004	0.004	0.004	77.928	0.006	0.002
2036	Switchers	UP East LA Yard	5,281	0.001	0.010	0.026	0.000	0.000	0.000	0.000	3.896	0.000	0.000
2036	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**211,223**	0.06	0.42	1.03	0.00	0.01	0.01	0.01	155.86	0.01	0.00

Peaking Factor:	246.953

Table B1-222. Switchers In-yard Peak Hour Emissions (lbs/hr) 2036

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Switcher In-Yard Peak Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Switchers	WBCT (On-Site)	26.35	0.014	0.105	0.256	0.000	0.002	0.002	0.002	38.885	0.003	0.001
2036	Switchers	UP ICTF Yard	16.93	0.009	0.067	0.164	0.000	0.001	0.001	0.001	24.982	0.002	0.001
2036	Switchers	BNSF Hobart & Commerce Yards	17.82	0.009	0.071	0.173	0.000	0.001	0.001	0.001	26.296	0.002	0.001
2036	Switchers	UP East LA Yard	0.89	0.000	0.004	0.009	0.000	0.000	0.000	0.000	1.315	0.000	0.000
2036	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**36**	0.02	0.14	0.35	0.00	0.00	0.00	0.00	52.59	0.00	0.00

Table B1-223. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2036

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Switcher In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2036	Switchers	WBCT (On-Site)	210.79	0.112	0.838	2.046	0.003	0.017	0.017	0.016	311.078	0.023	0.008
2036	Switchers	UP ICTF Yard	135.42	0.072	0.538	1.314	0.002	0.011	0.011	0.010	199.852	0.015	0.005
2036	Switchers	BNSF Hobart & Commerce Yards	142.55	0.076	0.566	1.384	0.002	0.012	0.012	0.011	210.371	0.016	0.005
2036	Switchers	UP East LA Yard	7.13	0.004	0.028	0.069	0.000	0.001	0.001	0.001	10.519	0.001	0.000
2036	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2036	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**285**	0.15	1.13	2.77	0.00	0.02	0.02	0.02	420.74	0.03	0.01

Year	2045

Table B1-224. On -site Rail Operations 2045 - All Scenarios

Parameters	2045	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.974	1.283
Average hours of operation per visit	1.5	1.5
Number of locomotives per train	4	1
Average HP of locomotive	4,000	4,000
Average Load Factor	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	16

On-site Switchers	WBCT
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.08
Fuel Type (diesel S content in ppm)*	15

Table B1-225. China Shipping On -site Switching Activity 2045 - All Scenarios

Activity	2045
Annual Throughput WBCT	3,569,909
China Shipping Fraction of Throughput	0.48
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**632**

Table B1-226. Off -site Rail Operations 2045 - All Scenarios

Parameters	2045 Train Length (ft) 12,000	10,000	8,000	8,813	6,000	2,000
Line-Hauls Travelling within SCAB						
Peak Month Daily Train-miles in SCAB Region (miles/day)						
Alameda Corridor		3.7	7.5	26.3		10.8
East River Bank		0.5	1.1	1.3		
BNSF San Bernardino		19.8	40.2	48.6		
BNSF Cajon		7.5	15.1	17.4		
UP Los Angeles		7.3	14.8	16.6		
UP Alhambra		7.6	15.3	17.7		
UP Yuma		8.4	17.0	19.6		
UP Mojave		0.6	1.2	1.4		
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Off-dock In-yard Linehaul Activity						
Average # of train visits per day						
UP ICTF Yard		0.3	0.5			
BNSF Hobart & Commerce Yards		0.3	0.6			
UP East LA Yard		0.0	0.0			
UP LATC Yard						
UP COI Yard						
BNSF SB Yard						
BNSF SCIG Yard						
Average hours of operation per visit	1.5	1.5	1.5	1.5	1.5	1.5
Number of locomotives per train	6	5	4	4	3	1
Average HP of locomotive	4,000	4,000	4,000	4,000	4,000	4,000
Average Load Factor	0.28	0.28	0.28	0.28	0.28	0.28
Fuel Type (diesel S content in ppm)*	15	15	15	16	17	18
Line-Hauls Travelling from SCAB border to CA border						
Average # of train visits per day						
BNSF Cajon		0.3	0.6	0.7		na
UP Yuma		0.2	0.5	0.6		na
UP Mojave		0.0	0.0	0.0		na
Locomotives per Train	6	5	4	4	3	1
Gross Train Weight (ton)	12000	10000	8000	8813	6000	2000
Fuel Type (diesel S content in ppm)*	15	15	15		15	
Average travel distance (miles/train)						
BNSF Cajon	191	191	191	191	191	191
UP Yuma	184	184	184	184	184	184
UP Mojave	184	184	184	184	184	184

Off-site Switchers In-yard	
China Shipping-related Annual Throughput in Off-dock RailYard (TEUs)	
UP ICTF Yard	153,068
BNSF Hobart & Commerce Yards	161,124
UP East LA Yard	8,056
UP LATC Yard	0
UP COI Yard	0
BNSF SB Yard	0
BNSF SCIG Yard	0
Average hours of operation per day	8
Average HP of locomotive	2,009
Average Load Factor	0.083
Fuel Type (diesel S content in ppm)*	15

* Based on data collected during development of the 2001 POLA emissions inventory

Table B1-227. Off-site Rail Operations 2045 - All Scenarios

Parameters	2045 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	8,820
China Shipping Related Off-dock Activity	
UP ICTF Yard	5,930
BNSF Hobart & Commerce Yards	6,242
UP East LA Yard	312
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-228. China Shipping Line -haul Traveling 2045 - All Scenarios

	2045
Fuel Productivity Factor (gross ton-miles/gal)	976

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each year.
Source: From ARB, Locomotive Inventory Update: Line Haul Activity (2014).

Fuel Consumption Rate (bhp-hr/gal):	20.80

Source: EPA (2009), Emission Factors for Locomotives.

Table B1-229. Line-haul Travel within SCAB 2045 - All Scenarios

Parameters	**Peak Day Train Travel**	**Peak Daily Work Done by Line Haul Locomotives ***
Subdivisions	(gross ton-mi/day)	(hp-hr/day)
Alameda Corridor	349,531	7,448
East River Bank	26,075	556
BNSF San Bernardino	947,100	20,180
BNSF Cajon	348,878	7,434
UP Los Angeles	337,492	7,191
UP Alhambra	353,982	7,542
UP Yuma	392,651	8,366
UP Mojave	27,481	586

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-230. Line-haul Travel from SCAB Border to CA Border 2045 - All Scenarios

Parameters	**Peak Day Train Travel**	**Peak Daily Work Done by Line Haul Locomotives***
Segments	(gross ton-mi/day)	(hp-hr/day)
BNSF Cajon	2,686,923	57,251
UP Yuma	2,046,681	43,609
UP Mojave	180,590	3,848

*Work from all linehaul locomotives operating with CS-related TEUs

Table B1-231. China Shipping Switchers In-yard Activity 2045 - All Scenarios

	2045
Activity/Yards	**Peak Day Work Done by Switchers (hp-hr/day)***
On-site (In terminal) Activity	632
China Shipping-Related Off-dock Activity	
UP ICTF Yard	406
BNSF Hobart & Commerce Yards	428
UP East LA Yard	21
UP LATC Yard	-
UP COI Yard	-
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2045

Table B1-232. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2045

Year	Type	Subdivision	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Alameda Corridor	7,448	0.758	21.016	20.863	0.082	0.319	0.319	0.319	8,111	0.657	0.213
2045	Line-Haul Travel	East River Bank	556	0.057	1.568	1.556	0.006	0.024	0.024	0.024	605	0.049	0.016
2045	Line-Haul Travel	BNSF San Bernardino	20,180	2.054	56.947	56.532	0.222	0.866	0.866	0.866	21,978	1.780	0.578
2045	Line-Haul Travel	BNSF Cajon	7,434	0.757	20.977	20.824	0.082	0.319	0.319	0.319	8,096	0.656	0.213
2045	Line-Haul Travel	UP Los Angeles	7,191	0.732	20.292	20.145	0.079	0.308	0.308	0.308	7,832	0.634	0.206
2045	Line-Haul Travel	UP Alhambra	7,542	0.768	21.284	21.129	0.083	0.323	0.323	0.323	8,214	0.665	0.216
2045	Line-Haul Travel	UP Yuma	8,366	0.852	23.609	23.437	0.092	0.359	0.359	0.359	9,112	0.738	0.240
2045	Line-Haul Travel	UP Mojave	586	0.060	1.652	1.640	0.006	0.025	0.025	0.025	638	0.052	0.017

Table B1-233. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2045

Year	Type	Segment	Peak Day Work from Locomotives (hp-hr/day)	Peak Day Emissions (lb/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	BNSF Cajon	57,251	5.827	161.557	160.381	0.631	2.455	2.455	2.455	62,351	5.049	1.641
2045	Line-Haul Travel	UP Yuma	43,609	4.439	123.061	122.165	0.480	1.870	1.870	1.870	47,494	3.846	1.250
2045	Line-Haul Travel	UP Mojave	3,848	0.392	10.858	10.779	0.042	0.165	0.165	0.165	4,191	0.339	0.110

Table B1-234. Line-haul Travel Peak Daily Total Emissions (lbs/day) 2045

Year	Type	Region	Peak Day Work from Locomotives (hp-hr/day)	Peak Daily Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Within SCAB boundaries	59,302	6	167	166	1	3	3	3	64,585	5	2
2045	Line-Haul Travel	Between SCAB Boundari	104,708	11	295	293	1	4	4	4	114,036	9	3

Peaking Factor:	246.953

Annual Emissions (tons/yr):

Table B1-235. Line-haul Travel Within SCAB Boundaries Annual Emissions 2045

Year	Type	Subdivision	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Alameda Corridor	1,839,197	0.094	2.595	2.576	0.010	0.039	0.039	0.039	1,001.519	0.081	0.026
2045	Line-Haul Travel	East River Bank	137,204	0.007	0.194	0.192	0.001	0.003	0.003	0.003	74.713	0.006	0.002
2045	Line-Haul Travel	BNSF San Bernardino	4,983,544	0.254	7.032	6.980	0.027	0.107	0.107	0.107	2,713.747	0.220	0.071
2045	Line-Haul Travel	BNSF Cajon	1,835,760	0.093	2.590	2.571	0.010	0.039	0.039	0.039	999.648	0.081	0.026
2045	Line-Haul Travel	UP Los Angeles	1,775,851	0.090	2.506	2.487	0.010	0.038	0.038	0.038	967.025	0.078	0.025
2045	Line-Haul Travel	UP Alhambra	1,862,615	0.095	2.628	2.609	0.010	0.040	0.040	0.040	1,014.271	0.082	0.027
2045	Line-Haul Travel	UP Yuma	2,066,091	0.105	2.915	2.894	0.011	0.044	0.044	0.044	1,125.073	0.091	0.030
2045	Line-Haul Travel	UP Mojave	144,602	0.007	0.204	0.203	0.001	0.003	0.003	0.003	78.742	0.006	0.002

Table B1-236. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2045

Year	Type	Segment	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	BNSF Cajon	14,138,316	0.720	19.949	19.803	0.078	0.303	0.303	0.303	7,698.901	0.623	0.203
2045	Line-Haul Travel	UP Yuma	10,769,427	0.548	15.195	15.085	0.059	0.231	0.231	0.231	5,864.401	0.475	0.154
2045	Line-Haul Travel	UP Mojave	950,244	0.048	1.341	1.331	0.005	0.020	0.020	0.020	517.447	0.042	0.014

Table B1-237. Line-haul Travel Total Annual Emissions (tons/yr) 2045

Year	Type	Region	Annual Work from Locomotives (hp-hr/yr)	Annual Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Within SCAB boundaries	14,644,864	0.745	20.663	20.513	0.081	0.314	0.314	0.314	7,974.738	0.646	0.210
2045	Line-Haul Travel	Between SCAB Boundari	25,857,986	1.316	36.485	36.219	0.142	0.555	0.555	0.555	14,080.750	1.140	0.371

One Hour Peak Emissions (lbs/hr):

Table B1-238. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2045

Year	Type	Subdivision	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Alameda Corridor	310.31	0.03	0.88	0.87	0.00	0.01	0.01	0.01	337.96	0.03	0.01
2045	Line-Haul Travel	East River Bank	23.15	0.00	0.07	0.06	0.00	0.00	0.00	0.00	25.21	0.00	0.00
2045	Line-Haul Travel	BNSF San Bernardino	840.84	0.09	2.37	2.36	0.01	0.04	0.04	0.04	915.74	0.07	0.02
2045	Line-Haul Travel	BNSF Cajon	309.73	0.03	0.87	0.87	0.00	0.01	0.01	0.01	337.33	0.03	0.01
2045	Line-Haul Travel	UP Los Angeles	299.63	0.03	0.85	0.84	0.00	0.01	0.01	0.01	326.32	0.03	0.01
2045	Line-Haul Travel	UP Alhambra	314.27	0.03	0.89	0.88	0.00	0.01	0.01	0.01	342.26	0.03	0.01
2045	Line-Haul Travel	UP Yuma	348.60	0.04	0.98	0.98	0.00	0.01	0.01	0.01	379.65	0.03	0.01
2045	Line-Haul Travel	UP Mojave	24.40	0.00	0.07	0.07	0.00	0.00	0.00	0.00	26.57	0.00	0.00

Table B1-239. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2045

Year	Type	Segment	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	BNSF Cajon	2,385.46	0.24	6.73	6.68	0.03	0.10	0.10	0.10	2,597.96	0.21	0.07
2045	Line-Haul Travel	UP Yuma	1,817.05	0.18	5.13	5.09	0.02	0.08	0.08	0.08	1,978.92	0.16	0.05
2045	Line-Haul Travel	UP Mojave	160.33	0.02	0.45	0.45	0.00	0.01	0.01	0.01	174.61	0.01	0.00

Table B1-240. Line-haul Travel Total Peak Hourly Emissions 2045

Year	Type	Region	1-hr Peak Work (hp-hr/day)	Peak Hourly Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Within SCAB boundaries	2,471	0.251	6.973	6.922	0.027	0.106	0.106	0.106	2,691.040	0.218	0.071
2045	Line-Haul Travel	Between SCAB Boundari	4,363	0.444	12.312	12.222	0.048	0.187	0.187	0.187	4,751.487	0.385	0.125

Eight-Hour Peak Period Emissions (lbs/hr):

Table B1-241. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2045

Year	Type	Subdivision	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Alameda Corridor	2,482.51	0.25	7.01	6.95	0.03	0.11	0.11	0.11	2,703.67	0.22	0.07
2045	Line-Haul Travel	East River Bank	185.20	0.02	0.52	0.52	0.00	0.01	0.01	0.01	201.69	0.02	0.01
2045	Line-Haul Travel	BNSF San Bernardino	6,726.70	0.68	18.98	18.84	0.07	0.29	0.29	0.29	7,325.94	0.59	0.19
2045	Line-Haul Travel	BNSF Cajon	2,477.88	0.25	6.99	6.94	0.03	0.11	0.11	0.11	2,698.61	0.22	0.07
2045	Line-Haul Travel	UP Los Angeles	2,397.01	0.24	6.76	6.71	0.03	0.10	0.10	0.10	2,610.55	0.21	0.07
2045	Line-Haul Travel	UP Alhambra	2,514.12	0.26	7.09	7.04	0.03	0.11	0.11	0.11	2,738.09	0.22	0.07
2045	Line-Haul Travel	UP Yuma	2,788.77	0.28	7.87	7.81	0.03	0.12	0.12	0.12	3,037.21	0.25	0.08
2045	Line-Haul Travel	UP Mojave	195.18	0.02	0.55	0.55	0.00	0.01	0.01	0.01	212.57	0.02	0.01

Table B1-242. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2045

Year	Type	Segment	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	BNSF Cajon	19,083.65	1.94	53.85	53.46	0.21	0.82	0.82	0.82	20,783.68	1.68	0.55
2045	Line-Haul Travel	UP Yuma	14,536.38	1.48	41.02	40.72	0.16	0.62	0.62	0.62	15,831.33	1.28	0.42
2045	Line-Haul Travel	UP Mojave	1,282.62	0.13	3.62	3.59	0.01	0.06	0.06	0.06	1,396.88	0.11	0.04

Table B1-243. Line-haul Travel Total 8-hr Peak Period Emissions 2045

Year	Type	Region	8-hr Peak Hour Work (hp-hr/day)	8-hr Peak Period Emissions (lbs/8hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul Travel	Within SCAB boundaries	19,767	2.012	55.782	55.376	0.218	0.848	0.848	0.848	21,528.321	1.743	0.567
2045	Line-Haul Travel	Between SCAB Boundari	34,903	3.552	98.492	97.775	0.384	1.497	1.497	1.497	38,011.894	3.078	1.000

Analysis Year:	2045

Table B1-244. Line-haul In-yard Peak Daily Emissions (lbs/day) 2045

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Line Haul In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul	WBCT (On-Site)	8,820	0.898	24.888	24.707	0.097	0.378	0.378	0.378	9,605.277	0.778	0.253
2045	Line-Haul	UP ICTF Yard	5,930	0.604	16.734	16.612	0.065	0.254	0.254	0.254	6,458.373	0.523	0.170
2045	Line-Haul	BNSF Hobart & Commerce Yards	6,242	0.635	17.615	17.487	0.069	0.268	0.268	0.268	6,798.288	0.550	0.179
2045	Line-Haul	UP East LA Yard	312	0.032	0.881	0.874	0.003	0.013	0.013	0.013	339.914	0.028	0.009
2045	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**12,484**	1.27	35.23	34.97	0.14	0.54	0.54	0.54	13,596.58	1.10	0.36

Table B1-245. Line-haul In-yard Annual Emissions (tons/yr) 2045

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Line Haul In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul	WBCT (On-Site)	2,178,030	0.111	3.073	3.051	0.012	0.047	0.047	0.047	1,186.028	0.096	0.031
2045	Line-Haul	UP ICTF Yard	1,464,459	0.075	2.066	2.051	0.008	0.031	0.031	0.031	797.459	0.065	0.021
2045	Line-Haul	BNSF Hobart & Commerce Yards	1,541,535	0.078	2.175	2.159	0.008	0.033	0.033	0.033	839.430	0.068	0.022
2045	Line-Haul	UP East LA Yard	77,077	0.004	0.109	0.108	0.000	0.002	0.002	0.002	41.972	0.003	0.001
2045	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**3,083,071**	0.16	4.35	4.32	0.02	0.07	0.07	0.07	1,678.86	0.14	0.04

Peaking Factor:	246.953

Table B1-246. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2045

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Peak Line Haul In-Yard Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul	WBCT (On-Site)	367.48	0.037	1.037	1.029	0.004	0.016	0.016	0.016	400.220	0.032	0.011
2045	Line-Haul	UP ICTF Yard	247.09	0.025	0.697	0.692	0.003	0.011	0.011	0.011	269.099	0.022	0.007
2045	Line-Haul	BNSF Hobart & Commerce Yards	260.09	0.026	0.734	0.729	0.003	0.011	0.011	0.011	283.262	0.023	0.007
2045	Line-Haul	UP East LA Yard	13.00	0.001	0.037	0.036	0.000	0.001	0.001	0.001	14.163	0.001	0.000
2045	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**520**	0.05	1.47	1.46	0.01	0.02	0.02	0.02	566.52	0.05	0.01

Table B1-247. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2045

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Line Haul In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Line-Haul	WBCT (On-Site)	2,939.87	0.299	8.296	8.236	0.032	0.126	0.126	0.126	3,201.759	0.259	0.084
2045	Line-Haul	UP ICTF Yard	1,976.70	0.201	5.578	5.537	0.022	0.085	0.085	0.085	2,152.791	0.174	0.057
2045	Line-Haul	BNSF Hobart & Commerce Yards	2,080.74	0.212	5.872	5.829	0.023	0.089	0.089	0.089	2,266.096	0.183	0.060
2045	Line-Haul	UP East LA Yard	104.04	0.011	0.294	0.291	0.001	0.004	0.004	0.004	113.305	0.009	0.003
2045	Line-Haul	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Line-Haul	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**4,161**	0.42	11.74	11.66	0.05	0.18	0.18	0.18	4,532.19	0.37	0.12

Analysis Year:	2045

Table B1-248. Switchers In-yard Peak Daily Emissions (lbs/day) 2045

Year	Type	Rail Yard	Peak Day Work hp-hrs/day	Peak Daily Switcher In-Yard Emissions (lbs/day)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Switchers	WBCT (On-Site)	632	0.336	2.513	6.138	0.008	0.052	0.052	0.048	933.235	0.070	0.023
2045	Switchers	UP ICTF Yard	406	0.216	1.614	3.943	0.005	0.033	0.033	0.031	599.556	0.045	0.015
2045	Switchers	BNSF Hobart & Commerce Yards	428	0.227	1.699	4.151	0.006	0.035	0.035	0.032	631.112	0.047	0.016
2045	Switchers	UP East LA Yard	21	0.011	0.085	0.208	0.000	0.002	0.002	0.002	31.556	0.002	0.001
2045	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Total Off-dock Railyards	**855**	0.45	3.40	8.30	0.01	0.07	0.07	0.06	1,262.22	0.09	0.03

Table B1-249. Switchers In-yard Annual Emissions (tons/yr) 2045

Year	Type	Rail Yard	Annual Work (hp-hr/yr)	Annual Switcher In-Yard Emissions (tons/yr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Switchers	WBCT (On-Site)	156,169	0.041	0.310	0.758	0.001	0.006	0.006	0.006	115.233	0.009	0.003
2045	Switchers	UP ICTF Yard	100,331	0.027	0.199	0.487	0.001	0.004	0.004	0.004	74.031	0.006	0.002
2045	Switchers	BNSF Hobart & Commerce Yards	105,611	0.028	0.210	0.513	0.001	0.004	0.004	0.004	77.928	0.006	0.002
2045	Switchers	UP East LA Yard	5,281	0.001	0.010	0.026	0.000	0.000	0.000	0.000	3.896	0.000	0.000
2045	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
		Total Off-dock Railyards	**211,223**	0.06	0.42	1.03	0.00	0.01	0.01	0.01	155.86	0.01	0.00

Peaking Factor:	246.953

Table B1-250. Switchers In-yard Peak Hour Emissions (lbs/hr) 2045

Year	Type	Rail Yard	Peak Hour Work hp-hrs	1-hr Switcher In-Yard Peak Emissions (lbs/hr)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Switchers	WBCT (On-Site)	26.35	0.014	0.105	0.256	0.000	0.002	0.002	0.002	38.885	0.003	0.001
2045	Switchers	UP ICTF Yard	16.93	0.009	0.067	0.164	0.000	0.001	0.001	0.001	24.982	0.002	0.001
2045	Switchers	BNSF Hobart & Commerce Yards	17.82	0.009	0.071	0.173	0.000	0.001	0.001	0.001	26.296	0.002	0.001
2045	Switchers	UP East LA Yard	0.89	0.000	0.004	0.009	0.000	0.000	0.000	0.000	1.315	0.000	0.000
2045	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**36**	0.02	0.14	0.35	0.00	0.00	0.00	0.00	52.59	0.00	0.00

Table B1-251. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2045

Year	Type	Rail Yard	Peak 8hr Period hp-hrs	8-hr Peak Switcher In-Yard Emissions (lbs/8-hr period)									
				VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2045	Switchers	WBCT (On-Site)	210.79	0.112	0.838	2.046	0.003	0.017	0.017	0.016	311.078	0.023	0.008
2045	Switchers	UP ICTF Yard	135.42	0.072	0.538	1.314	0.002	0.011	0.011	0.010	199.852	0.015	0.005
2045	Switchers	BNSF Hobart & Commerce Yards	142.55	0.076	0.566	1.384	0.002	0.012	0.012	0.011	210.371	0.016	0.005
2045	Switchers	UP East LA Yard	7.13	0.004	0.028	0.069	0.000	0.001	0.001	0.001	10.519	0.001	0.000
2045	Switchers	UP LATC Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	UP COI Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2045	Switchers	BNSF SCIG Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total Off-dock Railyards			**285**	0.15	1.13	2.77	0.00	0.02	0.02	0.02	420.74	0.03	0.01

Drayage Trucks

Analysis Year	2014

Table B1-252. On-site Truck Activities 2014 - Unmitigated

Parameter	Values
Annual number of two-way trips	554,937
Average Idling Time (min / truck trip)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	1.5

Table B1-253. Port Trucks Age Distribution for Calendar Year Fleet 2014 - Unmitigated

2014: baseline actual data

	Calendar Year
	2014
% Trips by LNG Trucks	8.2%
Model Year	**(%)**
2015	0.0100
2014	0.0203
2013	0.0383
2012	0.0307
2011	0.0854
2010	0.1772
2009	0.3448
2008	0.2822
2007	0.0081
2006	0.0007
2005	0.0003
2004	0.0001
2003	0.0001
2002	0.0000
2001	0.0001
2000	0.0006
1999	0.0001
1998	0.0004
1997	0.0001
1996	0.0002
1995	0.0000
1994	0.0001
1993	0.0000
1992	0.0000
1991	0.0000
1990	0.0000
1989-	0.0000
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-254. Emission Factors 2014 - Unmitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Heavy Duty Trucks	Diesel	15	1.00	1.58	3.51	12.87	2754	0.06	0.05	0.04	0.06	0.01	0.03	0.15	0.09	0.06	0.02	0.06	0.06	2773.75
2014	Heavy Duty Trucks	LNG	15	1.00	1.58	3.51	12.87	2754	0.06	0.05	0.04	0.06	0.01	0.03	0.15	0.09	0.0028	0.02	0.06	0.06	2773.75
				Idling Emission Factors (g/hr)																	
2014	Heavy Duty Trucks	Diesel	idling	1.99	2.26	8.03	52.77	7206	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.07	0.09	0.62	7393.79
2014	Heavy Duty Trucks	LNG	idling	1.99	2.26	8.03	52.77	7206	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.07	0.09	0.62	7393.79

Table B1-255. Annual Running Emissions 2014 - Unmitigated

					Annual Emissions (tons/year)																
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	HDT	Diesel	1.5	509,432	0.84	1.33	2.95	10.84	2319	0.05	0.05	0.03	0.05	0.01	0.02	0.13	0.07	0.05	0.01	0.05	0.05	2336.41
2014	HDT	LNG	1.5	45,505	0.08	0.12	0.26	0.97	207	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	208.70

Table B1-256. Peak Day Running Emissions 2014 - Unmitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	HDT	Diesel	0.00416	7.02	11.04	24.57	90.17	19,288	0.39	0.38	0.25	0.43	0.06	0.18	1.07	0.62	0.39	0.12	0.45	0.44	19429.53
2014	HDT	LNG	0.00416	0.63	0.99	2.19	8.05	1723	0.04	0.03	0.02	0.04	0.01	0.02	0.10	0.06	0.00	0.01	0.04	0.04	1735.54

Table B1-257. Annual Idling Emissions 2014 - Unmitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Heavy Duty Trucks	Diesel	In-Gate	509,432	10	0.19	0.21	0.75	4.94	674	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.006	0.009	0.058	692.00
2014	Heavy Duty Trucks	Diesel	Out-Gate	509,432	6	0.11	0.13	0.45	2.96	405	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.005	0.035	415.20
2014	Heavy Duty Trucks	Diesel	On-terminal	509,432	24	0.45	0.51	1.80	11.85	1619	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.015	0.021	0.140	1660.80
2014	Heavy Duty Trucks	LNG	In-Gate	45,505	10	0.02	0.02	0.07	0.44	60	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.005	61.81
2014	Heavy Duty Trucks	LNG	Out-Gate	45,505	6	0.01	0.01	0.04	0.26	36	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	37.09
2014	Heavy Duty Trucks	LNG	On-terminal	45,505	24	0.04	0.05	0.16	1.06	145	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.013	148.35

Table B1-258. Peak Day Idling 2014 - Unmitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Heavy Duty Trucks	Diesel	In-Gate	2,118	10	1.55	1.76	6.25	41.07	5608	0.008	0.007	0.000	0.000	0.000	0.000	0.008	0.007	0.008	0.054	0.072	0.486	5754.57
2014	Heavy Duty Trucks	Diesel	Out-Gate	2,118	6	0.93	1.06	3.75	24.64	3365	0.005	0.004	0.000	0.000	0.000	0.000	0.005	0.004	0.005	0.032	0.043	0.291	3452.74
2014	Heavy Duty Trucks	Diesel	On-terminal	2,118	24	3.71	4.23	14.99	98.57	13459	0.019	0.018	0.000	0.000	0.000	0.000	0.019	0.018	0.019	0.128	0.172	1.166	13810.96
2014	Heavy Duty Trucks	LNG	In-Gate	189	10	0.14	0.16	0.56	3.67	501	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.006	0.043	514.02
2014	Heavy Duty Trucks	LNG	Out-Gate	189	6	0.08	0.09	0.33	2.20	301	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.004	0.026	308.41
2014	Heavy Duty Trucks	LNG	On-terminal	189	24	0.33	0.38	1.34	8.80	1202	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.011	0.015	0.104	1233.66

Analysis Year	2014

Table B1-259. On-site Truck Activities 2014 - FEIR Mitigated

Parameter	Values
Annual number of two-way trips	554,937
Average Idling Time (min / truck trip)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	1.5

Table B1-260. Port Trucks Age Distribution for Calendar Year Fleet 2014 - FEIR Mitigated

2014: baseline actual ŦſŜŜǘ YƛÈĪ C9Lw YƛǘƛƎI·ǘŜŘ [bD ŦſŜŜǘ̂

	Calendar Year
	2014
% Trips by LNG Trucks (FEIR Mitigated Scenario)	70.0%
Model Year	**(%)**
2015	0.0100
2014	0.0203
2013	0.0383
2012	0.0307
2011	0.0854
2010	0.1772
2009	0.3448
2008	0.2822
2007	0.0081
2006	0.0007
2005	0.0003
2004	0.0001
2003	0.0001
2002	0.0000
2001	0.0001
2000	0.0006
1999	0.0001
1998	0.0004
1997	0.0001
1996	0.0002
1995	0.0000
1994	0.0001
1993	0.0000
1992	0.0000
1991	0.0000
1990	0.0000
1989-	0.0000
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-261. Emission Factors 2014 FEIR Mitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Heavy Duty Trucks	Diesel	15	1.00	1.58	3.51	12.87	2754	0.06	0.05	0.04	0.06	0.01	0.03	0.15	0.09	0.06	0.02	0.06	0.06	2773.75
2014	Heavy Duty Trucks	LNG	15	1.00	1.58	3.51	12.87	2754	0.0560	0.0536	0.04	0.06	0.01	0.03	0.15	0.09	0.0028	0.02	0.06	0.06	2773.75
				Idling Emission Factors (g/hr)																	
2014	Heavy Duty Trucks	Diesel	idling	1.99	2.26	8.03	52.77	7206	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.07	0.09	0.62	7393.79
2014	Heavy Duty Trucks	LNG	idling	1.99	2.26	8.03	52.77	7206	0.0100	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.07	0.09	0.62	7393.79

Table B1-262. Annual Running Emissions 2014 FEIR Mitigated

					Annual Emissions (tons/year)																
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	HDT	Diesel	1.5	166,481	0.28	0.43	0.97	3.54	758	0.02	0.01	0.01	0.02	0.00	0.01	0.04	0.02	0.02	0.00	0.02	0.02	763.53
2014	HDT	LNG	1.5	388,456	0.64	1.01	2.25	8.27	1769	0.04	0.03	0.02	0.04	0.01	0.02	0.10	0.06	0.00	0.01	0.04	0.04	1781.57

Table B1-263. Peak Day Running Emissions 2014 FEIR Mitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	HDT	Diesel	0.00416	2.29	3.61	8.03	29.47	6,303	0.13	0.12	0.08	0.14	0.02	0.06	0.35	0.20	0.13	0.04	0.15	0.14	6349.52
2014	HDT	LNG	0.00416	5.35	8.42	18.73	68.76	14707	0.30	0.29	0.19	0.33	0.05	0.14	0.82	0.47	0.01	0.09	0.34	0.33	14815.54

Table B1-264. Annual Idling Emissions 2014 FEIR Mitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Heavy Duty Trucks	Diesel	In-Gate	166,481	10	0.06	0.07	0.25	1.61	220	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.003	0.019	226.14
2014	Heavy Duty Trucks	Diesel	Out-Gate	166,481	6	0.04	0.04	0.15	0.97	132	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.011	135.69
2014	Heavy Duty Trucks	Diesel	On-terminal	166,481	24	0.15	0.17	0.59	3.87	529	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.005	0.007	0.046	542.74
2014	Heavy Duty Trucks	LNG	In-Gate	388,456	10	0.14	0.16	0.57	3.77	514	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.007	0.045	527.67
2014	Heavy Duty Trucks	LNG	Out-Gate	388,456	6	0.09	0.10	0.34	2.26	309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.004	0.027	316.60
2014	Heavy Duty Trucks	LNG	On-terminal	388,456	24	0.34	0.39	1.37	9.04	1234	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.012	0.016	0.107	1266.40

Table B1-265. Peak Day Idling 2014 FEIR Mitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Heavy Duty Trucks	Diesel	In-Gate	692	10	0.51	0.58	2.04	13.42	1833	0.003	0.002	0.000	0.000	0.000	0.000	0.003	0.002	0.003	0.017	0.023	0.159	1880.58
2014	Heavy Duty Trucks	Diesel	Out-Gate	692	6	0.30	0.35	1.22	8.05	1100	0.002	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.002	0.010	0.014	0.095	1128.35
2014	Heavy Duty Trucks	Diesel	On-terminal	692	24	1.21	1.38	4.90	32.21	4398	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.006	0.042	0.056	0.381	4513.39
2014	Heavy Duty Trucks	LNG	In-Gate	1,615	10	1.18	1.34	4.76	31.32	4276	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.000	0.041	0.055	0.370	4388.01
2014	Heavy Duty Trucks	LNG	Out-Gate	1,615	6	0.71	0.81	2.86	18.79	2566	0.004	0.003	0.000	0.000	0.000	0.000	0.004	0.003	0.000	0.024	0.033	0.222	2632.81
2014	Heavy Duty Trucks	LNG	On-terminal	1,615	24	2.83	3.22	11.43	75.16	10263	0.014	0.014	0.000	0.000	0.000	0.000	0.014	0.014	0.001	0.098	0.132	0.889	10531.23

Analysis Year	2023

Table B1-266. On-site Truck Activities 2023 - Unmitigated

Parameter	Values
Annual number visits	674,190
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-267. Port Trucks Age Distribution for Calendar Year Fleet 2023 - Unmitigated

	Calendar Year
	2023
% Trips by LNG Trucks	8.2%
Model Year	**(%)**
2024	0.0004
2023	0.0019
2022	0.0033
2021	0.0050
2020	0.0066
2019	0.0103
2018	0.0220
2017	0.0441
2016	0.0747
2015	0.1004
2014	0.1196
2013	0.1380
2012	0.1464
2011	0.1598
2010	0.1675
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-268. Emission Factors 2023 Unmitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Heavy Duty Trucks	Diesel	15	0.30	2.50	9.50	7.57	2918	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.10	0.07	2942.20
2023	Heavy Duty Trucks	LNG	15	0.30	2.50	9.50	7.57	2918	0.0088	0.0084	0.04	0.06	0.01	0.03	0.11	0.04	0.0004	0.01	0.10	0.07	2942.20
				Idling Emission Factors (g/hr)																	
2023	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	6041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.02	0.54	6203.26
2023	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	6041	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.06	0.02	0.54	6203.26

Table B1-269. Annual Running Emissions 2023 Unmitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	HDT	Diesel	1.5	618,907	0.31	2.56	9.72	7.74	2986	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.10	0.07	3010.87
2023	HDT	LNG	1.5	55,284	0.03	0.23	0.87	0.69	267	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	268.95

Table B1-270. Peak Day Running Emissions 2023 Unmitigated

			Peak Day Factor		Peak Day Emissions (lb/day)																
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	HDT	Diesel	0.00405	2.51	20.75	78.70	62.71	24,186	0.07	0.07	0.29	0.50	0.07	0.22	0.87	0.36	0.07	0.10	0.85	0.59	24384.14
2023	HDT	LNG	0.00405	0.22	1.85	7.03	5.60	2160	0.01	0.01	0.03	0.04	0.01	0.02	0.08	0.03	0.00	0.01	0.08	0.05	2178.10

Table B1-271. Annual Idling Emissions 2023 Unmitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Heavy Duty Trucks	Diesel	In-Gate	618,907	10	0.06	0.07	0.21	1.76	687	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.062	705.34
2023	Heavy Duty Trucks	Diesel	Out-Gate	618,907	6	0.03	0.04	0.13	1.06	412	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.037	423.20
2023	Heavy Duty Trucks	Diesel	On-terminal	618,907	24	0.14	0.16	0.51	4.23	1649	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.006	0.148	1692.81
2023	Heavy Duty Trucks	LNG	In-Gate	55,284	10	0.01	0.01	0.02	0.16	61	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.006	63.00
2023	Heavy Duty Trucks	LNG	Out-Gate	55,284	6	0.00	0.00	0.01	0.09	37	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	37.80
2023	Heavy Duty Trucks	LNG	On-terminal	55,284	24	0.01	0.01	0.05	0.38	147	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.013	151.21

Table B1-272. Peak Day Idling 2023 Unmitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Heavy Duty Trucks	Diesel	In-Gate	2,506	10	0.47	0.53	1.73	14.28	5563	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.053	0.022	0.499	5712.23
2023	Heavy Duty Trucks	Diesel	Out-Gate	2,506	6	0.28	0.32	1.04	8.57	3338	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.032	0.013	0.300	3427.34
2023	Heavy Duty Trucks	Diesel	On-terminal	2,506	24	1.12	1.28	4.15	34.28	13351	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.127	0.052	1.198	13709.35
2023	Heavy Duty Trucks	LNG	In-Gate	224	10	0.04	0.05	0.15	1.28	497	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.045	510.24
2023	Heavy Duty Trucks	LNG	Out-Gate	224	6	0.03	0.03	0.09	0.77	298	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.027	306.15
2023	Heavy Duty Trucks	LNG	On-terminal	224	24	0.10	0.11	0.37	3.06	1193	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.011	0.005	0.107	1224.58

Analysis Year	2030

Table B1-273. On- site Truck Activities 2030 - Unmitigated

Parameter	Values
Annual number of visits	750,908
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-274. Port TrucksAge Distribution for Calendar Year Fleet 2030 - Unmitigated

	Calendar Year
	2030
% Trips by LNG Trucks	8.2%
Model Year	**(%)**
2031	0.000118685
2030	0.000617944
2029	0.001348074
2028	0.002280696
2027	0.003269243
2026	0.004902176
2025	0.009273635
2024	0.018322149
2023	0.03270033
2022	0.04763331
2021	0.060859596
2020	0.072169307
2019	0.081439662
2018	0.08835619
2017	0.091072318
2016	0.088599925
2015	0.082465223
2014	0.076061823
2013	0.070358348
2012	0.06255039
2011	0.055890733
2010	0.049710242
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-275. Emission Factors 2030 Unmitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Heavy Duty Trucks	Diesel	15	0.34	1.33	5.38	9.70	2420	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.05	0.06	2438.41
2030	Heavy Duty Trucks	LNG	15	0.34	1.33	5.38	9.70	2420	0.0097	0.0092	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.05	0.06	2438.41
				Idling Emission Factors (g/hr)																	
2030	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	5752	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.52	5906.64
2030	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	5752	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.05	0.02	0.52	5906.64

Table B1-276. Annual Running Emissions 2030 Unmitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	HDT	Diesel	1.5	689,334	0.39	1.52	6.13	11.05	2758	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.01	0.02	0.06	0.07	2779.28
2030	HDT	LNG	1.5	61,574	0.04	0.14	0.55	0.99	246	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.01	248.26

Table B1-277. Peak Day Running Emissions 2030 Unmitigated

			Peak Day Factor		Peak Day Emissions (lb/day)																
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	HDT	Diesel	0.00405	3.18	12.27	49.68	89.51	22,336	0.09	0.09	0.33	0.56	0.08	0.24	0.97	0.41	0.09	0.12	0.50	0.54	22508.53
2030	HDT	LNG	0.00405	0.28	1.10	4.44	8.00	1995	0.01	0.01	0.03	0.05	0.01	0.02	0.09	0.04	0.00	0.01	0.04	0.05	2010.57

Table B1-278. Annual Idling Emissions 2030 Unmitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Heavy Duty Trucks	Diesel	In-Gate	689,334	10	0.06	0.07	0.24	1.96	728	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.065	748.04
2030	Heavy Duty Trucks	Diesel	Out-Gate	689,334	6	0.04	0.04	0.14	1.18	437	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.039	448.82
2030	Heavy Duty Trucks	Diesel	On-terminal	689,334	24	0.15	0.18	0.57	4.71	1748	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.007	0.157	1795.29
2030	Heavy Duty Trucks	LNG	In-Gate	61,574	10	0.01	0.01	0.02	0.18	65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.006	66.82
2030	Heavy Duty Trucks	LNG	Out-Gate	61,574	6	0.00	0.00	0.01	0.11	39	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	40.09
2030	Heavy Duty Trucks	LNG	On-terminal	61,574	24	0.01	0.02	0.05	0.42	156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.014	160.36

Table B1-279. Peak Day Idling 2030 Unmitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Heavy Duty Trucks	Diesel	In-Gate	2,791	10	0.52	0.59	1.93	15.91	5900	0.002	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.002	0.056	0.024	0.530	6058.03
2030	Heavy Duty Trucks	Diesel	Out-Gate	2,791	6	0.31	0.36	1.16	9.54	3540	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.034	0.015	0.318	3634.82
2030	Heavy Duty Trucks	Diesel	On-terminal	2,791	24	1.25	1.42	4.63	38.18	14159	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.135	0.058	1.271	14539.26
2030	Heavy Duty Trucks	LNG	In-Gate	249	10	0.05	0.05	0.17	1.42	527	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.047	541.13
2030	Heavy Duty Trucks	LNG	Out-Gate	249	6	0.03	0.03	0.10	0.85	316	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.028	324.68
2030	Heavy Duty Trucks	LNG	On-terminal	249	24	0.11	0.13	0.41	3.41	1265	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.005	0.114	1298.71

Analysis Year	2036

Table B1-280. On-site Truck Activities 2036 - Unmitigated

Parameter	Values
Annual number of visits	756,113
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-281. Port Trucks Age Distribution for Calendar Year Fleet 2036 - Unmitigated

	Calendar Year
	2036
% Trips by LNG Trucks	8.2%
Model Year	**(%)**
2037	0.0001
2036	0.0005
2035	0.0011
2034	0.0019
2033	0.0028
2032	0.0042
2031	0.0080
2030	0.0157
2029	0.0278
2028	0.0408
2027	0.0525
2026	0.0631
2025	0.0719
2024	0.0779
2023	0.0794
2022	0.0757
2021	0.0699
2020	0.0644
2019	0.0591
2018	0.0533
2017	0.0470
2016	0.0410
2015	0.0355
2014	0.0305
2013	0.0254
2012	0.0203
2011	0.0166
2010	0.0137
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-282. Emission Factors 2036 Unmitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Heavy Duty Trucks	Diesel	15	0.35	1.01	4.24	10.15	2251	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.04	0.05	2267.89
2036	Heavy Duty Trucks	LNG	15	0.35	1.01	4.24	10.15	2251	0.0096	0.0092	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.04	0.05	2267.89
				Idling Emission Factors (g/hr)																	
2036	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	5628	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.51	5779.27
2036	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	5628	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.05	0.02	0.51	5779.27

Table B1-283. Annual Running Emissions 2036 Unmitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	HDT	Diesel	1.5	694,112	0.40	1.15	4.87	11.65	2583	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.01	0.02	0.05	0.06	2602.84
2036	HDT	LNG	1.5	62,001	0.04	0.10	0.43	1.04	231	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	232.50

Table B1-284. Peak Day Running Emissions 2036 Unmitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	HDT	Diesel	0.00405	3.24	9.35	39.40	94.36	20,921	0.09	0.09	0.33	0.56	0.08	0.24	0.98	0.41	0.09	0.13	0.38	0.50	21079.62
2036	HDT	LNG	0.00405	0.29	0.84	3.52	8.43	1869	0.01	0.01	0.03	0.05	0.01	0.02	0.09	0.04	0.00	0.01	0.03	0.04	1882.93

Table B1-285. Annual Idling Emissions 2036 Unmitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Heavy Duty Trucks	Diesel	In-Gate	694,112	10	0.06	0.07	0.24	1.98	718	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.064	736.98
2036	Heavy Duty Trucks	Diesel	Out-Gate	694,112	6	0.04	0.04	0.14	1.19	431	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.039	442.19
2036	Heavy Duty Trucks	Diesel	On-terminal	694,112	24	0.16	0.18	0.58	4.75	1722	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.007	0.155	1768.75
2036	Heavy Duty Trucks	LNG	In-Gate	62,001	10	0.01	0.01	0.02	0.18	64	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.006	65.83
2036	Heavy Duty Trucks	LNG	Out-Gate	62,001	6	0.00	0.00	0.01	0.11	38	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	39.50
2036	Heavy Duty Trucks	LNG	On-terminal	62,001	24	0.01	0.02	0.05	0.42	154	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.014	157.99

Table B1-286. Peak Day Idling 2036 Unmitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Heavy Duty Trucks	Diesel	In-Gate	2,811	10	0.53	0.60	1.94	16.02	5812	0.002	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.002	0.055	0.024	0.522	5968.47
2036	Heavy Duty Trucks	Diesel	Out-Gate	2,811	6	0.32	0.36	1.16	9.61	3487	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.033	0.015	0.313	3581.08
2036	Heavy Duty Trucks	Diesel	On-terminal	2,811	24	1.26	1.43	4.66	38.44	13950	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.133	0.059	1.252	14324.33
2036	Heavy Duty Trucks	LNG	In-Gate	251	10	0.05	0.05	0.17	1.43	519	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.047	533.13
2036	Heavy Duty Trucks	LNG	Out-Gate	251	6	0.03	0.03	0.10	0.86	312	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.028	319.88
2036	Heavy Duty Trucks	LNG	On-terminal	251	24	0.11	0.13	0.42	3.43	1246	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.005	0.112	1279.51

Analysis Year	2045

Table B1-287. On-site Truck Activities 2045 - Unmitigated

Parameter	Values
Annual number of visits	757,031
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-288. Port Trucks Age Distribution for Calendar Year Fleet 2045 - Unmitigated

	Calendar Year
	2045
% Trips by LNG Trucks	8.2%
Model Year	**(%)**
2046	0.0001
2045	0.0005
2044	0.0012
2043	0.0020
2042	0.0028
2041	0.0043
2040	0.0080
2039	0.0157
2038	0.0279
2037	0.0410
2036	0.0529
2035	0.0635
2034	0.0719
2033	0.0772
2032	0.0778
2031	0.0736
2030	0.0674
2029	0.0617
2028	0.0563
2027	0.0502
2026	0.0436
2025	0.0373
2024	0.0321
2023	0.0274
2022	0.0226
2021	0.0181
2020	0.0144
2019	0.0115
2018	0.0091
2017	0.0071
2016	0.0056
2015	0.0043
2014	0.0034
2013	0.0027
2012	0.0021
2011	0.0017
2010	0.0014
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-289. Emission Factors 2045 Unmitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Heavy Duty Trucks	Diesel	15	0.35	0.91	3.89	10.27	2188	0.01	0.01	0.04	0.06	0.01	0.03	0.10	0.04	0.01	0.01	0.04	0.05	2204.41
2045	Heavy Duty Trucks	LNG	15	0.35	0.91	3.89	10.27	2188	0.0096	0.0092	0.04	0.06	0.01	0.03	0.10	0.04	0.0005	0.01	0.04	0.05	2204.41
				Idling Emission Factors (g/hr)																	
2045	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	5571	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.50	5720.91
2045	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	5571	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.05	0.02	0.50	5720.91

Table B1-290. Annual Running Emissions 2045 Unmitigated

					Annual Emissions (tons/year)																
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	HDT	Diesel	1.5	694,954	0.40	1.04	4.46	11.80	2514	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.01	0.02	0.04	0.06	2533.05
2045	HDT	LNG	1.5	62,077	0.04	0.09	0.40	1.05	225	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	226.26

Table B1-291. Peak Day Running Emissions 2045 Unmitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	HDT	Diesel	0.00405	3.24	8.43	36.16	95.56	20,362	0.09	0.09	0.33	0.56	0.08	0.24	0.98	0.41	0.09	0.13	0.34	0.48	20514.39
2045	HDT	LNG	0.00405	0.29	0.75	3.23	8.54	1819	0.01	0.01	0.03	0.05	0.01	0.02	0.09	0.04	0.00	0.01	0.03	0.04	1832.44

Table B1-292. Annual Idling Emissions 2045 Unmitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Heavy Duty Trucks	Diesel	In-Gate	694,954	10	0.06	0.07	0.24	1.98	711	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.064	730.42
2045		iesel	Out-Gate	694,954	6	0.04	0.04	0.14	1.19	427	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.038	438.25
2045	Heavy Duty Trucks	Diesel	On-terminal	694,954	24	0.16	0.18	0.58	4.75	1707	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.016	0.007	0.153	1753.01
2045	Heavy Duty Trucks	LNG	In-Gate	62,077	10	0.01	0.01	0.02	0.18	64	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.006	65.24
2045	Heavy Duty Trucks	LNG	Out-Gate	62,077	6	0.00	0.00	0.01	0.11	38	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	39.15
2045	Heavy Duty Trucks	LNG	On-terminal	62,077	24	0.01	0.02	0.05	0.42	152	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.014	156.59

Table B1-293. Peak Day Idling 2045 Unmitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Heavy Duty Trucks	Diesel	In-Gate	2,814	10	0.53	0.60	1.94	16.04	5761	0.002	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.002	0.055	0.024	0.517	5915.37
2045	Heavy Duty Trucks	Diesel	Out-Gate	2,814	6	0.32	0.36	1.17	9.62	3456	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.033	0.015	0.310	3549.22
2045	Heavy Duty Trucks	Diesel	On-terminal	2,814	24	1.26	1.44	4.66	38.48	13826	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.132	0.059	1.241	14196.88
2045	Heavy Duty Trucks	LNG	In-Gate	251	10	0.05	0.05	0.17	1.43	515	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.046	528.39
2045	Heavy Duty Trucks	LNG	Out-Gate	251	6	0.03	0.03	0.10	0.86	309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.001	0.028	317.03
2045	Heavy Duty Trucks	LNG	On-terminal	251	24	0.11	0.13	0.42	3.44	1235	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.012	0.005	0.111	1268.13

Analysis Year	2023

Table B1-294. On-site Truck Activities 2023 - FEIR Mitigated

Parameter	Values
Annual number visits	674,190
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-295. Port Trucks Age Distribution for Calendar Year Fleet 2023 - FEIR Mitigated

	Calendar Year
	2023
% Trips by LNG Trucks (FEIR Mitigated Scenario)	100.0%
Model Year	(%)
2024	0.0004
2023	0.0019
2022	0.0033
2021	0.0050
2020	0.0066
2019	0.0103
2018	0.0220
2017	0.0441
2016	0.0747
2015	0.1004
2014	0.1196
2013	0.1380
2012	0.1464
2011	0.1598
2010	0.1675
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-296. Emission Factors 2023 FEIR Mitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Heavy Duty Trucks	Diesel	15	0.30	2.50	9.50	7.57	2918	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.10	0.07	2942.20
2023	Heavy Duty Trucks	LNG	15	0.30	2.50	9.50	7.57	2918	0.0088	0.0084	0.04	0.06	0.01	0.03	0.11	0.04	0.0004	0.01	0.10	0.07	2942.20
				Idling Emission Factors (g/hr)																	
2023	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	6041	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.02	0.54	6203.26
2023	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	6041	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.06	0.02	0.54	6203.26

Table B1-297. Annual Running Emissions 2023 FEIR Mitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	HDT	Diesel	1.5	0	0.00	0.00	0.00	0.00	0	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
2023	HDT	LNG	1.5	674,190	0.34	2.79	10.59	8.43	3253	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.00	0.01	0.11	0.08	3279.82

Table B1-298. Peak Day Running Emissions 2023 FEIR Mitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	HDT	Diesel	0.00405	0.00	0.00	0.00	0.00	0	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
2023	HDT	LNG	0.00405	2.74	22.60	85.73	68.31	26346	0.08	0.08	0.32	0.55	0.08	0.24	0.95	0.39	0.00	0.11	0.92	0.65	26562.25

Table B1-299. Annual Idling Emissions 2023 FEIR Mitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Heavy Duty Trucks	LNG	In-Gate	674,190	10	0.06	0.07	0.23	1.92	748	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.067	768.34
2023	Heavy Duty Trucks	LNG	Out-Gate	674,190	6	0.04	0.04	0.14	1.15	449	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.040	461.01
2023	Heavy Duty Trucks	LNG	On-terminal	674,190	24	0.15	0.17	0.56	4.61	1796	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.017	0.007	0.161	1844.02

Table B1-300. Peak Day Idling 2023 FEIR Mitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Heavy Duty Trucks	LNG	In-Gate	2,730	10	0.51	0.58	1.89	15.56	6060	0.002	0.001	0.000	0.000	0.000	0.000	0.002	0.001	0.000	0.058	0.024	0.544	6222.47
2023	Heavy Duty Trucks	LNG	Out-Gate	2,730	6	0.31	0.35	1.13	9.33	3636	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.035	0.014	0.326	3733.48
2023	Heavy Duty Trucks	LNG	On-terminal	2,730	24	1.22	1.39	4.53	37.34	14543	0.004	0.003	0.000	0.000	0.000	0.000	0.004	0.003	0.000	0.139	0.057	1.305	14933.93

Analysis Year	2030

Table B1-301. On -site Truck Activities 2030 - FEIR Mitigated

Parameter	Values
Annual number of visits	750,908
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-302. Port Trucks Age Distribution for Calendar Year Fleet 2030 FEIR Mitigated

	Calendar Year
	2030
% Trips by LNG Trucks (FEIR Mitigated Scenario)	100.0%
Model Year	(%)
2031	0.000118685
2030	0.000617944
2029	0.001348074
2028	0.002280696
2027	0.003269243
2026	0.004902176
2025	0.009273635
2024	0.018322149
2023	0.03270033
2022	0.04763331
2021	0.060859596
2020	0.072169307
2019	0.081439662
2018	0.08835619
2017	0.091072318
2016	0.088599925
2015	0.082465223
2014	0.076061823
2013	0.070358348
2012	0.06255039
2011	0.055890733
2010	0.049710242
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-303. Emission Factors 2030 FEIR Mitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Heavy Duty Trucks	Diesel	15	0.34	1.33	5.38	9.70	2420	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.05	0.06	2438.41
2030	Heavy Duty Trucks	LNG	15	0.34	1.33	5.38	9.70	2420	0.0097	0.0092	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.05	0.06	2438.41
				Idling Emission Factors (g/hr)																	
2030	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	5752	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.52	5906.64
2030	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	5752	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.05	0.02	0.52	5906.64

Table B1-304. Annual Running Emissions 2030 FEIR Mitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	HDT	Diesel	1.5	0	0.00	0.00	0.00	0.00	0	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
2030	HDT	LNG	1.5	750,908	0.43	1.65	6.68	12.04	3004	0.01	0.01	0.04	0.08	0.01	0.03	0.13	0.05	0.00	0.02	0.07	0.07	3027.54

Table B1-305. Peak Day Running Emissions 2030 FEIR Mitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	HDT	Diesel	0.00405	0.00	0.00	0.00	0.00	0	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
2030	HDT	LNG	0.00405	3.47	13.37	54.12	97.50	24331	0.10	0.09	0.35	0.61	0.09	0.26	1.06	0.44	0.00	0.13	0.55	0.58	24519.09

Table B1-306. Annual Idling Emissions 2030 FEIR Mitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Heavy Duty Trucks	LNG	In-Gate	750,908	10	0.07	0.08	0.26	2.14	794	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.003	0.071	814.86
2030	Heavy Duty Trucks	LNG	Out-Gate	750,908	6	0.04	0.05	0.16	1.28	476	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.002	0.043	488.91
2030	Heavy Duty Trucks	LNG	On-terminal	750,908	24	0.17	0.19	0.62	5.14	1905	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.008	0.171	1955.65

Table B1-307. Peak Day Idling 2030 FEIR Mitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Heavy Duty Trucks	LNG	In-Gate	3,041	10	0.57	0.65	2.10	17.33	6427	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.061	0.026	0.577	6599.16
2030	Heavy Duty Trucks	LNG	Out-Gate	3,041	6	0.34	0.39	1.26	10.40	3856	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.037	0.016	0.346	3959.49
2030	Heavy Duty Trucks	LNG	On-terminal	3,041	24	1.36	1.55	5.04	41.59	15424	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.147	0.063	1.384	15837.98

Analysis Year	2036

Table B1-308. On-site Truck Activities 2036 - FEIR Mitigated

Parameter	Values
Annual number of visits	756,113
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-309. Port Trucks Age Distribution for Calendar Year Fleet 2036 - FEIR Mitigated

	Calendar Year
	2036
% Trips by LNG Trucks (FEIR Mitigated Scenario)	100.0%
Model Year	**(%)**
2037	0.0001
2036	0.0005
2035	0.0011
2034	0.0019
2033	0.0028
2032	0.0042
2031	0.0080
2030	0.0157
2029	0.0278
2028	0.0408
2027	0.0525
2026	0.0631
2025	0.0719
2024	0.0779
2023	0.0794
2022	0.0757
2021	0.0699
2020	0.0644
2019	0.0591
2018	0.0533
2017	0.0470
2016	0.0410
2015	0.0355
2014	0.0305
2013	0.0254
2012	0.0203
2011	0.0166
2010	0.0137
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-310. Emission Factors 2036 FEIR Mitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Heavy Duty Trucks	Diesel	15	0.35	1.01	4.24	10.15	2251	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.04	0.05	2267.89
2036	Heavy Duty Trucks	LNG	15	0.35	1.01	4.24	10.15	2251	0.0096	0.0092	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.04	0.05	2267.89
				Idling Emission Factors (g/hr)																	
2036	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	5628	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.51	5779.27
2036	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	5628	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.05	0.02	0.51	5779.27

Table B1-311. Annual Running Emissions 2036 FEIR Mitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	HDT	Diesel	1.5	0	0.00	0.00	0.00	0.00	0	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
2036	HDT	LNG	1.5	756,113	0.44	1.26	5.30	12.69	2814	0.01	0.01	0.04	0.08	0.01	0.03	0.13	0.05	0.00	0.02	0.05	0.07	2835.34

Table B1-312. Peak Day Running Emissions 2036 FEIR Mitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	HDT	Diesel	0.00405	0.00	0.00	0.00	0.00	0	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
2036	HDT	LNG	0.00405	3.53	10.18	42.92	102.79	22790	0.10	0.09	0.36	0.61	0.09	0.26	1.06	0.44	0.00	0.14	0.42	0.54	22962.55

Table B1-313. Annual Idling Emissions 2036 FEIR Mitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Heavy Duty Trucks	LNG	In-Gate	756,113	10	0.07	0.08	0.26	2.15	782	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.070	802.81
2036	Heavy Duty Trucks	LNG	Out-Gate	756,113	6	0.04	0.05	0.16	1.29	469	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.042	481.69
2036	Heavy Duty Trucks	LNG	On-terminal	756,113	24	0.17	0.19	0.63	5.17	1876	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.008	0.168	1926.74

Table B1-314. Peak Day Idling 2036 FEIR Mitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Heavy Duty Trucks	LNG	In-Gate	3,062	10	0.57	0.65	2.11	17.45	6332	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.060	0.027	0.568	6501.60
2036	Heavy Duty Trucks	LNG	Out-Gate	3,062	6	0.34	0.39	1.27	10.47	3799	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.036	0.016	0.341	3900.96
2036	Heavy Duty Trucks	LNG	On-terminal	3,062	24	1.37	1.56	5.08	41.88	15196	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.145	0.064	1.364	15603.84

Analysis Year	2045

Table B1-315. On-site Truck Activities 2045 - FEIR Mitigated

Parameter	Values
Annual number of visits	757,031
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	24
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	1.5

Table B1-316. Port Trucks Age Distribution for Calendar Year Fleet 2045 - FEIR Mitigated

	Calendar Year
	2045
% Trips by LNG Trucks (FEIR Mitigated Scenario)	100.0%
Model Year	(%)
2046	0.0001
2045	0.0005
2044	0.0012
2043	0.0020
2042	0.0028
2041	0.0043
2040	0.0080
2039	0.0157
2038	0.0279
2037	0.0410
2036	0.0529
2035	0.0635
2034	0.0719
2033	0.0772
2032	0.0778
2031	0.0736
2030	0.0674
2029	0.0617
2028	0.0563
2027	0.0502
2026	0.0436
2025	0.0373
2024	0.0321
2023	0.0274
2022	0.0226
2021	0.0181
2020	0.0144
2019	0.0115
2018	0.0091
2017	0.0071
2016	0.0056
2015	0.0043
2014	0.0034
2013	0.0027
2012	0.0021
2011	0.0017
2010	0.0014
TOTAL	1.0000

Baseline On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-317. Emission Factors 2045 FEIR Mitigated

				Running Emission Factors (g/mile)																	
Year	Source	Fuel	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Heavy Duty Trucks	Diesel	15	0.35	0.91	3.89	10.27	2188	0.01	0.01	0.04	0.06	0.01	0.03	0.10	0.04	0.01	0.01	0.04	0.05	2204.41
2045	Heavy Duty Trucks	LNG	15	0.35	0.91	3.89	10.27	2188	0.0096	0.0092	0.04	0.06	0.01	0.03	0.10	0.04	0.0005	0.01	0.04	0.05	2204.41
				Idling Emission Factors (g/hr)																	
2045	Heavy Duty Trucks	Diesel	idling	0.51	0.58	1.88	15.51	5571	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.02	0.50	5720.91
2045	Heavy Duty Trucks	LNG	idling	0.51	0.58	1.88	15.51	5571	0.0015	0.0014	0.00	0.00	0.00	0.00	0.00	0.00	0.0001	0.05	0.02	0.50	5720.91

Table B1-318. Annual Running Emissions 2045 FEIR Mitigated

					Annual Emissions (tons/year)																	
Year	Source	Fuel	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	HDT	Diesel	1.5	0	0.00	0.00	0.00	0.00	0	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
2045	HDT	LNG	1.5	757,031	0.44	1.13	4.86	12.85	2739	0.01	0.01	0.04	0.08	0.01	0.03	0.13	0.05	0.00	0.02	0.05	0.07	2759.31

Table B1-319. Peak Day Running Emissions 2045 FEIR Mitigated

			Peak Day Factor	Peak Day Emissions (lb/day)																	
Year	Source	Fuel	(annual to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	HDT	Diesel	0.00405	0.00	0.00	0.00	0.00	0	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
2045	HDT	LNG	0.00405	3.53	9.19	39.39	104.09	22180	0.10	0.09	0.36	0.61	0.09	0.26	1.06	0.44	0.00	0.14	0.37	0.53	22346.83

Table B1-320. Annual Idling Emissions 2045 FEIR Mitigated

			Activity			Annual Emissions (tons/year)																
Year	Source	Fuel	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Heavy Duty Trucks	LNG	In-Gate	757,031	10	0.07	0.08	0.26	2.16	775	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.003	0.070	795.67
2045	Heavy Duty Trucks	LNG	Out-Gate	757,031	6	0.04	0.05	0.16	1.29	465	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.002	0.042	477.40
2045	Heavy Duty Trucks	LNG	On-terminal	757,031	24	0.17	0.19	0.63	5.18	1860	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.008	0.167	1909.60

Table B1-321. Peak Day Idling 2045 FEIR Mitigated

			Activity			Peak Day Emissions (lb/day)																
Year	Source	Fuel	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Heavy Duty Trucks	Diesel	In-Gate	0	10	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Heavy Duty Trucks	Diesel	Out-Gate	0	6	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Heavy Duty Trucks	Diesel	On-terminal	0	24	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Heavy Duty Trucks	LNG	In-Gate	3,065	10	0.57	0.65	2.12	17.47	6275	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.060	0.027	0.563	6443.76
2045	Heavy Duty Trucks	LNG	Out-Gate	3,065	6	0.34	0.39	1.27	10.48	3765	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.036	0.016	0.338	3866.25
2045	Heavy Duty Trucks	LNG	On-terminal	3,065	24	1.37	1.56	5.08	41.92	15061	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.144	0.064	1.352	15465.02

Table B1-322. On-road Fugitive Dust Parameters and Emission Factors - all years

Roadtype	sL (g/m2) [1]	Vehicle Weight (tons)	Vehicle Weight Reference	PM10 Multiplier (g/vmt) [1]	PM2.5 Multiplier (g/vmt) [1]	PM10 EF (g/mile) [1]	PM2.5 EF (g/mile) [1]
Freeways	0.0200	2.4	[1]	1	0.15	0.069	0.010
Major	0.0130	2.4	[1]	1	0.15	0.047	0.007
Collector	0.0130	2.4	[1]	1	0.15	0.047	0.007
Local	0.1350	2.4	[1]	1	0.15	0.395	0.059
Onsite	0.1350	18.9	[2]	1	0.15	3.240	0.486

Sources:

[1] http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2014.pdf

[2] From John C.: Based on Trinity Report Table 19-1

$$E = k\ (sL)^{0.91} \times (W)^{1.02} \qquad (1)$$

where: E = particulate emission factor (having units matching the units of k),
k = particle size multiplier for particle size range and units of interest (see below),
sL = road surface silt loading (grams per square meter) (g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

Baseline On-terminal Truck Road Dust Emissions

Table B1-323. Annual Road Dust Emissions 2014 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2014	HDT	832,405	2.97	0.45	3.24	0.49

Table B1-324. Peak Day Road Dust Emissions 2014 Unmit.

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2014	HDT	0.00416	24.73	3.71

Table B1-325. 8 hr Road Dust Emissions 2014 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr	PM10	PM2.5
2014	HDT	0.48962	12.11	1.82

Table B1-326. 1 hr Road Dust Emissions 2014 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2014	HDT	0.07041	1.74	0.26

Table B1-327. Road Dust Emissions BrokenDown by FuelType 2014 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2014	HDT	Diesel	Annual	2.73	0.41	tons/year
2014	HDT	LNG	Annual	0.24	0.04	tons/year
2014	HDT	Diesel	Day	22.70	3.41	lbs/day
2014	HDT	LNG	Day	2.03	0.30	lbs/day
2014	HDT	Diesel	8 hr	11.11	1.67	lbs/8hr
2014	HDT	LNG	8 hr	0.99	0.15	lbs/8hr
2014	HDT	Diesel	1 hr	1.60	0.24	lbs/hr
2014	HDT	LNG	1hr	0.14	0.02	lbs/hr

Future Year On-terminal Truck Road Dust Emissions

Table B1-328. Annual Road Dust Emissions 2023 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2023	HDT	1,011,285	3.61	0.54	3.24	0.49

Table B1-329. Peak Day Road Dust Emissions 2023 Unmit.

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2023	HDT	0.00405	29.25	4.39

Table B1-330. 8 hr Road Dust Emissions 2023 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2023	HDT	0.52972	15.50	2.33

Table B1-331. 1 hr Road Dust Emissions 2023 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2023	HDT	0.07369	2.16	0.32

Table B1-332. Road Dust Emissions Broken Down by Fuel Type 2023 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2023	HDT	Diesel	Annual	3.32	0.50	tons/year
2023	HDT	LNG	Annual	0.30	0.04	tons/year
2023	HDT	Diesel	Day	26.86	4.03	lbs/day
2023	HDT	LNG	Day	2.40	0.36	lbs/day
2023	HDT	Diesel	8 hr	14.23	2.13	lbs/8hr
2023	HDT	LNG	8 hr	1.27	0.19	lbs/8hr
2023	HDT	Diesel	1 hr	1.98	0.30	lbs/hr
2023	HDT	LNG	1hr	0.18	0.03	lbs/hr

Future Year On-terminal Truck Road Dust Emissions

Table B1-333. Annual Road Dust Emissions 2030 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2030	HDT	1,126,363	4.02	0.60	3.24	0.49

Table B1-334. Peak Day Road Dust Emissions 2030 Unmiti.

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2030	HDT	0.00405	32.58	4.89

Table B1-335. 8 hr Road Dust Emissions 2030 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr	PM10	PM2.5
2030	HDT	0.52972	17.26	2.59

Table B1-336. 1 hr Road Dust Emissions 2030 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2030	HDT	0.07369	2.40	0.36

Table B1-337. Road Dust Emissions broken down by Fuel Type 2030 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2030	HDT	Diesel	Annual	3.69	0.55	tons/year
2030	HDT	LNG	Annual	0.33	0.05	tons/year
2030	HDT	Diesel	Day	29.91	4.49	lbs/day
2030	HDT	LNG	Day	2.67	0.40	lbs/day
2030	HDT	Diesel	8 hr	15.84	2.38	lbs/8hr
2030	HDT	LNG	8 hr	1.42	0.21	lbs/8hr
2030	HDT	Diesel	1 hr	2.20	0.33	lbs/hr
2030	HDT	LNG	1hr	0.20	0.03	lbs/hr

Future Year On-terminal Truck Road Dust Emissions

Table B1-338. Annual Road Dust Emissions 2036 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2036	HDT	1,134,170	4.05	0.61	3.24	0.49

Table B1-339. Peak Day Road Dust Emissions 2036 Unmiti.

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2036	HDT	0.00405	32.81	4.92

Table B1-340. 8 h Roar Dust Emissions 2036 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr	PM10	PM2.5
2036	HDT	0.52972	17.38	2.61

Table B1-341. 1 hr Road Dust Emissions 2036 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2036	HDT	0.07369	2.42	0.36

Table B1-342. Road Dust Emissions Broken Down by Fuel Type 2036 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2036	HDT	Diesel	Annual	3.72	0.56	tons/year
2036	HDT	LNG	Annual	0.33	0.05	tons/year
2036	HDT	Diesel	Day	30.12	4.52	lbs/day
2036	HDT	LNG	Day	2.69	0.40	lbs/day
2036	HDT	Diesel	8 hr	15.95	2.39	lbs/8hr
2036	HDT	LNG	8 hr	1.43	0.21	lbs/8hr
2036	HDT	Diesel	1 hr	2.22	0.33	lbs/hr
2036	HDT	LNG	1hr	0.20	0.03	lbs/hr

Future Year On-terminal Truck Road Dust Emissions

Table B1-343. Annual Road Dust Emissions 2045 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2045	HDT	1,135,546	4.06	0.61	3.24	0.49

Table B1-344. Peak Day Road Dust Emissions 2045 Unmit.

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2045	HDT	0.00405	32.85	4.93

Table B1-345. 8 hr Road Dust Emissions 2045 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr	PM10	PM2.5
2045	HDT	0.52972	17.40	2.61

Table B1-346. 1 hr Road Dust Emissions 2045 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2045	HDT	0.07369	2.42	0.36

Table B1-347. Road Dust Emissions Broken Down by Fuel Type 2045 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2045	HDT	Diesel	Annual	3.72	0.56	tons/year
2045	HDT	LNG	Annual	0.33	0.05	tons/year
2045	HDT	Diesel	Day	30.16	4.52	lbs/day
2045	HDT	LNG	Day	2.69	0.40	lbs/day
2045	HDT	Diesel	8 hr	15.97	2.40	lbs/8hr
2045	HDT	LNG	8 hr	1.43	0.21	lbs/8hr
2045	HDT	Diesel	1 hr	2.22	0.33	lbs/hr
2045	HDT	LNG	1hr	0.20	0.03	lbs/hr

Worker Vehicles

Analysis Year	2014

Table B1-348. On-site Passenger Car Activities 2014 - Unmitigated

Parameter	Values
Annual number of one-way trips*	113,276
Average Idling Time (min / truck trip)	
At in-gate	0
At out-gate	0
On-terminal, not including at gate	0
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	0.6

Baseline On-terminal Truck Emissions

Table B1-349. Emission Factors 2014 Unmitigated

			Running Emission Factors (g/mile)																	
Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Passenger Cars	15	0.10	0.14	2.11	0.17	600.99	0.01	0.01	0.01	0.04	0.002	0.02	0.05	0.02	0.00	0.01	0.03	0.0069	603.82
			Idling Emission Factors (g/hr)																	
2014	Passenger Cars	idling	1.08	1.47	13.73	1.04	5262.49	0.07	0.06	0.00	0.00	0.000	0.00	0.07	0.06	0.00	0.05	0.34	0.0439	5283.98

Table B1-350. Annual Running Emissions 2014 Unmitigated

				Annual Emissions (tons/year)																	
Year	Source	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	PC	0.6	113,276	0.01	0.01	0.16	0.01	45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	45.24

Table B1-351. Peak Day Running Emissions 2014 Unmit.

		Peak Day	Peak Day Emissions (lb/day)																	
Year	Source	Factor (annual	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	PC	0.00416	0.06	0.09	1.31	0.10	374	0.00	0.00	0.00	0.02	0.00	0.01	0.03	0.01	0.00	0.00	0.02	0.00	376.19

Table B1-352. Annual Idling Emissions 2014 Unmitigated

		Activity			Annual Emissions (tons/year)																
Year	Source	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Passenger Cars	In-Gate	113,276	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2014	Passenger Cars	Out-Gate	113,276	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2014	Passenger Cars	On-terminal	113,276	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Table B1-353. Peak Day Idling 2014 Unmitigated

		Activity			Peak Day Emissions (lb/day)																
Year	Source	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2014	Passsenger Cars	In-Gate	471	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2014	Passsenger Cars	Out-Gate	471	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2014	Passsenger Cars	On-terminal	471	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Analysis Year	2023

Table B1-354. On-site Passenger Car Activities 2023 Unmitigated

Parameter	Values
Annual number of one-way trips*	287,091
Average Idling Time (min / PC trip)	
At in-gate	0
At out-gate	0
On-terminal, not including at gate	0
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	0.6

Baseline On-terminal PC Emissions

Table B1-355. Emission Factors 2023 Unmitigated

			Running Emission Factors (g/mile)																
Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Passenger Cars	15	0.03	0.04	0.85	0.06	445.55	0.00	0.00	0.01	0.04	0.002	0.02	0.05	0.02	0.00	0.00	0.01	0.0028	446.66
			Idling Emission Factors (g/hr)																	
2023	Passenger Cars	idling	0.32	0.46	5.17	0.40	3879.47	0.06	0.05	0.00	0.00	0.000	0.00	0.06	0.05	0.00	0.04	0.12	0.0184	3888.06

Table B1-356. Annual Running Emissions 2023 Unmitigated

				Annual Emissions (tons/year)																
Year	Source	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	PC	0.6	287,091	0.01	0.01	0.16	0.01	85	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	84.81

Table B1-357. Peak Day Running Emissions 2023 Unmitig.

		Peak Day Factor (annual	Peak Day Emissions (lb/day)																	
Year	Source	to peak)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	PC	0.00405	0.04	0.06	1.30	0.09	685	0.01	0.01	0.01	0.06	0.00	0.02	0.08	0.03	0.00	0.01	0.02	0.00	686.86

Table B1-358. Annual Idling Emissions 2023 Unmitigated

		Activity			Annual Emissions (tons/year)																
Year	Source	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Passenger Cars	In-Gate	287,091	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Passenger Cars	Out-Gate	287,091	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Passenger Cars	On-terminal	287,091	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Table B1-359. Peak Day Idling 2023 Unmitigated

		Activity			Peak Day Emissions (lb/day)																
Year	Source	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2023	Passsenger Cars	In-Gate	1,163	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Passsenger Cars	Out-Gate	1,163	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2023	Passsenger Cars	On-terminal	1,163	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

China Shipping Operations Data Needs	Analysis Year	2030

Table B1-360. On-site Passenger Car Activities 2030 Unmitigated

Parameter	Values
Annual number of one-way trips*	315,800
Average Idling Time (min / PC trip)	
At in-gate	0
At out-gate	0
On-terminal, not including at gate	0
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	0.6

Baseline On-terminal PC Emissions

Table B1-361. Emission Factors 2030 Unmitigated

			Running Emission Factors (g/mile)																
Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Passenger Cars	15	0.02	0.02	0.56	0.04	347.12	0.00	0.00	0.01	0.04	0.002	0.02	0.05	0.02	0.00	0.00	0.01	0.0019	347.83
			Idling Emission Factors (g/hr)																	
2030	Passenger Cars	idling	0.18	0.26	3.43	0.24	3022.87	0.04	0.04	0.00	0.00	0.000	0.00	0.04	0.04	0.00	0.03	0.07	0.0122	3028.31

Table B1-362. Annual Running Emissions 2030 Unmitigated

				Annual Emissions (tons/year)																
Year	Source	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	PC	0.6	315,800	0.00	0.00	0.12	0.01	73	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	72.65

Table B1-363. Peak Day Running Emissions 2030 Unmitigated

			Peak Day	Peak Day Emissions (lb/day)																
Year	Source		Factor (annual	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	PC		0.00405	0.03	0.04	0.95	0.06	587	0.01	0.01	0.01	0.06	0.00	0.03	0.08	0.04	0.00	0.01	0.01	0.00	588.37

Table B1-364. Annual Idling Emissions 2030 Unmitigated

		Activity			Annual Emissions (tons/year)																
Year	Source	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Passenger Cars	In-Gate	315,800	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Passenger Cars	Out-Gate	315,800	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Passenger Cars	On-terminal	315,800	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Table B1-365. Peak Day Idling 2030 Unmitigated

		Activity			Peak Day Emissions (lb/day)																
Year	Source	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Passsenger Cars	In-Gate	1,279	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Passsenger Cars	Out-Gate	1,279	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2030	Passsenger Cars	On-terminal	1,279	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Analysis Year	2036

Table B1-366. On-site Passenger Car Activities 2036 Unmitigated

Parameter	Values
Annual number of one-way trips*	313,484
Average Idling Time (min / PC trip)	
At in-gate	0
At out-gate	0
On-terminal, not including at gate	0
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	0.6

Baseline On-terminal PC Emissions

Table B1-367. Emission Factors 2036 Unmitigated

			Running Emission Factors (g/mile)																
Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Passenger Cars	15	0.01	0.02	0.44	0.03	312.58	0.00	0.00	0.01	0.04	0.002	0.02	0.05	0.02	0.00	0.00	0.00	0.0015	313.12
			Idling Emission Factors (g/hr)																	
2036	Passenger Cars	idling	0.13	0.19	2.69	0.18	2726.91	0.03	0.02	0.00	0.00	0.000	0.00	0.03	0.02	0.00	0.03	0.05	0.0096	2731.03

Table B1-368. Annual Running Emissions 2036 Unmitigated

				Annual Emissions (tons/year)																
Year	Source	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	PC	0.6	313,484	0.00	0.00	0.09	0.01	65	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	64.92

Table B1-369. Peak Day Running Emissions 2036 Unmitigated

			Peak Day	Peak Day Emissions (lb/day)																
Year	Source	Peak Day Factor (annual		VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	PC	0.00405		0.02	0.03	0.73	0.05	525	0.00	0.00	0.01	0.06	0.00	0.03	0.08	0.03	0.00	0.01	0.01	0.00	525.78

Table B1-370. Annual Idling Emissions 2036 Unmitigated

		Activity			Annual Emissions (tons/year)																
Year	Source	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Passenger Cars	In-Gate	313,484	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Passenger Cars	Out-Gate	313,484	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Passenger Cars	On-terminal	313,484	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Table B1-371. Peak Day Idling 2036 Unmitigated

		Activity			Peak Day Emissions (lb/day)																
Year	Source	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2036	Passsenger Cars	In-Gate	1,269	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Passsenger Cars	Out-Gate	1,269	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2036	Passsenger Cars	On-terminal	1,269	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

China Shipping Operations Data Needs	Analysis Year	2045

Table B1-372. On-site Passenger Car Activities 2045 Unmitigated

Parameter	Values
Annual number of one-way trips*	319,041
Average Idling Time (min / PC trip)	
At in-gate	0
At out-gate	0
On-terminal, not including at gate	0
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/trip)	0.6

Baseline On-terminal PC Emissions

Table B1-373. Emission Factors 2045 Unmitigated

			Running Emission Factors (g/mile)																
Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10break	PM2.5tire	PM2.5break	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Passenger Cars	15	0.01	0.01	0.37	0.02	298.71	0.00	0.00	0.01	0.04	0.002	0.02	0.05	0.02	0.00	0.00	0.00	0.0013	299.19
			Idling Emission Factors (g/hr)																	
2045	Passenger Cars	idling	0.11	0.15	2.33	0.16	2608.94	0.02	0.02	0.00	0.00	0.000	0.00	0.02	0.02	0.00	0.03	0.04	0.0086	2612.53

Table B1-374. Annual Running Emissions 2045 Unmitigated

				Annual Emissions (tons/year)																
Year	Source	On-terminal distance (miles/visit)	No. of visits per year	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	PC	0.6	319,041	0.00	0.00	0.08	0.00	63	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	63.13

Table B1-375. Peak Day Running Emissions 2045 Unmit.

		Peak Day	Peak Day Emissions (lb/day)																	
Year	Source	Factor (annual	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	PC	0.00405	0.02	0.02	0.64	0.04	510	0.00	0.00	0.01	0.06	0.00	0.03	0.08	0.03	0.00	0.01	0.01	0.00	511.28

Table B1-376. Annual Idling Emissions 2045 Unmitigated

		Activity			Annual Emissions (tons/year)																
Year	Source	Location	No. of visits per year	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Passenger Cars	In-Gate	319,041	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Passenger Cars	Out-Gate	319,041	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Passenger Cars	On-terminal	319,041	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Table B1-377. Peak Day Idling 2045 Unmitigated

		Activity			Peak Day Emissions (lb/day)																
Year	Source	Location	Peak day visits	Idling time (min/visit)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10TW	PM10BW	PM2.5TW	PM2.5BW	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2045	Passsenger Cars	In-Gate	1,292	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Passsenger Cars	Out-Gate	1,292	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00
2045	Passsenger Cars	On-terminal	1,292	0	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.00

Table B1-378. Fugitive Dust Parameters and Emission Factors

Roadtype	sL (g/m2) [1]	Vehicle Weight (tons)	Vehicle Weight Reference	PM10 Multiplier (g/vmt) [1]	PM2.5 Multiplier (g/vmt) [1]	PM10 EF (g/mile) [1]	PM2.5 EF (g/mile) [1]
Freeways	0.0200	2.4	[1]	1	0.15	0.069	0.010
Major	0.0130	2.4	[1]	1	0.15	0.047	0.007
Collector	0.0130	2.4	[1]	1	0.15	0.047	0.007
Local	0.1350	2.4	[1]	1	0.15	0.395	0.059
Onsite	0.1350	2.4	[2]	1	0.15	0.395	0.059

Sources:

[1] http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-9_2014.pdf

[2] From John C.: Based on Trinity Report Table 19-1

$$E = k\ (sL)^{0.91} \times (W)^{1.02} \qquad (1)$$

where: E = particulate emission factor (having units matching the units of k),
k = particle size multiplier for particle size range and units of interest (see below),
sL = road surface silt loading (grams per square meter) (g/m^2), and
W = average weight (tons) of the vehicles traveling the road.

Baseline On-terminal PC Fugitive Dust Emissions

Table B1-379. Annual Emissions 2014 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2014	PC	67,965	0.03	0.00	0.39	0.06

Table B1-380. Peak Day Emissions 2014 Unmitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2014	PC	0.00416	0.25	0.04

Table B1-381. 8 hr Emissions 2014 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2014	PC	0.48962	0.12	0.02

Table B1-382. 1 hr Emissions 2014 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2014	PC	0.07369	0.02	0.00

Table B1-383. Emissions Broken Down by Fuel Type 2014 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2014	PC	Aggregate	Annual	0.03	0.00	tons/year
2014	PC	Aggregate	Day	0.25	0.04	lbs/day
2014	PC	Aggregate	8 hr	0.12	0.02	lbs/8hr
2014	PC	Aggregate	1 hr	0.02	0.00	lbs/hr

Future Year On-terminal PC Fugitive Dust Emissions

Table B1-384. Annual Emissions 2023 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2023	PC	172,254	0.07	0.01	0.39	0.06

Table B1-385. Peak Day Emissions 2023 Unmitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2023	PC	0.00405	0.61	0.09

Table B1-386. 8 hr Emissions 2023 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2023	PC	0.52972	0.32	0.05

Table B1-387. 1 hr Emissions 2023 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2023	PC	0.07369	0.04	0.01

Table B1-388. Emissions Broken Down by Fuel Type 2023 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2023	PC	Aggregate	Annual	0.07	0.01	tons/year
2023	PC	Aggregate	Day	0.61	0.09	lbs/day
2023	PC	Aggregate	8 hr	0.32	0.05	lbs/8hr
2023	PC	Aggregate	1 hr	0.04	0.01	lbs/hr

Future Year On-terminal PC Fugitive Dust Emissions

Table B1-389. Annual Emissions 2030 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2030	PC	189,480	0.08	0.01	0.39	0.06

Table B1-390. Peak Day Emissions 2030 Unmitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2030	PC	0.00405	0.67	0.10

Table B1-391. 8 hr Emissions 2030 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr	PM10	PM2.5
2030	PC	0.52972	0.35	0.05

Table B1-392. 1 hr Emissions 2030 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2030	PC	0.07369	0.05	0.01

Table B1-393. Emissions Broken Down by Fuel Type 2030 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2030	PC	Aggregate	Annual	0.08	0.01	tons/year
2030	PC	Aggregate	Day	0.67	0.10	lbs/day
2030	PC	Aggregate	8 hr	0.35	0.05	lbs/8hr
2030	PC	Aggregate	1 hr	0.05	0.01	lbs/hr

Future Year On-terminal PC Fugitive Dust Emissions

Table B1-394. Annual Emissions 2036 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2036	PC	188,091	0.08	0.01	0.39	0.06

Table B1-395. Peak Day Emissions 2036 Unmitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2036	PC	0.00405	0.66	0.10

Table B1-396. 8 hr Emissions 2036 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2036	PC	0.52972	0.35	0.05

Table B1-397. 1 hr Emissions 2036 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2036	PC	0.07369	0.05	0.01

Table B1-398. Emissions Broken Down by Fuel Type 2036 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2036	PC	Aggregate	Annual	0.08	0.01	tons/year
2036	PC	Aggregate	Day	0.66	0.10	lbs/day
2036	PC	Aggregate	8 hr	0.35	0.05	lbs/8hr
2036	PC	Aggregate	1 hr	0.05	0.01	lbs/hr

Future Year On-terminal PC Fugitive Dust Emissions

Table B1-399. Annual Emissions 2045 Unmitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2045	PC	191,425	0.08	0.01	0.39	0.06

Table B1-400. Peak Day Emissions 2045 Unmitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2045	PC	0.00405	0.67	0.10

Table B1-401. 8 hr Emissions 2045 Unmitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2045	PC	0.52972	0.36	0.05

Table B1-402. 1 hr Emissions 2045 Unmitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2045	PC	0.07369	0.05	0.01

Table B1-403. Emissions Broken Down by Fuel Type 2045 Unmitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2045	PC	Aggregate	Annual	0.08	0.01	tons/year
2045	PC	Aggregate	Day	0.67	0.10	lbs/day
2045	PC	Aggregate	8 hr	0.36	0.05	lbs/8hr
2045	PC	Aggregate	1 hr	0.05	0.01	lbs/hr

Harbor Craft/Tugs

Analysis Year	2014

26-Jan-16

Table B1-404. Tug Characteristics 2014

Tug	MY	# of Engines	HP per Engine	Load Factor
Average Tug Main	2003	2	1908	0.31
Average Tug Auxiliary	2007	2	182	0.43

Table B1-405. Tug Engine Composite Emission Factors 2014

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.26	0.24	0.26	7.02	0.01	3.74	0.60	486.19	0.02	0.01
Auxiliary	0.16	0.14	0.16	4.95	0.01	3.92	0.64	486.19	0.02	0.01

Table B1-406. Maneuvering Time Duration 2014

Transit zone	Hrs
Within breakwater	0.5
Precautionary zone	0.0
Shift (anchorage to berth)	0.3

Table B1-407. Annual Activity for Tugs 2014

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2014			
Containerships 10,000 - 11,000 TEU	63	2	0.6
Containerships 9,000 - 10,000 TEU	14	2	0.6
Containerships 8,000 - 9,000 TEU	67	2	0.6
Containerships 6,000 - 7,000 TEU	17	2	0.6
Containerships 5,000 - 6,000 TEU	-	2	0.6
Containerships 4,000 - 5,000 TEU	2	2	0.6
Containerships 3,000 - 4,000 TEU	-	2	0.6
Containerships 2,000 - 3,000 TEU	-	2	0.6
Containerships 1,000 - 2,000 TEU	-	2	0.6
General Cargo Vessels	-	2	0.6
Total	163		

Table B1-408. Peak Day Activity for Tugs 2014

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2014			
Containerships 10,000 - 11,000 TEU	2	2	0.6
Containerships 9,000 - 10,000 TEU	-	2	0.6
Containerships 8,000 - 9,000 TEU	-	2	0.6
Containerships 6,000 - 7,000 TEU	-	2	0.6
Containerships 5,000 - 6,000 TEU	-	2	0.6
Containerships 4,000 - 5,000 TEU	-	2	0.6
Containerships 3,000 - 4,000 TEU	-	2	0.6
Containerships 2,000 - 3,000 TEU	-	2	0.6
Containerships 1,000 - 2,000 TEU	-	2	0.6
General Cargo Vessels	-	2	0.6
Total	2		

Table B1-409. Annual Activity for Anchorage Shifts 2014

Project Scenario/Ship Type	*Transits**	*No. of tugs per call*	*Average assist duration (hr)***
Project Year 2014			
Containerships 10,000 - 11,000 TEU	7	2	0.3
Containerships 9,000 - 10,000 TEU	2	2	0.3
Containerships 8,000 - 9,000 TEU	6	2	0.3
Containerships 6,000 - 7,000 TEU	-	2	0.3
Containerships 5,000 - 6,000 TEU	-	2	0.3
Containerships 4,000 - 5,000 TEU	-	2	0.3
Containerships 3,000 - 4,000 TEU	-	2	0.3
Containerships 2,000 - 3,000 TEU	-	2	0.3
Containerships 1,000 - 2,000 TEU	-	2	0.3
General Cargo Vessels	-	2	0.3
Total	15		

*Note: it is assumed tugs' anchorage transits are from anchorage location to berth

**Shift duration is derived from the time it takes tugged vessels to travel 2 nm from anchorage location to breakwater entrace at 7.5 knots

Table B1-410. Peak Day Activity for Anchorage Shifts 2014

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2014			
Containerships 10,000 - 11,000 TEU	-	2	0.3
Containerships 9,000 - 10,000 TEU	-	2	0.3
Containerships 8,000 - 9,000 TEU	-	2	0.3
Containerships 6,000 - 7,000 TEU	-	2	0.3
Containerships 5,000 - 6,000 TEU	-	2	0.3
Containerships 4,000 - 5,000 TEU	-	2	0.3
Containerships 3,000 - 4,000 TEU	-	2	0.3
Containerships 2,000 - 3,000 TEU	-	2	0.3
Containerships 1,000 - 2,000 TEU	-	2	0.3
General Cargo Vessels	-	2	0.3
Total	-		

Note: no anchorage shift movements happens during peak day period evaluated

Table B1-411. Peak 1hr Period Tug Activity 2014

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2014			
Containerships 10,000 - 11,000 TEU	2.00	-	0.47
Containerships 9,000 - 10,000 TEU	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	2		

Table B1-412. Peak 8hr Period Tug Activity 2014

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2014			
Containerships 10,000 - 11,000 TEU	2.00	-	0.47
Containerships 9,000 - 10,000 TEU	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	2		

Table B1-413. Annual Emissions from Tugboat Main Engine - 2014

	Tons Per Year							GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.03	0.03	0.03	0.73	0.00	0.39	0.06	50.87	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.01	0.01	0.01	0.17	0.00	0.09	0.01	11.46	0.00	0.00
Containerships 8,000 - 9,000 TEU	0.03	0.03	0.03	0.77	0.00	0.41	0.07	53.60	0.00	0.00
Containerships 6,000 - 7,000 TEU	0.01	0.01	0.01	0.19	0.00	0.10	0.02	13.08	0.00	0.00
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	0.00	0.00	0.00	0.02	0.00	0.01	0.00	1.54	0.00	0.00
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.07	0.07	0.07	1.88	0.00	1.00	0.16	130.54	0.01	0.00

Table B1-414. Annual Emissions from Tugboat Auxiliary Engines - 2014

	Tons Per Year							GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.00	0.00	0.00	0.07	0.00	0.05	0.01	6.73	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.00	0.00	0.00	0.02	0.00	0.01	0.00	1.52	0.00	0.00
Containerships 8,000 - 9,000 TEU	0.00	0.00	0.00	0.07	0.00	0.06	0.01	7.09	0.00	0.00
Containerships 6,000 - 7,000 TEU	0.00	0.00	0.00	0.02	0.00	0.01	0.00	1.73	0.00	0.00
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.01	0.01	0.01	0.18	0.00	0.14	0.02	17.27	0.00	0.00

Table B1-415. Peak Day Emissions from Tugboat Main Engine - 2014

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.001	0.001	0.001	0.022	0.000	0.012	0.002	1.538	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.001	0.001	0.001	0.022	0.000	0.012	0.002	1.538	0.000	0.000

Table B1-416. Peak Day Emissions from Tugboat Auxiliary Engines - 2014

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.204	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.002	0.000	0.204	0.000	0.000

Table B1-417. Peak Hour Emissions from Tugboat Main Engine - 2014

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000

Table B1-418. Peak Hour Emissions from Tugboat Auxiliary Engines - 2014

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000

Table B1-419. Peak 8Hr Emissions from Tugboat Main Engine - 2014

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000

Table B1-420. Peak 8Hr Emissions from Tugboat Auxiliary Engines - 2014

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2014										
Containerships 10,000 - 11,000 TEU	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.001	0.000	0.157	0.000	0.000

Analysis Year	2023

Table B1-421. Tug Characteristics 2023

Tug	MY	# of Engines	HP per Engine	Load Factor
Average Tug Main	2016	2	1908	0.31
Average Tug Auxiliary	2020	2	182	0.43

Table B1-422. Tug Engine Composite Emission Factors 2023

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.03127	0.0288	0.0313	1.3187	0.0051	4.0408	0.1389	486.1939	0.0219	0.0099
Auxiliary	0.07207	0.0663	0.0721	3.8516	0.0051	3.8078	0.5730	486.1939	0.0219	0.0119

Table B1-423. Manuvering Time Duration 2023

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-424. Annual Tug Activity for Maneuvering to Berth 2023

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2023			
Containerships 12,000 - 13,000 TEU	104	2	0.6
Containerships 9,000 - 10,000 TEU		2	0.6
Containerships 8,000 - 9,000 TEU	104	2	0.6
Containerships 7,000 - 8,000 TEU		2	0.6
Containerships 5,000 - 6,000 TEU	104	2	0.6
Containerships 4,000 - 5,000 TEU		2	0.6
Containerships 3,000 - 4,000 TEU		2	0.6
Containerships 2,000 - 3,000 TEU		2	0.6
Containerships 1,000 - 2,000 TEU		2	0.6
General Cargo Vessels		2	0.6
Total	312		

Table B1-425. Annual Tug Activity for Tug Maneuvering to Anchorage 2023

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2023			
Containerships 12,000 - 13,000 TEU	8	2	0.3
Containerships 9,000 - 10,000 TEU	0	2	0.3
Containerships 8,000 - 9,000 TEU	8	2	0.3
Containerships 7,000 - 8,000 TEU	0	2	0.3
Containerships 5,000 - 6,000 TEU	8	2	0.3
Containerships 4,000 - 5,000 TEU	0	2	0.3
Containerships 3,000 - 4,000 TEU	0	2	0.3
Containerships 2,000 - 3,000 TEU	0	2	0.3
Containerships 1,000 - 2,000 TEU	0	2	0.3
General Cargo Vessels	0	2	0.3
Total	24		

Table B1-426. Annual Emissions from Tugboat Main Engine - 2023

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023											
Containerships 12,000 - 13,000 TEU	0.01	0.00	0.01	0.22	0.00	0.69	0.02	0.02	82.75	0.00	0.00
Containerships 9,000 - 10,000 TEU											
Containerships 8,000 - 9,000 TEU	0.01	0.00	0.01	0.22	0.00	0.69	0.02	0.02	82.75	0.00	0.00
Containerships 7,000 - 8,000 TEU											
Containerships 5,000 - 6,000 TEU	0.01	0.00	0.01	0.22	0.00	0.69	0.02	0.02	82.75	0.00	0.00
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.02	0.01	0.02	0.67	0.00	2.06	0.07	0.07	248.25	0.01	0.01

Table B1-427. Annual Emissions from Tugboat Auxiliary Engines - 2023

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023											
Containerships 12,000 - 13,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 9,000 - 10,000 TEU											
Containerships 8,000 - 9,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 7,000 - 8,000 TEU											
Containerships 5,000 - 6,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.00	0.00	0.00	0.26	0.00	0.26	0.04	0.04	32.85	0.00	0.00

Table B1-428. Peak Day Tug Activity 2023

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2023			
Containerships 12,000 - 13,000 TEU	1	2	0.6
Containerships 9,000 - 10,000 TEU	-	2	0.6
Containerships 8,000 - 9,000 TEU	1	2	0.6
Containerships 7,000 - 8,000 TEU	-	2	0.6
Containerships 5,000 - 6,000 TEU	1	2	0.6
Containerships 4,000 - 5,000 TEU	-	2	0.6
Containerships 3,000 - 4,000 TEU	-	2	0.6
Containerships 2,000 - 3,000 TEU	-	2	0.6
Containerships 1,000 - 2,000 TEU	-	2	0.6
General Cargo Vessels	-	2	0.6
Total	3		

Table B1-429. Peak Day Activity for Anchorage Shifts Tug Assist 2023

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2023			
Containerships 12,000 - 13,000 TEU	-	2	0.3
Containerships 9,000 - 10,000 TEU	-	2	0.3
Containerships 8,000 - 9,000 TEU	1	2	0.3
Containerships 7,000 - 8,000 TEU	-	2	0.3
Containerships 5,000 - 6,000 TEU	-	2	0.3
Containerships 4,000 - 5,000 TEU	-	2	0.3
Containerships 3,000 - 4,000 TEU	-	2	0.3
Containerships 2,000 - 3,000 TEU	-	2	0.3
Containerships 1,000 - 2,000 TEU	-	2	0.3
General Cargo Vessels	-	2	0.3
Total	1		

Table B1-430. Peak Day Emissions from Tugboat Main Engine - 2023

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.769	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	0.000	0.000	0.000	0.003	0.000	0.009	0.000	1.113	0.000	0.000
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.769	0.000	0.000
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.007	0.000	0.022	0.001	2.652	0.000	0.000

Table B1-431. Peak Day Emissions from Tugboat Auxiliary Engines - 2023

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.147	0.000	0.000
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.351	0.000	0.000
	0.44506	0.40946	0.44506	19.9414	0.06263	49.5695	2.34161	6004.67	0.27017	0.12485

Table B1-432. Peak 1hr Period Tug Activity 2023

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2023			
Containerships 12,000 - 13,000 TEU	1.00	-	0.47
Containerships 9,000 - 10,000 TEU	-	-	-
Containerships 8,000 - 9,000 TEU	1.00	1	0.47
Containerships 7,000 - 8,000 TEU	-	-	-
Containerships 5,000 - 6,000 TEU	1.00	-	0.30
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-433. Peak Hour Emissions from Tugboat Main Engine - 2023

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.296	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.296	0.000	0.000
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.190	0.000	0.000
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.782	0.000	0.000

Table B1-434. Peak Hour Emissions from Tugboat Auxiliary Engines - 2023

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.103	0.000	0.000

Table B1-435. Peak 8hr Period Tug Activity 2023

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2023			
Containerships 12,000 - 13,000 TEU	1	-	0.47
Containerships 9,000 - 10,000 TEU	-	-	-
Containerships 8,000 - 9,000 TEU	1	1	0.47
Containerships 7,000 - 8,000 TEU	-	-	-
Containerships 5,000 - 6,000 TEU	1	-	0.30
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-436. Peak 8Hr Emissions from Tugboat Main Engine - 2023

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.296	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	0.000	0.000	0.000	0.001	0.000	0.004	0.000	0.468	0.000	0.000
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.190	0.000	0.000
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.003	0.000	0.008	0.000	0.954	0.000	0.000

Table B1-437. Peak 8Hr Emissions from Tugboat Auxiliary Engines - 2023

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2023										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.062	0.000	0.000
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.025	0.000	0.000
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.126	0.000	0.000

Analysis Year	2030

Table B1-438. Tug Characteristics 2030

Tug	MY	# of Engines	HP per Engine	Load Factor
Average Tug Main	2016	2	1908	0.31
Average Tug Auxiliary	2020	2	182	0.43

Table B1-439. Tug Engine Composite Emission Factors 2030

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.04	0.03	0.04	1.40	0.01	4.35	0.16	486.19	0.02	0.01
Auxiliary	0.08	0.07	0.08	4.01	0.01	3.99	0.62	486.19	0.02	0.01

Table B1-440. Manuevering Time Duration 2030

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-441. Annual Tug Activity 2030

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2030			
Containerships 12,000 - 13,000 TEU	104	2	0.6
Containerships 9,000 - 10,000 TEU	104	2	0.6
Containerships 8,000 - 9,000 TEU		2	0.6
Containerships 7,000 - 8,000 TEU	104	2	0.6
Containerships 5,000 - 6,000 TEU		2	0.6
Containerships 4,000 - 5,000 TEU		2	0.6
Containerships 3,000 - 4,000 TEU		2	0.6
Containerships 2,000 - 3,000 TEU		2	0.6
Containerships 1,000 - 2,000 TEU		2	0.6
General Cargo Vessels		2	0.6
Total	312		

Table B1-442. Annual Tug Activity for Maneuvering to Anchorage 2030

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2030			
Containerships 12,000 - 13,000 TEU	8	2	0.3
Containerships 9,000 - 10,000 TEU	8	2	0.3
Containerships 8,000 - 9,000 TEU	0	2	0.3
Containerships 7,000 - 8,000 TEU	8	2	0.3
Containerships 5,000 - 6,000 TEU	0	2	0.3
Containerships 4,000 - 5,000 TEU	0	2	0.3
Containerships 3,000 - 4,000 TEU	0	2	0.3
Containerships 2,000 - 3,000 TEU	0	2	0.3
Containerships 1,000 - 2,000 TEU	0	2	0.3
General Cargo Vessels	0	2	0.3
Total	24		

Table B1-443. Annual Emissions from Tugboat Main Engine - 2030

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030											
Containerships 12,000 - 13,000 TEU	0.01	0.01	0.01	0.24	0.00	0.74	0.03	0.03	82.75	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.01	0.01	0.01	0.24	0.00	0.74	0.03	0.03	82.75	0.00	0.00
Containerships 8,000 - 9,000 TEU											
Containerships 7,000 - 8,000 TEU	0.01	0.01	0.01	0.24	0.00	0.74	0.03	0.03	82.75	0.00	0.00
Containerships 5,000 - 6,000 TEU											
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.02	0.02	0.02	0.72	0.00	2.22	0.08	0.08	248.25	0.01	0.01

Table B1-444. Annual Emissions from Tugboat Auxiliary Engines - 2030

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030											
Containerships 12,000 - 13,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 8,000 - 9,000 TEU											
Containerships 7,000 - 8,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 5,000 - 6,000 TEU											
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.01	0.01	0.01	0.27	0.00	0.27	0.04	0.04	32.85	0.00	0.00

Table B1-445. Peak Day Tug Activity 2030

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2030			
Containerships 12,000 - 13,000 TEU	1	2	0.6
Containerships 9,000 - 10,000 TEU	1	2	0.6
Containerships 8,000 - 9,000 TEU	-	2	0.6
Containerships 7,000 - 8,000 TEU	1	2	0.6
Containerships 5,000 - 6,000 TEU	-	2	0.6
Containerships 4,000 - 5,000 TEU	-	2	0.6
Containerships 3,000 - 4,000 TEU	-	2	0.6
Containerships 2,000 - 3,000 TEU	-	2	0.6
Containerships 1,000 - 2,000 TEU	-	2	0.6
General Cargo Vessels	-	2	0.6
Total	3		

Table B1-446. Peak Day Tug Activity for Anchorage Shifts 2030

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2030			
Containerships 12,000 - 13,000 TEU	-	2	0.3
Containerships 9,000 - 10,000 TEU	1	2	0.3
Containerships 8,000 - 9,000 TEU	-	2	0.3
Containerships 7,000 - 8,000 TEU	-	2	0.3
Containerships 5,000 - 6,000 TEU	-	2	0.3
Containerships 4,000 - 5,000 TEU	-	2	0.3
Containerships 3,000 - 4,000 TEU	-	2	0.3
Containerships 2,000 - 3,000 TEU	-	2	0.3
Containerships 1,000 - 2,000 TEU	-	2	0.3
General Cargo Vessels	-	2	0.3
Total	1		

Table B1-447. Peak Day Emissions from Tugboat Main Engine - 2030

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.002	0.000	0.007	0.000	0.769	0.000	0.000
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.003	0.000	0.010	0.000	1.113	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.002	0.000	0.007	0.000	0.769	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.008	0.000	0.024	0.001	2.652	0.000	0.000

Table B1-448. Peak Day Emissions from Tugboat Auxiliary Engines - 2030

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.147	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.351	0.000	0.000

Table B1-449. Peak 1hr Period Tug Activity 2030

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2030			
Containerships 12,000 - 13,000 TEU	1.00	-	-
Containerships 9,000 - 10,000 TEU	1.00	-	-
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 7,000 - 8,000 TEU	1.00	-	0.47
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3	-	

Table B1-450. Peak Hour Emissions from Tugboat Main Engine - 2030

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.296	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.296	0.000	0.000

Table B1-451. Peak Hour Emissions from Tugboat Auxiliary Engines - 2030

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000

Table B1-452. Peak 8hr Period Tug Activity2030

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2030			
Containerships 12,000 - 13,000 TEU	1	-	-
Containerships 9,000 - 10,000 TEU	1	1	0.47
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 7,000 - 8,000 TEU	1	-	0.47
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-453. Peak 8Hr Emissions from Tugboat Main Engine - 2030

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.004	0.000	0.468	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.296	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.007	0.000	0.764	0.000	0.000

Table B1-454. Peak 8Hr Emissions from Tugboat Auxiliary Engines - 2030

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2030										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.062	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.101	0.000	0.000

Analysis Year	2036

Table B1-455. Tug Characteristics 2036

Tug	MY	# of Engines	HP per Engine	Load Factor
Average Tug Main	2016	2	1908	0.31
Average Tug Auxiliary	2020	2	182	0.43

Table B1-456. Tug Engine Composite Emission Factors 2036

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.04	0.04	0.04	1.48	0.01	4.62	0.17	486.19	0.02	0.01
Auxiliary	0.09	0.08	0.09	4.15	0.01	4.15	0.66	486.19	0.02	0.01

Table B1-457. Maneuvering Time Duration 2036

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-458. Annual Tug Activity 2036

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2036			
Containerships 12,000 - 13,000 TEU	104	2	0.6
Containerships 9,000 - 10,000 TEU	104	2	0.6
Containerships 8,000 - 9,000 TEU		2	0.6
Containerships 7,000 - 8,000 TEU	104	2	0.6
Containerships 5,000 - 6,000 TEU		2	0.6
Containerships 4,000 - 5,000 TEU		2	0.6
Containerships 3,000 - 4,000 TEU		2	0.6
Containerships 2,000 - 3,000 TEU		2	0.6
Containerships 1,000 - 2,000 TEU		2	0.6
General Cargo Vessels		2	0.6
Total	312		

Table B1-459. Annual Tug Activity for Maneuvering to Anchorage 2036

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2036			
Containerships 12,000 - 13,000 TEU	8	2	0.3
Containerships 9,000 - 10,000 TEU	8	2	0.3
Containerships 8,000 - 9,000 TEU	0	2	0.3
Containerships 7,000 - 8,000 TEU	8	2	0.3
Containerships 5,000 - 6,000 TEU	0	2	0.3
Containerships 4,000 - 5,000 TEU	0	2	0.3
Containerships 3,000 - 4,000 TEU	0	2	0.3
Containerships 2,000 - 3,000 TEU	0	2	0.3
Containerships 1,000 - 2,000 TEU	0	2	0.3
General Cargo Vessels	0	2	0.3
Total	24		

Table B1-460. Annual Emissions from Tugboat Main Engine - 2036

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036											
Containerships 12,000 - 13,000 TEU	0.01	0.01	0.01	0.25	0.00	0.79	0.03	0.03	82.75	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.01	0.01	0.01	0.25	0.00	0.79	0.03	0.03	82.75	0.00	0.00
Containerships 8,000 - 9,000 TEU											
Containerships 7,000 - 8,000 TEU	0.01	0.01	0.01	0.25	0.00	0.79	0.03	0.03	82.75	0.00	0.00
Containerships 5,000 - 6,000 TEU											
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.02	0.02	0.02	0.76	0.00	2.36	0.09	0.09	248.25	0.01	0.01

Table B1-461. Annual Emissions from Tugboat Auxiliary Engines - 2036

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036											
Containerships 12,000 - 13,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.02	0.01	10.95	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.02	0.01	10.95	0.00	0.00
Containerships 8,000 - 9,000 TEU											
Containerships 7,000 - 8,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.02	0.01	10.95	0.00	0.00
Containerships 5,000 - 6,000 TEU											
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.01	0.01	0.01	0.28	0.00	0.28	0.05	0.04	32.85	0.00	0.00

Table B1-462. Peak Day Tug Activity 2036

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2036			
Containerships 12,000 - 13,000 TEU	1	2	0.6
Containerships 9,000 - 10,000 TEU	1	2	0.6
Containerships 8,000 - 9,000 TEU	-	2	0.6
Containerships 7,000 - 8,000 TEU	1	2	0.6
Containerships 5,000 - 6,000 TEU	-	2	0.6
Containerships 4,000 - 5,000 TEU	-	2	0.6
Containerships 3,000 - 4,000 TEU	-	2	0.6
Containerships 2,000 - 3,000 TEU	-	2	0.6
Containerships 1,000 - 2,000 TEU	-	2	0.6
General Cargo Vessels	-	2	0.6
Total	3		

Table B1-463. Peak Day Tug Activity forAnchorage Shifts 2036

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2036			
Containerships 12,000 - 13,000 TEU	-	2	0.3
Containerships 9,000 - 10,000 TEU	1	2	0.3
Containerships 8,000 - 9,000 TEU	-	2	0.3
Containerships 7,000 - 8,000 TEU	-	2	0.3
Containerships 5,000 - 6,000 TEU	-	2	0.3
Containerships 4,000 - 5,000 TEU	-	2	0.3
Containerships 3,000 - 4,000 TEU	-	2	0.3
Containerships 2,000 - 3,000 TEU	-	2	0.3
Containerships 1,000 - 2,000 TEU	-	2	0.3
General Cargo Vessels	-	2	0.3
Total	1		

Table B1-464. Peak Day Emissions from Tugboat Main Engine - 2036

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.002	0.000	0.007	0.000	0.769	0.000	0.000
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.003	0.000	0.011	0.000	1.113	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.002	0.000	0.007	0.000	0.769	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.008	0.000	0.025	0.001	2.652	0.000	0.000

Table B1-465. Peak Day Emissions from Tugboat Auxiliary Engines - 2036

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.147	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.351	0.000	0.000

Table B1-466. Peak 1hr Period Tug Activity 2036

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2036			
Containerships 12,000 - 13,000 TEU	1.00	-	-
Containerships 9,000 - 10,000 TEU	1.00	-	-
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 7,000 - 8,000 TEU	1.00	-	0.47
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-467. Peak Hour Emissions from Tugboat Main Engine - 2036

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.296	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.296	0.000	0.000

Table B1-468. Peak Hour Emissions from Tugboat Auxiliary Engines - 2036

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000

Table B1-469. Peak 8hr Period Tug Activity 2036

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2036			
Containerships 12,000 - 13,000 TEU	1	-	-
Containerships 9,000 - 10,000 TEU	1	1	0.47
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 7,000 - 8,000 TEU	1	-	0.47
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-470. Peak 8Hr Emissions from Tugboat Main Engine - 2036

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.004	0.000	0.468	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.003	0.000	0.296	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.007	0.000	0.764	0.000	0.000

Table B1-471. Peak 8Hr Emissions from Tugboat Auxiliary Engines - 2036

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2036										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.062	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.101	0.000	0.000

Analysis Year	2045

Table B1-472. Tug Characteristics 2045

Tug	MY	# of Engines	HP per Engine	Load Factor
Average Tug Main	2037	2	1908	0.31
Average Tug Auxiliary	2043	2	182	0.43

Table B1-473. Tug Engine Composite Emission Factors 2045

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.03	0.03	0.03	1.33	0.01	4.09	0.14	486.19	0.02	0.01
Auxiliary	0.07	0.07	0.07	3.83	0.01	3.78	0.57	486.19	0.02	0.01

Table B1-474. Maneuvering Time Duration 2045

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-475. Annual Tug Activity 2045

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2045			
Containerships 12,000 - 13,000 TEU	104	2	0.6
Containerships 9,000 - 10,000 TEU	104	2	0.6
Containerships 8,000 - 9,000 TEU		2	0.6
Containerships 7,000 - 8,000 TEU	104	2	0.6
Containerships 5,000 - 6,000 TEU		2	0.6
Containerships 4,000 - 5,000 TEU		2	0.6
Containerships 3,000 - 4,000 TEU		2	0.6
Containerships 2,000 - 3,000 TEU		2	0.6
Containerships 1,000 - 2,000 TEU		2	0.6
General Cargo Vessels		2	0.6
Total	312		

Table B1-476. Annual Tug Activity forManeuvering to Anchorage 2045

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2045			
Containerships 12,000 - 13,000 TEU	8	2	0.3
Containerships 9,000 - 10,000 TEU	8	2	0.3
Containerships 8,000 - 9,000 TEU	0	2	0.3
Containerships 7,000 - 8,000 TEU	8	2	0.3
Containerships 5,000 - 6,000 TEU	0	2	0.3
Containerships 4,000 - 5,000 TEU	0	2	0.3
Containerships 3,000 - 4,000 TEU	0	2	0.3
Containerships 2,000 - 3,000 TEU	0	2	0.3
Containerships 1,000 - 2,000 TEU	0	2	0.3
General Cargo Vessels	0	2	0.3
Total	24		

Table B1-477. Annual Emissions from Tugboat Main Engine - 2045

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045											
Containerships 12,000 - 13,000 TEU	0.01	0.01	0.01	0.23	0.00	0.70	0.03	0.02	82.75	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.01	0.01	0.01	0.23	0.00	0.70	0.03	0.02	82.75	0.00	0.00
Containerships 8,000 - 9,000 TEU											
Containerships 7,000 - 8,000 TEU	0.01	0.01	0.01	0.23	0.00	0.70	0.03	0.02	82.75	0.00	0.00
Containerships 5,000 - 6,000 TEU											
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.02	0.02	0.02	0.68	0.00	2.09	0.08	0.07	248.25	0.01	0.01

Table B1-478. Annual Emissions from Tugboat Auxiliary Engines - 2045

	Tons Per Year								GHGs (tons/yr)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*VOC*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045											
Containerships 12,000 - 13,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 9,000 - 10,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 8,000 - 9,000 TEU											
Containerships 7,000 - 8,000 TEU	0.00	0.00	0.00	0.09	0.00	0.09	0.01	0.01	10.95	0.00	0.00
Containerships 5,000 - 6,000 TEU											
Containerships 4,000 - 5,000 TEU											
Containerships 3,000 - 4,000 TEU											
Containerships 2,000 - 3,000 TEU											
Containerships 1,000 - 2,000 TEU											
General Cargo Vessels											
Total	0.00	0.00	0.00	0.26	0.00	0.26	0.04	0.04	32.85	0.00	0.00

Table B1-479. Peak Day Tug Activity 2045

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2045			
Containerships 12,000 - 13,000 TEU	1	2	0.6
Containerships 9,000 - 10,000 TEU	1	2	0.6
Containerships 8,000 - 9,000 TEU	-	2	0.6
Containerships 7,000 - 8,000 TEU	1	2	0.6
Containerships 5,000 - 6,000 TEU	-	2	0.6
Containerships 4,000 - 5,000 TEU	-	2	0.6
Containerships 3,000 - 4,000 TEU	-	2	0.6
Containerships 2,000 - 3,000 TEU	-	2	0.6
Containerships 1,000 - 2,000 TEU	-	2	0.6
General Cargo Vessels	-	2	0.6
Total	3		

Table B1-480. Peak Day Tug Activity for Anchorage Shifts 2045

Project Scenario/Ship Type	*Transits*	*No. of tugs per call*	*Average assist duration (hr)*
Project Year 2045			
Containerships 12,000 - 13,000 TEU	-	2	0.3
Containerships 9,000 - 10,000 TEU	1	2	0.3
Containerships 8,000 - 9,000 TEU	-	2	0.3
Containerships 7,000 - 8,000 TEU	-	2	0.3
Containerships 5,000 - 6,000 TEU	-	2	0.3
Containerships 4,000 - 5,000 TEU	-	2	0.3
Containerships 3,000 - 4,000 TEU	-	2	0.3
Containerships 2,000 - 3,000 TEU	-	2	0.3
Containerships 1,000 - 2,000 TEU	-	2	0.3
General Cargo Vessels	-	2	0.3
Total	1		

Table B1-481. Peak Day Emissions from Tugboat Main Engine - 2045

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.769	0.000	0.000
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.003	0.000	0.009	0.000	1.113	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.769	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.007	0.000	0.022	0.001	2.652	0.000	0.000

Table B1-482. Peak Day Emissions from Tugboat Auxiliary Engines - 2045

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045										
Containerships 12,000 - 13,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.147	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.102	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.351	0.000	0.000

Table B1-483. Peak 1hr Period Tug Activity 2045

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2045			
Containerships 12,000 - 13,000 TEU	1.00	-	-
Containerships 9,000 - 10,000 TEU	1.00	-	-
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 7,000 - 8,000 TEU	1.00	-	0.47
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-484. Peak Hour Emissions from Tugboat Main Engine - 2045

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.296	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.296	0.000	0.000

Table B1-485. Peak Hour Emissions from Tugboat Auxiliary Engines - 2045

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000

Table B1-486. Peak 8hr Period Tug Activity 2045

Project Scenario/Ship Type	*Transits*	*Shifts*	*Average assist duration (hr)*
Project Year 2045			
Containerships 12,000 - 13,000 TEU	1	-	-
Containerships 9,000 - 10,000 TEU	1	1	0.47
Containerships 8,000 - 9,000 TEU	-	-	-
Containerships 7,000 - 8,000 TEU	1	-	0.47
Containerships 5,000 - 6,000 TEU	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-
General Cargo Vessels	-	-	-
Total	3		

Table B1-487. Peak 8Hr Emissions from Tugboat Main Engine - 2045

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.001	0.000	0.004	0.000	0.468	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.001	0.000	0.002	0.000	0.296	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.002	0.000	0.006	0.000	0.764	0.000	0.000

Table B1-488. Peak 8Hr Emissions from Tugboat Auxiliary Engines - 2045

	Tons							GHGs (tons)		
Project Scenario/Activity	*PM10*	*PM2.5*	*DPM*	*NOx*	*SOx*	*CO*	*HC*	*CO2*	*N2O*	*CH4*
Project Year 2045										
Containerships 12,000 - 13,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.062	0.000	0.000
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.039	0.000	0.000
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-
Total	0.000	0.000	0.000	0.001	0.000	0.001	0.000	0.101	0.000	0.000

2008 EIR/EIS
Mitigated Emissions Inventory

Table B1-489. FEIR Mitigated Scenario Peak 1hr Emissions by Source Category and Analysis Year in lbs/hr

		Source category									
Values	Year	CHE	OGV	Harbor Craft	Onsite Trucks	Offsite Trucks	Onsite PC	Offsite PC	Rail Offsite	Rail Onsite	Grand Total
Sum of NOx	2014	54.31	542.39	7.71	19.52	139.64	0.01	0.18	59.40	4.36	827.52
	2023	11.45	93.87	0.00	9.62	37.54	0.01	0.13	82.32	4.04	238.98
	2030	8.93	151.51	2.36	12.29	29.81	0.00	0.09	59.81	2.87	267.68
	2036	10.18	86.39	2.47	12.72	25.83	0.00	0.06	38.67	2.02	178.35
	2045	10.37	50.60	2.24	12.82	31.07	0.00	0.06	20.95	1.29	129.39
Sum of VOC	2014	17.22	28.32	0.84	1.01	3.07	0.00	0.05	2.61	0.20	53.32
	2023	8.81	3.50	0.00	0.35	1.17	0.00	0.03	2.95	0.15	16.97
	2030	4.41	20.10	0.31	0.42	1.44	0.00	0.02	2.06	0.10	28.86
	2036	8.97	20.10	0.33	0.43	1.56	0.00	0.01	1.31	0.07	32.79
	2045	9.65	20.10	0.28	0.43	1.96	0.00	0.01	0.77	0.05	33.24
Sum of CO	2014	285.52	27.66	4.94	3.80	10.08	0.09	1.91	13.38	1.05	348.42
	2023	40.45	8.87	0.00	6.87	21.21	0.10	1.62	22.93	1.16	103.21
	2030	35.21	29.19	5.94	4.61	16.31	0.07	1.17	24.01	1.15	117.66
	2036	44.14	29.19	6.29	3.79	15.16	0.05	0.90	22.70	1.14	123.37
	2045	45.68	29.19	5.58	3.53	18.76	0.05	0.82	20.89	1.14	125.64
Sum of PM25	2014	0.77	6.78	0.25	0.05	1.30	0.00	0.03	1.64	0.11	10.92
	2023	0.39	2.25	0.00	0.03	0.89	0.00	0.06	1.74	0.08	5.44
	2030	0.31	4.78	0.05	0.03	0.95	0.00	0.06	1.16	0.05	7.41
	2036	0.42	4.78	0.06	0.03	0.96	0.00	0.06	0.67	0.03	7.02
	2045	0.44	4.78	0.05	0.03	0.96	0.00	0.06	0.32	0.02	6.66
Sum of PM10	2014	0.78	7.37	0.27	0.08	2.48	0.00	0.07	1.76	0.12	12.93
	2023	0.42	2.44	0.00	0.07	2.20	0.01	0.15	1.87	0.09	7.24
	2030	0.34	5.18	0.06	0.08	2.39	0.01	0.15	1.22	0.06	9.48
	2036	0.46	5.18	0.07	0.08	2.41	0.01	0.15	0.69	0.03	9.06
	2045	0.48	5.18	0.05	0.08	2.42	0.01	0.15	0.32	0.02	8.69
Sum of PM10TW	2014				0.02	0.67	0.00	0.01			0.70
	2023				0.02	0.75	0.00	0.03			0.80
	2030				0.03	0.83	0.00	0.03			0.88
	2036				0.03	0.83	0.00	0.03			0.89
	2045				0.03	0.84	0.00	0.03			0.89
Sum of PM10BW	2014				0.03	1.15	0.00	0.05			1.23
	2023				0.04	1.29	0.00	0.12			1.45
	2030				0.04	1.42	0.00	0.12			1.59
	2036				0.04	1.43	0.00	0.12			1.60
	2045				0.04	1.44	0.00	0.12			1.60
Sum of SOx	2014	0.06	13.82	0.01	0.03	0.31	0.00	0.00	0.05	0.00	14.29
	2023	0.09	5.65	0.00	0.03	0.26	0.00	0.01	0.09	0.00	6.13
	2030	0.10	6.87	0.01	0.03	0.31	0.00	0.01	0.09	0.00	7.42
	2036	0.10	6.87	0.01	0.03	0.32	0.00	0.01	0.09	0.00	7.42
	2045	0.10	6.87	0.01	0.03	0.32	0.00	0.01	0.08	0.00	7.42
Sum of CO2	2014	14,230.38	23,184.11	626.34	3,199.90	31,638.74	26.36	465.81	5,161.76	402.39	78,935.79
	2023	21,119.81	8,475.65	0.00	3,727.39	36,078.44	50.49	735.22	8,847.72	446.52	79,481.23
	2030	23,557.88	10,303.92	670.02	3,687.03	35,690.31	43.27	607.99	9,265.73	443.63	84,269.77
	2036	23,572.39	10,303.92	670.02	3,545.47	34,912.35	38.68	529.30	8,758.95	439.16	82,770.24
	2045	23,557.64	10,303.92	670.02	3,483.93	35,633.42	37.61	531.58	8,061.64	439.10	82,718.87
Sum of CH4	2014	1.24	0.54	0.01	0.06	0.17	0.00	0.02	0.42	0.03	2.48
	2023	1.31	0.07	0.00	0.07	0.22	0.00	0.01	0.72	0.04	2.44
	2030	1.54	0.10	0.01	0.05	0.16	0.00	0.01	0.75	0.04	2.65
	2036	1.34	0.10	0.01	0.04	0.14	0.00	0.00	0.71	0.04	2.38
	2045	0.82	0.10	0.01	0.04	0.17	0.00	0.00	0.65	0.04	1.84
Sum of N2O	2014	0.00	1.55	0.03	0.18	1.17	0.00	0.01	0.14	0.01	3.09
	2023	0.00	0.49	0.00	0.21	1.53	0.00	0.01	0.23	0.01	2.48
	2030	0.00	0.57	0.03	0.21	1.36	0.00	0.00	0.24	0.01	2.44
	2036	0.00	0.57	0.03	0.21	1.27	0.00	0.00	0.23	0.01	2.33
	2045	0.00	0.57	0.03	0.20	1.24	0.00	0.00	0.21	0.01	2.27
Sum of DPM	2014	0.07	6.66	0.27	0.01	0.22	0.00	0.00	1.76	0.12	9.11
	2023	0.16	1.92	0.00	0.00	0.01	0.00	0.00	1.87	0.09	4.05
	2030	0.11	4.68	0.06	0.00	0.01	0.00	0.00	1.22	0.06	6.12
	2036	0.16	4.68	0.07	0.00	0.01	0.00	0.00	0.69	0.03	5.63
	2045	0.21	4.68	0.05	0.00	0.01	0.00	0.00	0.32	0.02	5.28

Table B1-490. Peak hour FEIR Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/1-hour

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	0.1		0.1
		2023	0.2		0.2
		2030	0.1		0.1
		2036	0.2		0.2
		2045	0.2		0.2
	LPG	2014	0.7		0.0
	LNG	2023	0.3		0.0
		2030	0.2		0.0
		2036	0.3		0.0
		2045	0.3		0.0
OGV	MDO/MGO	2014	7.4		6.7
		2023	2.4		1.9
		2030	5.2		4.7
		2036	5.2		4.7
		2045	5.2		4.7
Harbor Craft	MDO/MGO	2014	0.3		0.3
		2023	0.0		0.0
		2030	0.1		0.1
		2036	0.1		0.1
		2045	0.1		0.1
Onsite Trucks	Diesel	2014	0.0	1.6	0.0
		2023	0.0	2.0	0.0
		2030	0.0	2.2	0.0
		2036	0.0	2.2	0.0
		2045	0.0	2.2	0.0
	95% LNG+5% Diesel	2014	0.1	0.1	0.0
		2023	0.1	0.2	0.0
		2030	0.1	0.2	0.0
		2036	0.1	0.2	0.0
		2045	0.1	0.2	0.0
Offsite Trucks	Diesel / LNG	2014	2.5	1.4	0.2
		2023	2.2	1.7	0.0
		2030	2.4	1.8	0.0
		2036	2.4	1.8	0.0
		2045	2.4	1.8	0.0
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.0	0.0
		2023	0.0	0.0	0.0
		2030	0.0	0.0	0.0
		2036	0.0	0.0	0.0
		2045	0.0	0.0	0.0
Offsite PC	Diesel/Gas/Elec	2014	0.1	0.1	0.0
		2023	0.1	0.2	0.0
		2030	0.2	0.3	0.0
		2036	0.1	0.2	0.0
		2045	0.1	0.2	0.0
Rail Offsite	Diesel	2014	1.8		1.8
		2023	1.9		1.9
		2030	1.2		1.2
		2036	0.7		0.7
		2045	0.3		0.3
Rail Onsite	Diesel	2014	0.1		0.1
		2023	0.1		0.1
		2030	0.1		0.1
		2036	0.0		0.0
		2045	0.0		0.0
Grand Total			**47.4**	**20.9**	**30.2**

Table B1-491. FEIR Mitigated Scenario Peak 8-hr Emissions by Source Category and Analysis Year in lbs/8-hr

		Source category									
Values	Year	CHE	OGV	Harbor Craft	Onsite Trucks	Offsite Trucks	Onsite PC	Offsite PC	Rail Offsite	Rail Onsite	Grand Total
Sum of NOx	2014	377.69	3,471.28	7.71	135.71	971.06	0.05	1.24	475.24	34.90	5,474.88
	2023	82.29	1,802.74	7.17	69.15	269.91	0.05	0.97	658.55	32.28	2,923.10
	2030	64.22	1,634.52	6.08	88.37	214.31	0.03	0.61	478.50	22.95	2,509.60
	2036	73.21	947.69	6.37	91.42	185.72	0.02	0.45	309.38	16.14	1,630.41
	2045	74.55	519.11	5.77	92.15	223.36	0.02	0.40	167.58	10.28	1,093.22
Sum of VOC	2014	119.72	173.39	0.84	7.05	21.36	0.03	0.38	20.84	1.56	345.17
	2023	63.36	54.67	0.89	2.53	8.43	0.02	0.20	23.59	1.20	154.89
	2030	31.69	161.06	0.79	3.04	10.38	0.01	0.12	16.48	0.83	224.41
	2036	64.50	161.06	0.86	3.08	11.21	0.01	0.08	10.48	0.59	251.88
	2045	69.37	161.06	0.72	3.08	14.07	0.01	0.07	6.14	0.41	254.93
Sum of CO	2014	1,985.48	189.53	4.94	26.43	70.07	0.64	13.26	107.01	8.39	2,405.74
	2023	290.76	85.54	17.83	49.41	152.50	0.69	11.64	183.45	9.29	801.10
	2030	253.13	293.64	15.33	33.12	117.23	0.50	8.39	192.11	9.23	922.68
	2036	317.35	293.64	16.23	27.22	108.99	0.39	6.46	181.60	9.13	961.01
	2045	328.40	293.64	14.40	25.35	134.85	0.34	5.91	167.15	9.13	979.18
Sum of PM25	2014	5.37	48.62	0.25	0.35	9.01	0.01	0.20	13.09	0.91	77.80
	2023	2.80	21.96	0.15	0.21	6.37	0.02	0.44	13.93	0.65	46.52
	2030	2.26	44.17	0.14	0.24	6.86	0.02	0.45	9.25	0.42	63.81
	2036	3.03	44.17	0.16	0.24	6.88	0.02	0.43	5.38	0.26	60.57
	2045	3.15	44.17	0.12	0.24	6.93	0.02	0.43	2.54	0.14	57.74
Sum of PM10	2014	5.41	52.87	0.27	0.59	17.25	0.02	0.48	14.04	0.97	91.89
	2023	3.04	23.76	0.16	0.51	15.80	0.04	1.05	14.95	0.70	60.00
	2030	2.46	47.83	0.15	0.57	17.17	0.04	1.10	9.74	0.44	79.50
	2036	3.30	47.83	0.17	0.57	17.29	0.04	1.05	5.54	0.27	76.06
	2045	3.42	47.83	0.13	0.57	17.38	0.04	1.07	2.55	0.14	73.13
Sum of PM10TW	2014				0.13	4.65	0.00	0.08			4.86
	2023				0.17	5.42	0.01	0.18			5.78
	2030				0.19	5.93	0.01	0.19			6.32
	2036				0.19	5.99	0.01	0.18			6.37
	2045				0.19	6.02	0.01	0.19			6.40
Sum of PM10BW	2014				0.23	7.97	0.01	0.37			8.58
	2023				0.29	9.30	0.03	0.83			10.45
	2030				0.32	10.18	0.03	0.88			11.41
	2036				0.32	10.28	0.03	0.85			11.48
	2045				0.32	10.32	0.03	0.86			11.54
Sum of SOx	2014	0.44	101.25	0.01	0.18	2.18	0.00	0.03	0.42	0.03	104.53
	2023	0.63	56.67	0.02	0.18	1.87	0.00	0.05	0.71	0.04	60.19
	2030	0.70	68.83	0.02	0.20	2.25	0.00	0.04	0.75	0.04	72.84
	2036	0.70	68.83	0.02	0.20	2.31	0.00	0.04	0.71	0.04	72.85
	2045	0.70	68.83	0.02	0.20	2.32	0.00	0.04	0.65	0.04	72.80
Sum of CO2	2014	98,956.03	171,576.32	626.34	22,251.65	220,011.29	183.33	3,239.16	41,294.05	3,219.16	561,357.34
	2023	151,828.63	85,196.35	2,160.02	26,795.87	259,364.96	362.93	5,285.45	70,781.72	3,572.15	605,348.10
	2030	169,355.68	103,487.14	1,729.30	26,505.75	256,574.74	311.03	4,370.77	74,125.82	3,549.01	640,009.25
	2036	169,459.98	103,487.14	1,729.30	25,488.13	250,982.03	278.03	3,805.10	70,071.64	3,513.29	628,814.63
	2045	169,353.96	103,487.14	1,729.30	25,045.68	256,165.77	270.41	3,821.49	64,493.15	3,512.84	627,879.73
Sum of CH4	2014	8.60	3.29	0.01	0.39	1.17	0.01	0.11	3.34	0.26	17.18
	2023	9.42	1.02	0.04	0.54	1.61	0.01	0.08	5.73	0.29	18.74
	2030	11.06	1.31	0.04	0.34	1.14	0.01	0.05	6.00	0.29	20.23
	2036	9.64	1.31	0.04	0.28	1.01	0.00	0.03	5.67	0.28	18.27
	2045	5.92	1.31	0.04	0.25	1.24	0.00	0.03	5.22	0.28	14.30
Sum of N2O	2014	0.00	10.71	0.03	1.27	8.16	0.00	0.05	1.09	0.08	21.39
	2023	0.00	5.60	0.10	1.50	10.98	0.00	0.04	1.86	0.09	20.17
	2030	0.00	5.68	0.08	1.53	9.78	0.00	0.03	1.95	0.09	19.15
	2036	0.00	5.68	0.08	1.49	9.15	0.00	0.02	1.84	0.09	18.36
	2045	0.00	5.68	0.08	1.47	8.91	0.00	0.02	1.70	0.09	17.96
Sum of DPM	2014	0.48	46.95	0.27	0.08	1.55	0.00	0.00	14.04	0.97	64.35
	2023	1.15	19.62	0.16	0.00	0.05	0.00	0.00	14.95	0.70	36.64
	2030	0.78	43.83	0.15	0.00	0.05	0.00	0.00	9.74	0.44	55.00
	2036	1.12	43.83	0.17	0.00	0.05	0.00	0.00	5.54	0.27	50.98
	2045	1.50	43.83	0.13	0.00	0.05	0.00	0.00	2.55	0.14	48.21

Table B1-492. Peak 8-hr FEIR Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/8-hr

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	0.5		0.5
		2023	1.2		1.2
		2030	0.8		0.8
		2036	1.1		1.1
		2045	1.5		1.5
	LPG	2014	4.9		0.0
	LNG	2023	1.9		0.0
		2030	1.7		0.0
		2036	2.2		0.0
		2045	1.9		0.0
OGV	MDO/MGO	2014	52.9		47.0
		2023	23.8		19.6
		2030	47.8		43.8
		2036	47.8		43.8
		2045	47.8		43.8
Harbor Craft	MDO/MGO	2014	0.3		0.3
		2023	0.2		0.2
		2030	0.1		0.1
		2036	0.2		0.2
		2045	0.1		0.1
Onsite Trucks	Diesel	2014	0.2	11.1	0.1
		2023	0.0	14.2	0.0
		2030	0.0	15.8	0.0
		2036	0.0	16.0	0.0
		2045	0.0	16.0	0.0
	95% LNG+5% Diesel	2014	0.4	1.0	0.0
		2023	0.5	1.3	0.0
		2030	0.6	1.4	0.0
		2036	0.6	1.4	0.0
		2045	0.6	1.4	0.0
Offsite Trucks	Diesel / LNG	2014	17.3	9.8	1.6
		2023	15.8	11.9	0.1
		2030	17.2	12.9	0.1
		2036	17.3	12.8	0.1
		2045	17.4	12.8	0.1
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.1	0.0
		2023	0.0	0.3	0.0
		2030	0.0	0.4	0.0
		2036	0.0	0.4	0.0
		2045	0.0	0.4	0.0
Offsite PC	Diesel/Gas/Elec	2014	0.5	0.8	0.0
		2023	1.1	1.8	0.0
		2030	1.1	1.8	0.0
		2036	1.0	1.7	0.0
		2045	1.1	1.7	0.0
Rail Offsite	Diesel	2014	14.0		14.0
		2023	14.9		14.9
		2030	9.7		9.7
		2036	5.5		5.5
		2045	2.5		2.5
Rail Onsite	Diesel	2014	1.0		1.0
		2023	0.7		0.7
		2030	0.4		0.4
		2036	0.3		0.3
		2045	0.1		0.1
Grand Total			**380.6**	**149.2**	**255.2**

Table B1-493. FEIR Mitigated Scenario Annual Emissions by Source Category in tons/year

		Source category									
Values	Year	CHE	OGV	Harbor Craft	Onsite Trucks	Offsite Trucks	Onsite PC	Offsite PC	Rail Offsite	Rail Onsite	Grand Total
Sum of NOx	2014	92.76	181.51	2.06	33.33	238.49	0.01	0.31	171.44	12.59	732.50
	2023	19.18	279.30	0.93	16.12	62.92	0.01	0.23	243.95	11.96	634.59
	2030	14.97	222.03	0.99	20.60	49.96	0.01	0.14	177.25	8.50	494.45
	2036	17.07	144.29	1.04	21.31	43.29	0.01	0.10	114.60	5.98	347.69
	2045	17.38	63.73	0.94	21.48	52.07	0.00	0.09	62.08	3.81	221.57
Sum of VOC	2014	29.40	6.67	0.19	1.73	5.25	0.01	0.09	7.52	0.56	51.43
	2023	14.77	9.72	0.12	0.59	1.96	0.01	0.05	8.74	0.44	36.39
	2030	7.39	18.08	0.13	0.71	2.42	0.00	0.03	6.10	0.31	35.17
	2036	15.03	18.08	0.14	0.72	2.61	0.00	0.02	3.88	0.22	40.71
	2045	16.17	18.08	0.12	0.72	3.28	0.00	0.02	2.27	0.15	40.81
Sum of CO	2014	487.63	9.93	1.14	6.49	17.21	0.16	3.26	38.60	3.03	567.44
	2023	67.78	16.82	2.32	11.52	35.55	0.16	2.71	67.95	3.44	208.26
	2030	59.00	35.01	2.49	7.72	27.33	0.12	1.96	71.16	3.42	208.21
	2036	73.97	35.01	2.64	6.34	25.41	0.09	1.51	67.27	3.38	215.63
	2045	76.55	35.01	2.34	5.91	31.43	0.08	1.38	61.92	3.38	218.00
Sum of PM25	2014	1.32	2.69	0.07	0.09	2.21	0.00	0.05	4.72	0.33	11.48
	2023	0.65	3.51	0.02	0.05	1.49	0.00	0.10	5.16	0.24	11.23
	2030	0.53	5.16	0.02	0.06	1.60	0.00	0.10	3.43	0.16	11.06
	2036	0.71	5.16	0.03	0.06	1.60	0.00	0.10	1.99	0.10	9.75
	2045	0.73	5.16	0.02	0.06	1.61	0.00	0.10	0.94	0.05	8.69
Sum of PM10	2014	1.33	2.95	0.08	0.14	4.24	0.00	0.12	5.07	0.35	14.28
	2023	0.71	3.80	0.02	0.12	3.68	0.01	0.25	5.54	0.26	14.38
	2030	0.57	5.59	0.02	0.13	4.00	0.01	0.26	3.61	0.16	14.36
	2036	0.77	5.59	0.03	0.13	4.03	0.01	0.24	2.05	0.10	12.96
	2045	0.80	5.59	0.02	0.13	4.05	0.01	0.25	0.94	0.05	11.85
Sum of PM10TW	2014				0.03	1.14	0.00	0.02			1.19
	2023				0.04	1.26	0.00	0.04			1.35
	2030				0.04	1.38	0.00	0.04			1.47
	2036				0.04	1.40	0.00	0.04			1.49
	2045				0.04	1.40	0.00	0.04			1.49
Sum of PM10BW	2014				0.06	1.96	0.00	0.09			2.11
	2023				0.07	2.17	0.01	0.19			2.44
	2030				0.08	2.37	0.01	0.21			2.66
	2036				0.08	2.40	0.01	0.20			2.68
	2045				0.08	2.41	0.01	0.20			2.69
Sum of SOx	2014	0.11	7.02	0.00	0.04	0.53	0.00	0.01	0.15	0.01	7.88
	2023	0.15	8.45	0.00	0.04	0.44	0.00	0.01	0.26	0.01	9.37
	2030	0.16	8.55	0.00	0.05	0.52	0.00	0.01	0.28	0.01	9.59
	2036	0.16	8.55	0.00	0.05	0.54	0.00	0.01	0.26	0.01	9.59
	2045	0.16	8.55	0.00	0.05	0.54	0.00	0.01	0.24	0.01	9.57
Sum of CO2	2014	24,303.38	11,933.91	147.82	5,465.00	54,034.28	45.03	795.53	14,896.86	1,161.31	112,783.11
	2023	35,391.18	12,727.55	281.10	6,246.15	60,457.85	84.60	1,232.04	26,219.68	1,323.23	143,963.38
	2030	39,476.73	12,883.51	281.10	6,178.53	59,807.45	72.50	1,018.83	27,458.44	1,314.66	148,491.74
	2036	39,501.04	12,883.51	281.10	5,941.32	58,503.79	64.81	886.97	25,956.64	1,301.43	145,320.61
	2045	39,476.33	12,883.51	281.10	5,838.19	59,712.12	63.03	890.79	23,890.20	1,301.26	144,336.52
Sum of CH4	2014	2.11	0.13	0.00	0.10	0.29	0.00	0.03	1.21	0.09	3.96
	2023	2.20	0.17	0.01	0.13	0.38	0.00	0.02	2.12	0.11	5.12
	2030	2.58	0.17	0.01	0.08	0.27	0.00	0.01	2.22	0.11	5.44
	2036	2.25	0.17	0.01	0.06	0.24	0.00	0.01	2.10	0.10	4.93
	2045	1.38	0.17	0.01	0.06	0.29	0.00	0.01	1.93	0.10	3.95
Sum of N2O	2014	0.00	0.82	0.01	0.31	2.00	0.00	0.01	0.39	0.03	3.58
	2023	0.00	0.84	0.01	0.35	2.56	0.00	0.01	0.69	0.03	4.49
	2030	0.00	0.74	0.01	0.36	2.28	0.00	0.01	0.72	0.03	4.15
	2036	0.00	0.74	0.01	0.35	2.13	0.00	0.01	0.68	0.03	3.96
	2045	0.00	0.74	0.01	0.34	2.08	0.00	0.01	0.63	0.03	3.84
Sum of DPM	2014	0.12	2.10	0.08	0.02	0.38	0.00	0.00	5.07	0.35	8.11
	2023	0.27	3.19	0.02	0.00	0.01	0.00	0.00	5.54	0.26	9.29
	2030	0.18	4.99	0.02	0.00	0.01	0.00	0.00	3.61	0.16	8.98
	2036	0.26	4.99	0.03	0.00	0.01	0.00	0.00	2.05	0.10	7.44
	2045	0.35	4.99	0.02	0.00	0.01	0.00	0.00	0.94	0.05	6.37

Table B1-494. Annual FEIR Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in ton/year

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	0.1		0.1
		2023	0.3		0.3
		2030	0.2		0.2
		2036	0.3		0.3
		2045	0.3		0.3
	LPG	2014	1.2		0.0
	LNG	2023	0.4		0.0
		2030	0.4		0.0
		2036	0.5		0.0
		2045	0.4		0.0
OGV	MGO/MDO	2014	3.0		2.1
		2023	3.8		3.2
		2030	5.6		5.0
		2036	5.6		5.0
		2045	5.6		5.0
Harbor Craft	MGO/MDO	2014	0.1		0.1
		2023	0.0		0.0
		2030	0.0		0.0
		2036	0.0		0.0
		2045	0.0		0.0
Onsite Trucks	Diesel	2014	0.0	2.7	0.0
		2023	0.0	3.3	0.0
		2030	0.0	3.7	0.0
		2036	0.0	3.7	0.0
		2045	0.0	3.7	0.0
	95% LNG+5% Diesel	2014	0.1	0.2	0.0
		2023	0.1	0.3	0.0
		2030	0.1	0.3	0.0
		2036	0.1	0.3	0.0
		2045	0.1	0.3	0.0
Offsite Trucks	Diesel/LNG	2014	4.2	2.4	0.4
		2023	3.7	2.8	0.0
		2030	4.0	3.0	0.0
		2036	4.0	3.0	0.0
		2045	4.1	3.0	0.0
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.0	0.0
		2023	0.0	0.1	0.0
		2030	0.0	0.1	0.0
		2036	0.0	0.1	0.0
		2045	0.0	0.1	0.0
Offsite PC	Diesel/Gas/Elec	2014	0.1	0.2	0.0
		2023	0.2	0.4	0.0
		2030	0.3	0.4	0.0
		2036	0.2	0.4	0.0
		2045	0.2	0.4	0.0
Rail Offsite	Diesel	2014	5.1		5.1
		2023	5.5		5.5
		2030	3.6		3.6
		2036	2.1		2.1
		2045	0.9		0.9
Rail Onsite	Diesel	2014	0.4		0.4
		2023	0.3		0.3
		2030	0.2		0.2
		2036	0.1		0.1
		2045	0.1		0.1
Grand Total			**67.8**	**35.1**	**40.2**

Table B1-495. FEIR Mitigated Scenario Peak Day Emissions by Source Category and Analysis Year in lbs/day

Source category											
Values	**Year**	**CHE**	**OGV**	**Harbor Craft**	**Onsite Trucks**	**Offsite Trucks**	**Onsite PC**	**Offsite PC**	**Rail Offsite**	**Rail Onsite**	**Grand Total**
Sum of NOx	2014	771.39	4,452.97	48.56	277.18	1,983.28	0.10	2.54	1,425.72	104.71	9,066.44
	2023	155.34	5,622.88	19.94	130.54	509.53	0.09	2.01	1,975.64	96.84	8,512.82
	2030	121.23	4,594.11	21.11	166.82	404.58	0.06	1.31	1,435.51	68.85	6,813.60
	2036	138.21	2,991.53	22.12	172.59	350.60	0.05	0.98	928.14	48.43	4,652.64
	2045	140.73	1,287.99	20.04	173.96	421.66	0.04	0.89	502.73	30.84	2,578.88
Sum of VOC	2014	244.51	218.44	4.56	14.39	43.62	0.06	0.78	62.53	4.69	593.58
	2023	119.61	193.20	2.47	4.78	15.91	0.04	0.42	70.78	3.60	410.81
	2030	59.82	371.96	2.74	5.74	19.59	0.03	0.26	49.44	2.50	512.08
	2036	121.76	371.96	2.98	5.82	21.17	0.02	0.18	31.45	1.76	557.09
	2045	130.95	371.96	2.48	5.82	26.57	0.02	0.16	18.42	1.23	557.61
Sum of CO	2014	4,055.11	273.90	26.95	53.98	143.11	1.31	27.09	321.03	25.16	4,927.63
	2023	548.89	340.30	49.57	93.27	287.89	1.30	24.52	550.34	27.88	1,923.97
	2030	477.85	716.36	53.22	62.52	221.31	0.95	18.25	576.34	27.69	2,154.50
	2036	599.09	716.36	56.35	51.38	205.75	0.73	14.37	544.81	27.40	2,216.26
	2045	619.96	716.36	50.02	47.86	254.56	0.64	13.07	501.45	27.40	2,231.31
Sum of PM25	2014	10.97	70.68	1.66	0.71	18.41	0.01	0.41	39.28	2.72	144.84
	2023	5.28	70.51	0.41	0.40	12.03	0.03	0.90	41.79	1.96	133.31
	2030	4.27	105.93	0.48	0.45	12.95	0.04	0.96	27.75	1.26	154.08
	2036	5.73	105.93	0.54	0.45	12.99	0.03	0.93	16.15	0.79	143.54
	2045	5.95	105.93	0.42	0.45	13.08	0.03	0.94	7.63	0.43	134.85
Sum of PM10	2014	11.05	77.17	1.80	1.20	35.24	0.03	0.97	42.13	2.91	172.50
	2023	5.74	76.32	0.45	0.95	29.82	0.08	2.18	44.84	2.10	162.47
	2030	4.64	114.70	0.52	1.07	32.42	0.08	2.34	29.22	1.32	186.31
	2036	6.23	114.70	0.59	1.07	32.64	0.08	2.29	16.61	0.81	175.02
	2045	6.46	114.70	0.45	1.07	32.81	0.08	2.32	7.64	0.43	165.97
Sum of PM10TW	2014				0.27	9.49	0.00	0.17			9.93
	2023				0.32	10.23	0.01	0.38			10.94
	2030				0.35	11.20	0.01	0.41			11.98
	2036				0.36	11.31	0.01	0.40			12.08
	2045				0.36	11.36	0.01	0.41			12.14
Sum of PM10BW	2014				0.47	16.28	0.02	0.76			17.53
	2023				0.55	17.55	0.06	1.72			19.88
	2030				0.61	19.21	0.06	1.87			21.76
	2036				0.61	19.40	0.06	1.85			21.92
	2045				0.61	19.48	0.06	1.88			22.03
Sum of SOx	2014	0.89	143.22	0.04	0.36	4.45	0.00	0.07	1.25	0.10	150.38
	2023	1.19	164.98	0.06	0.34	3.54	0.01	0.11	2.14	0.11	172.48
	2030	1.33	170.01	0.06	0.38	4.25	0.01	0.09	2.25	0.11	178.48
	2036	1.33	170.01	0.06	0.38	4.36	0.01	0.08	2.12	0.11	178.46
	2045	1.33	170.01	0.06	0.38	4.38	0.01	0.08	1.95	0.11	178.31
Sum of CO2	2014	202,106.61	273,158.61	3,484.09	45,446.51	449,348.41	374.43	6,615.63	123,882.15	9,657.47	1,114,073.90
	2023	286,622.33	248,313.50	6,004.67	50,585.30	489,629.59	685.15	10,975.59	212,345.16	10,716.45	1,315,877.73
	2030	319,709.92	255,881.61	6,004.67	50,037.60	484,362.21	587.16	9,365.13	222,377.46	10,647.02	1,358,972.78
	2036	319,906.81	255,881.61	6,004.67	48,116.52	473,804.27	524.87	8,364.30	210,214.91	10,539.86	1,333,357.84
	2045	319,706.67	255,881.61	6,004.67	47,281.27	483,590.14	510.47	8,360.37	193,479.44	10,538.51	1,325,353.17
Sum of CH4	2014	17.56	4.15	0.07	0.80	2.39	0.02	0.22	10.03	0.77	36.01
	2023	17.78	3.33	0.12	1.02	3.04	0.02	0.17	17.19	0.86	43.53
	2030	20.89	3.40	0.12	0.65	2.15	0.01	0.11	18.00	0.86	46.18
	2036	18.20	3.40	0.12	0.52	1.91	0.01	0.07	17.01	0.85	42.10
	2045	11.18	3.40	0.12	0.48	2.35	0.01	0.06	15.66	0.85	34.11
Sum of N2O	2014	0.00	17.43	0.16	2.59	16.67	0.00	0.11	3.26	0.25	40.47
	2023	0.00	15.96	0.27	2.82	20.72	0.00	0.09	5.59	0.28	45.74
	2030	0.00	14.24	0.27	2.89	18.45	0.00	0.07	5.85	0.28	42.05
	2036	0.00	14.24	0.27	2.82	17.27	0.00	0.05	5.53	0.28	40.45
	2045	0.00	14.24	0.27	2.78	16.82	0.00	0.05	5.09	0.28	39.53
Sum of DPM	2014	0.98	63.20	1.80	0.15	3.17	0.00	0.00	42.13	2.91	114.36
	2023	2.18	65.99	0.45	0.00	0.10	0.00	0.00	44.84	2.10	115.66
	2030	1.47	104.66	0.52	0.01	0.10	0.00	0.00	29.22	1.32	137.30
	2036	2.11	104.66	0.59	0.01	0.10	0.00	0.00	16.61	0.81	124.88
	2045	2.82	104.66	0.45	0.01	0.10	0.00	0.00	7.64	0.43	116.11

Table B1-496. Peak Day FEIR Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lb/day

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	1.0		1.0
		2023	2.2		2.2
		2030	1.5		1.5
		2036	2.1		2.1
		2045	2.8		2.8
	LPG	2014	10.1		0.0
	LNG	2023	3.6		0.0
		2030	3.2		0.0
		2036	4.1		0.0
		2045	3.6		0.0
OGV	MDO/MGO	2014	77.2		63.2
		2023	76.3		66.0
		2030	114.7		104.7
		2036	114.7		104.7
		2045	114.7		104.7
Harbor Craft	MDO/MGO	2014	1.8		1.8
		2023	0.4		0.4
		2030	0.5		0.5
		2036	0.6		0.6
		2045	0.5		0.5
Onsite Trucks	Diesel	2014	0.4	22.7	0.1
		2023	0.0	26.9	0.0
		2030	0.0	29.9	0.0
		2036	0.0	30.1	0.0
		2045	0.0	30.2	0.0
	95% LNG+5% Diesel	2014	0.8	2.0	0.0
		2023	1.0	2.4	0.0
		2030	1.1	2.7	0.0
		2036	1.1	2.7	0.0
		2045	1.1	2.7	0.0
Offsite Trucks	Diesel / LNG	2014	35.2	20.0	3.2
		2023	29.8	22.6	0.1
		2030	32.4	24.4	0.1
		2036	32.6	24.2	0.1
		2045	32.8	24.1	0.1
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.2	0.0
		2023	0.1	0.6	0.0
		2030	0.1	0.7	0.0
		2036	0.1	0.7	0.0
		2045	0.1	0.7	0.0
Offsite PC	Diesel/Gas/Elec	2014	1.0	1.7	0.0
		2023	2.2	3.4	0.0
		2030	2.3	3.8	0.0
		2036	2.3	3.8	0.0
		2045	2.3	3.9	0.0
Rail Offsite	Diesel	2014	42.1		42.1
		2023	44.8		44.8
		2030	29.2		29.2
		2036	16.6		16.6
		2045	7.6		7.6
Rail Onsite	Diesel	2014	2.9		2.9
		2023	2.1		2.1
		2030	1.3		1.3
		2036	0.8		0.8
		2045	0.4		0.4
Grand Total			**862.3**	**286.8**	**608.3**

Emissions Inventory with Proposed Mitigations

Table B1-497. Proposed Mitigated Scenario Peak hour Emissions by Source Category in lbs/hr

		Source category									
Values	**Year**	**CHE**	**OGV**	**Harbor Craft**	**Onsite Trucks**	**Offsite Trucks**	**Onsite PC**	**Offsite PC**	**Rail Offsite**	**Rail Onsite**	**Grand Total**
Sum of NOx	2014	98.43	566.40	7.71	19.52	139.64	0.01	0.18	59.40	4.36	895.65
	2023	7.99	93.87	0.00	9.62	37.54	0.01	0.13	82.32	4.04	235.52
	2030	10.40	151.51	2.36	12.29	29.81	0.00	0.09	59.81	2.87	269.15
	2036	9.95	86.39	2.47	12.72	25.83	0.00	0.06	38.67	2.02	178.11
	2045	9.79	50.60	2.24	12.82	31.07	0.00	0.06	20.95	1.29	128.80
Sum of VOC	2014	17.60	29.28	0.84	1.01	3.07	0.00	0.05	2.61	0.20	54.67
	2023	3.17	3.50	0.00	0.35	1.17	0.00	0.03	2.95	0.15	11.33
	2030	9.60	20.10	0.31	0.42	1.44	0.00	0.02	2.06	0.10	34.06
	2036	7.45	20.10	0.33	0.43	1.56	0.00	0.01	1.31	0.07	31.26
	2045	7.08	20.10	0.28	0.43	1.96	0.00	0.01	0.77	0.05	30.67
Sum of CO	2014	281.09	30.18	4.94	3.80	10.08	0.09	1.91	13.38	1.05	346.50
	2023	305.21	8.87	0.00	6.87	21.21	0.10	1.62	22.93	1.16	367.97
	2030	1,019.18	29.19	5.94	4.61	16.31	0.07	1.17	24.01	1.15	1,101.63
	2036	443.33	29.19	6.29	3.79	15.16	0.05	0.90	22.70	1.14	522.56
	2045	656.97	29.19	5.58	3.53	18.76	0.05	0.82	20.89	1.14	736.93
Sum of PM25	2014	1.21	7.27	0.25	0.05	1.30	0.00	0.03	1.64	0.11	11.86
	2023	0.27	2.25	0.00	0.03	0.89	0.00	0.06	1.74	0.08	5.33
	2030	0.43	4.78	0.05	0.03	0.95	0.00	0.06	1.16	0.05	7.53
	2036	0.39	4.78	0.06	0.03	0.96	0.00	0.06	0.67	0.03	6.99
	2045	0.38	4.78	0.05	0.03	0.96	0.00	0.06	0.32	0.02	6.60
Sum of PM10	2014	1.25	7.92	0.27	0.08	2.48	0.00	0.07	1.76	0.12	13.95
	2023	0.30	2.44	0.00	0.07	2.20	0.01	0.15	1.87	0.09	7.11
	2030	0.47	5.18	0.06	0.08	2.39	0.01	0.15	1.22	0.06	9.60
	2036	0.43	5.18	0.07	0.08	2.41	0.01	0.15	0.69	0.03	9.03
	2045	0.41	5.18	0.05	0.08	2.42	0.01	0.15	0.32	0.02	8.63
Sum of PM10TW	2014				0.02	0.67	0.00	0.01			0.70
	2023				0.02	0.75	0.00	0.03			0.80
	2030				0.03	0.83	0.00	0.03			0.88
	2036				0.03	0.83	0.00	0.03			0.89
	2045				0.03	0.84	0.00	0.03			0.89
Sum of PM10BW	2014				0.03	1.15	0.00	0.05			1.23
	2023				0.04	1.29	0.00	0.12			1.45
	2030				0.04	1.42	0.00	0.12			1.59
	2036				0.04	1.43	0.00	0.12			1.60
	2045				0.04	1.44	0.00	0.12			1.60
Sum of SOx	2014	0.08	14.35	0.01	0.03	0.31	0.00	0.00	0.05	0.00	14.84
	2023	0.09	5.65	0.00	0.03	0.26	0.00	0.01	0.09	0.00	6.14
	2030	0.10	6.87	0.01	0.03	0.31	0.00	0.01	0.09	0.00	7.43
	2036	0.10	6.87	0.01	0.03	0.32	0.00	0.01	0.09	0.00	7.43
	2045	0.10	6.87	0.01	0.03	0.32	0.00	0.01	0.08	0.00	7.42
Sum of CO2	2014	16,462.98	24,752.21	626.34	3,199.90	31,638.74	26.36	465.81	5,161.76	402.39	82,736.49
	2023	21,616.99	8,475.65	0.00	3,727.39	36,078.44	50.49	735.22	8,847.72	446.52	79,978.41
	2030	24,148.41	10,303.92	670.02	3,687.03	35,690.31	43.27	607.99	9,265.73	443.63	84,860.30
	2036	24,156.12	10,303.92	670.02	3,545.47	34,912.35	38.68	529.30	8,758.95	439.16	83,353.97
	2045	24,141.03	10,303.92	670.02	3,483.93	35,633.42	37.61	531.58	8,061.64	439.10	83,302.26
Sum of CH4	2014	1.74	0.56	0.01	0.06	0.17	0.00	0.02	0.42	0.03	3.00
	2023	0.77	0.07	0.00	0.07	0.22	0.00	0.01	0.72	0.04	1.90
	2030	1.88	0.10	0.01	0.05	0.16	0.00	0.01	0.75	0.04	2.99
	2036	1.13	0.10	0.01	0.04	0.14	0.00	0.00	0.71	0.04	2.17
	2045	0.87	0.10	0.01	0.04	0.17	0.00	0.00	0.65	0.04	1.88
Sum of N2O	2014	0.00	1.62	0.03	0.18	1.17	0.00	0.01	0.14	0.01	3.16
	2023	0.00	0.49	0.00	0.21	1.53	0.00	0.01	0.23	0.01	2.48
	2030	0.00	0.57	0.03	0.21	1.36	0.00	0.00	0.24	0.01	2.44
	2036	0.00	0.57	0.03	0.21	1.27	0.00	0.00	0.23	0.01	2.33
	2045	0.00	0.57	0.03	0.20	1.24	0.00	0.00	0.21	0.01	2.27
Sum of DPM	2014	0.54	7.21	0.27	0.03	0.61	0.00	0.00	1.76	0.12	10.54
	2023	0.11	1.92	0.00	0.01	0.14	0.00	0.00	1.87	0.09	4.13
	2030	0.18	4.68	0.06	0.01	0.14	0.00	0.00	1.22	0.06	6.33
	2036	0.21	4.68	0.07	0.01	0.13	0.00	0.00	0.69	0.03	5.81
	2045	0.17	4.68	0.05	0.01	0.13	0.00	0.00	0.32	0.02	5.37

Table B1-498. Peak Hour Proposed Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/hour

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	0.5		0.5
		2023	0.1		0.1
		2030	0.2		0.2
		2036	0.2		0.2
		2045	0.2		0.2
	LPG	2014	0.7		0.0
		2023	0.2		0.0
		2030	0.3		0.0
		2036	0.2		0.0
		2045	0.2		0.0
OGV	MDO/MGO	2014	7.9		7.2
		2023	2.4		1.9
		2030	5.2		4.7
		2036	5.2		4.7
		2045	5.2		4.7
Harbor Craft	MDO/MGO	2014	0.3		0.3
		2023	0.0		0.0
		2030	0.1		0.1
		2036	0.1		0.1
		2045	0.1		0.1
Onsite Trucks	Diesel	2014	0.1	1.6	0.0
		2023	0.1	2.0	0.0
		2030	0.1	2.2	0.0
		2036	0.1	2.2	0.0
		2045	0.1	2.2	0.0
	95% LNG+5% Diesel	2014	0.0	0.1	0.0
		2023	0.0	0.2	0.0
		2030	0.0	0.2	0.0
		2036	0.0	0.2	0.0
		2045	0.0	0.2	0.0
Offsite Trucks	Diesel / LNG	2014	2.5	1.4	0.6
		2023	2.2	1.7	0.1
		2030	2.4	1.8	0.1
		2036	2.4	1.8	0.1
		2045	2.4	1.8	0.1
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.0	0.0
		2023	0.0	0.0	0.0
		2030	0.0	0.0	0.0
		2036	0.0	0.0	0.0
		2045	0.0	0.0	0.0
Offsite PC	Diesel/Gas/Elec	2014	0.1	0.1	0.0
		2023	0.1	0.2	0.0
		2030	0.2	0.3	0.0
		2036	0.1	0.2	0.0
		2045	0.1	0.2	0.0
Rail Offsite	Diesel	2014	1.8		1.8
		2023	1.9		1.9
		2030	1.2		1.2
		2036	0.7		0.7
		2045	0.3		0.3
Rail Onsite	Diesel	2014	0.1		0.1
		2023	0.1		0.1
		2030	0.1		0.1
		2036	0.0		0.0
		2045	0.0		0.0
Grand Total			**48.3**	**20.9**	**32.2**

Table B1-499. Proposed Mitigated Scenario Peak 8-hour Emissions by Source Category and Analysis year in lbs/8-hours

		Source category									
Values	Year	CHE	OGV	Harbor Craft	Onsite Trucks	Offsite Trucks	Onsite PC	Offsite PC	Rail Offsite	Rail Onsite	Grand Total
Sum of NOx	2014	684.47	3,663.32	7.71	135.71	971.06	0.05	1.24	475.24	34.90	5,973.70
	2023	57.41	1,802.74	7.17	69.15	269.91	0.05	0.97	658.55	32.28	2,898.22
	2030	74.77	1,634.52	6.08	88.37	214.31	0.03	0.61	478.50	22.95	2,520.15
	2036	71.50	947.69	6.37	91.42	185.72	0.02	0.45	309.38	16.14	1,628.69
	2045	70.35	519.11	5.77	92.15	223.36	0.02	0.40	167.58	10.28	1,089.02
Sum of VOC	2014	122.38	181.09	0.84	7.05	21.36	0.03	0.38	20.84	1.56	355.54
	2023	22.80	54.67	0.89	2.53	8.43	0.02	0.20	23.59	1.20	114.34
	2030	69.05	161.06	0.79	3.04	10.38	0.01	0.12	16.48	0.83	261.77
	2036	53.54	161.06	0.86	3.08	11.21	0.01	0.08	10.48	0.59	240.92
	2045	50.87	161.06	0.72	3.08	14.07	0.01	0.07	6.14	0.41	236.44
Sum of CO	2014	1,954.65	209.65	4.94	26.43	70.07	0.64	13.26	107.01	8.39	2,395.04
	2023	2,194.13	85.54	17.83	49.41	152.50	0.69	11.64	183.45	9.29	2,704.48
	2030	7,326.78	293.64	15.33	33.12	117.23	0.50	8.39	192.11	9.23	7,996.34
	2036	3,187.10	293.64	16.23	27.22	108.99	0.39	6.46	181.60	9.13	3,830.76
	2045	4,722.89	293.64	14.40	25.35	134.85	0.34	5.91	167.15	9.13	5,373.67
Sum of PM25	2014	8.41	52.57	0.25	0.35	9.01	0.01	0.20	13.09	0.91	84.80
	2023	1.95	21.96	0.15	0.21	6.37	0.02	0.44	13.93	0.65	45.67
	2030	3.10	44.17	0.14	0.24	6.86	0.02	0.45	9.25	0.42	64.64
	2036	2.83	44.17	0.16	0.24	6.88	0.02	0.43	5.38	0.26	60.36
	2045	2.73	44.17	0.12	0.24	6.93	0.02	0.43	2.54	0.14	57.32
Sum of PM10	2014	8.71	57.25	0.27	0.59	17.25	0.02	0.48	14.04	0.97	99.58
	2023	2.12	23.76	0.16	0.51	15.80	0.04	1.05	14.95	0.70	59.08
	2030	3.37	47.83	0.15	0.57	17.17	0.04	1.10	9.74	0.44	80.41
	2036	3.07	47.83	0.17	0.57	17.29	0.04	1.05	5.54	0.27	75.83
	2045	2.97	47.83	0.13	0.57	17.38	0.04	1.07	2.55	0.14	72.67
Sum of PM10TW	2014				0.13	4.65	0.00	0.08			4.86
	2023				0.17	5.42	0.01	0.18			5.78
	2030				0.19	5.93	0.01	0.19			6.32
	2036				0.19	5.99	0.01	0.18			6.37
	2045				0.19	6.02	0.01	0.19			6.40
Sum of PM10BW	2014				0.23	7.97	0.01	0.37			8.58
	2023				0.29	9.30	0.03	0.83			10.45
	2030				0.32	10.18	0.03	0.88			11.41
	2036				0.32	10.28	0.03	0.85			11.48
	2045				0.32	10.32	0.03	0.86			11.54
Sum of SOx	2014	0.59	105.53	0.01	0.18	2.18	0.00	0.03	0.42	0.03	108.96
	2023	0.67	56.67	0.02	0.18	1.87	0.00	0.05	0.71	0.04	60.23
	2030	0.75	68.83	0.02	0.20	2.25	0.00	0.04	0.75	0.04	72.88
	2036	0.75	68.83	0.02	0.20	2.31	0.00	0.04	0.71	0.04	72.90
	2045	0.75	68.83	0.02	0.20	2.32	0.00	0.04	0.65	0.04	72.85
Sum of CO2	2014	114,481.23	184,121.12	626.34	22,251.65	220,011.29	183.33	3,239.16	41,294.05	3,219.16	589,427.33
	2023	155,402.80	85,196.35	2,160.02	26,795.87	259,364.96	362.93	5,285.45	70,781.72	3,572.15	608,922.27
	2030	173,600.99	103,487.14	1,729.30	26,505.75	256,574.74	311.03	4,370.77	74,125.82	3,549.01	644,254.55
	2036	173,656.35	103,487.14	1,729.30	25,488.13	250,982.03	278.03	3,805.10	70,071.64	3,513.29	633,011.00
	2045	173,547.89	103,487.14	1,729.30	25,045.68	256,165.77	270.41	3,821.49	64,493.15	3,512.84	632,073.66
Sum of CH4	2014	12.12	3.44	0.01	0.39	1.17	0.01	0.11	3.34	0.26	20.85
	2023	5.52	1.02	0.04	0.54	1.61	0.01	0.08	5.73	0.29	14.83
	2030	13.50	1.31	0.04	0.34	1.14	0.01	0.05	6.00	0.29	22.66
	2036	8.12	1.31	0.04	0.28	1.01	0.00	0.03	5.67	0.28	16.75
	2045	6.25	1.31	0.04	0.25	1.24	0.00	0.03	5.22	0.28	14.63
Sum of N2O	2014	0.00	11.24	0.03	1.27	8.16	0.00	0.05	1.09	0.08	21.92
	2023	0.00	5.60	0.10	1.50	10.98	0.00	0.04	1.86	0.09	20.17
	2030	0.00	5.68	0.08	1.53	9.78	0.00	0.03	1.95	0.09	19.15
	2036	0.00	5.68	0.08	1.49	9.15	0.00	0.02	1.84	0.09	18.36
	2045	0.00	5.68	0.08	1.47	8.91	0.00	0.02	1.70	0.09	17.96
Sum of DPM	2014	3.77	51.34	0.27	0.21	4.28	0.00	0.00	14.04	0.97	74.88
	2023	0.78	19.62	0.16	0.04	0.99	0.00	0.00	14.95	0.70	37.24
	2030	1.28	43.83	0.15	0.05	0.98	0.00	0.00	9.74	0.44	56.48
	2036	1.49	43.83	0.17	0.05	0.94	0.00	0.00	5.54	0.27	52.29
	2045	1.19	43.83	0.13	0.05	0.97	0.00	0.00	2.55	0.14	48.86

Table B1-500. Peak 8-hour Proposed Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/8-hours

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	**Diesel**	2014	3.8		3.8
		2023	0.8		0.8
		2030	1.3		1.3
		2036	1.5		1.5
		2045	1.2		1.2
	LPG	2014	4.9		0.0
		2023	1.3		0.0
		2030	2.1		0.0
		2036	1.6		0.0
		2045	1.8		0.0
OGV	**MDO/MGO**	2014	57.3		51.3
		2023	23.8		19.6
		2030	47.8		43.8
		2036	47.8		43.8
		2045	47.8		43.8
Harbor Craft	**MDO/MGO**	2014	0.3		0.3
		2023	0.2		0.2
		2030	0.1		0.1
		2036	0.2		0.2
		2045	0.1		0.1
Onsite Trucks	**Diesel**	2014	0.5	11.1	0.2
		2023	0.5	14.2	0.0
		2030	0.5	15.8	0.1
		2036	0.5	16.0	0.1
		2045	0.5	16.0	0.1
	95% LNG+5% Diesel	2014	0.0	1.0	0.0
		2023	0.0	1.3	0.0
		2030	0.0	1.4	0.0
		2036	0.0	1.4	0.0
		2045	0.0	1.4	0.0
Offsite Trucks	**Diesel / LNG**	2014	17.3	9.8	4.3
		2023	15.8	11.9	1.0
		2030	17.2	12.9	1.0
		2036	17.3	12.8	0.9
		2045	17.4	12.8	1.0
Onsite PC	**Diesel/Gas/Elec**	2014	0.0	0.1	0.0
		2023	0.0	0.3	0.0
		2030	0.0	0.4	0.0
		2036	0.0	0.4	0.0
		2045	0.0	0.4	0.0
Offsite PC	**Diesel/Gas/Elec**	2014	0.5	0.8	0.0
		2023	1.1	1.8	0.0
		2030	1.1	1.8	0.0
		2036	1.0	1.7	0.0
		2045	1.1	1.7	0.0
Rail Offsite	**Diesel**	2014	14.0		14.0
		2023	14.9		14.9
		2030	9.7		9.7
		2036	5.5		5.5
		2045	2.5		2.5
Rail Onsite	**Diesel**	2014	1.0		1.0
		2023	0.7		0.7
		2030	0.4		0.4
		2036	0.3		0.3
		2045	0.1		0.1
Grand Total			**387.6**	**149.2**	**269.8**

Table B1-501. Proposed Mitigated Scenario Annual Emissions by Source Category in tons/year

		Source category									
Values	**Year**	**CHE**	**OGV**	**Harbor Craft**	**Onsite Trucks**	**Offsite Trucks**	**Onsite PC**	**Offsite PC**	**Rail Offsite**	**Rail Onsite**	**Grand Total**
Sum of NOx	2014	168.10	198.83	2.06	33.33	238.49	0.01	0.31	171.44	12.59	825.17
	2023	13.38	293.55	0.93	16.12	62.92	0.01	0.23	243.95	11.96	643.04
	2030	17.43	236.19	0.99	20.60	49.96	0.01	0.14	177.25	8.50	511.07
	2036	16.67	153.50	1.04	21.31	43.29	0.01	0.10	114.60	5.98	356.50
	2045	16.40	67.48	0.94	21.48	52.07	0.00	0.09	62.08	3.81	224.35
Sum of VOC	2014	30.06	7.32	0.19	1.73	5.25	0.01	0.09	7.52	0.56	52.73
	2023	5.32	10.07	0.12	0.59	1.96	0.01	0.05	8.74	0.44	27.30
	2030	16.09	18.50	0.13	0.71	2.42	0.00	0.03	6.10	0.31	44.30
	2036	12.48	18.56	0.14	0.72	2.61	0.00	0.02	3.88	0.22	38.63
	2045	11.86	18.56	0.12	0.72	3.28	0.00	0.02	2.27	0.15	36.98
Sum of CO	2014	480.06	11.67	1.14	6.49	17.21	0.16	3.26	38.60	3.03	561.62
	2023	511.45	18.09	2.32	11.52	35.55	0.16	2.71	67.95	3.44	653.19
	2030	1,707.87	36.14	2.49	7.72	27.33	0.12	1.96	71.16	3.42	1,858.20
	2036	742.91	36.22	2.64	6.34	25.41	0.09	1.51	67.27	3.38	885.77
	2045	1,100.90	36.22	2.34	5.91	31.43	0.08	1.38	61.92	3.38	1,243.56
Sum of PM25	2014	2.07	3.04	0.07	0.09	2.21	0.00	0.05	4.72	0.33	12.58
	2023	0.46	3.80	0.02	0.05	1.49	0.00	0.10	5.16	0.24	11.31
	2030	0.72	5.42	0.02	0.06	1.60	0.00	0.10	3.43	0.16	11.51
	2036	0.66	5.43	0.03	0.06	1.60	0.00	0.10	1.99	0.10	9.97
	2045	0.64	5.43	0.02	0.06	1.61	0.00	0.10	0.94	0.05	8.86
Sum of PM10	2014	2.14	3.34	0.08	0.14	4.24	0.00	0.12	5.07	0.35	15.48
	2023	0.49	4.11	0.02	0.12	3.68	0.01	0.25	5.54	0.26	14.47
	2030	0.78	5.87	0.02	0.13	4.00	0.01	0.26	3.61	0.16	14.85
	2036	0.72	5.88	0.03	0.13	4.03	0.01	0.24	2.05	0.10	13.19
	2045	0.69	5.88	0.02	0.13	4.05	0.01	0.25	0.94	0.05	12.03
Sum of PM10TW	2014				0.03	1.14	0.00	0.02			1.19
	2023				0.04	1.26	0.00	0.04			1.35
	2030				0.04	1.38	0.00	0.04			1.47
	2036				0.04	1.40	0.00	0.04			1.49
	2045				0.04	1.40	0.00	0.04			1.49
Sum of PM10BW	2014				0.06	1.96	0.00	0.09			2.11
	2023				0.07	2.17	0.01	0.19			2.44
	2030				0.08	2.37	0.01	0.21			2.66
	2036				0.08	2.40	0.01	0.20			2.68
	2045				0.08	2.41	0.01	0.20			2.69
Sum of SOx	2014	0.15	7.52	0.00	0.04	0.53	0.00	0.01	0.15	0.01	8.42
	2023	0.16	8.91	0.00	0.04	0.44	0.00	0.01	0.26	0.01	9.84
	2030	0.18	9.04	0.00	0.05	0.52	0.00	0.01	0.28	0.01	10.09
	2036	0.18	9.05	0.00	0.05	0.54	0.00	0.01	0.26	0.01	10.10
	2045	0.18	9.05	0.00	0.05	0.54	0.00	0.01	0.24	0.01	10.08
Sum of CO2	2014	28,116.33	13,010.84	147.82	5,465.00	54,034.28	45.03	795.53	14,896.86	1,161.31	117,673.00
	2023	36,224.32	13,424.38	281.10	6,246.15	60,457.85	84.60	1,232.04	26,219.68	1,323.23	145,493.35
	2030	40,466.31	13,613.55	281.10	6,178.53	59,807.45	72.50	1,018.83	27,458.44	1,314.66	150,211.35
	2036	40,479.21	13,626.87	281.10	5,941.32	58,503.79	64.81	886.97	25,956.64	1,301.43	147,042.14
	2045	40,453.93	13,626.87	281.10	5,838.19	59,712.12	63.03	890.79	23,890.20	1,301.26	146,057.49
Sum of CH4	2014	2.98	0.15	0.00	0.10	0.29	0.00	0.03	1.21	0.09	4.84
	2023	1.29	0.18	0.01	0.13	0.38	0.00	0.02	2.12	0.11	4.22
	2030	3.15	0.18	0.01	0.08	0.27	0.00	0.01	2.22	0.11	6.02
	2036	1.89	0.18	0.01	0.06	0.24	0.00	0.01	2.10	0.10	4.59
	2045	1.46	0.18	0.01	0.06	0.29	0.00	0.01	1.93	0.10	4.04
Sum of N2O	2014	0.00	0.87	0.01	0.31	2.00	0.00	0.01	0.39	0.03	3.63
	2023	0.00	0.87	0.01	0.35	2.56	0.00	0.01	0.69	0.03	4.52
	2030	0.00	0.78	0.01	0.36	2.28	0.00	0.01	0.72	0.03	4.19
	2036	0.00	0.78	0.01	0.35	2.13	0.00	0.01	0.68	0.03	3.99
	2045	0.00	0.78	0.01	0.34	2.08	0.00	0.01	0.63	0.03	3.88
Sum of DPM	2014	0.92	2.48	0.08	0.05	1.05	0.00	0.00	5.07	0.35	10.00
	2023	0.18	3.50	0.02	0.01	0.23	0.00	0.00	5.54	0.26	9.74
	2030	0.30	5.27	0.02	0.01	0.23	0.00	0.00	3.61	0.16	9.60
	2036	0.35	5.28	0.03	0.01	0.22	0.00	0.00	2.05	0.10	8.04
	2045	0.28	5.28	0.02	0.01	0.23	0.00	0.00	0.94	0.05	6.81

Table B1-502. Annual Proposed Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in ton/year

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	0.9		0.9
		2023	0.2		0.2
		2030	0.3		0.3
		2036	0.3		0.3
		2045	0.3		0.3
	LPG	2014	1.2		0.0
		2023	0.3		0.0
		2030	0.5		0.0
		2036	0.4		0.0
		2045	0.4		0.0
OGV	MGO/MDO	2014	3.3		2.5
		2023	4.1		3.5
		2030	5.9		5.3
		2036	5.9		5.3
		2045	5.9		5.3
Harbor Craft	MGO/MDO	2014	0.1		0.1
		2023	0.0		0.0
		2030	0.0		0.0
		2036	0.0		0.0
		2045	0.0		0.0
Onsite Trucks	Diesel	2014	0.1	2.7	0.1
		2023	0.1	3.3	0.0
		2030	0.1	3.7	0.0
		2036	0.1	3.7	0.0
		2045	0.1	3.7	0.0
	95% LNG+5% Diesel	2014	0.0	0.2	0.0
		2023	0.0	0.3	0.0
		2030	0.0	0.3	0.0
		2036	0.0	0.3	0.0
		2045	0.0	0.3	0.0
Offsite Trucks	Diesel/LNG	2014	4.2	2.4	1.1
		2023	3.7	2.8	0.2
		2030	4.0	3.0	0.2
		2036	4.0	3.0	0.2
		2045	4.1	3.0	0.2
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.0	0.0
		2023	0.0	0.1	0.0
		2030	0.0	0.1	0.0
		2036	0.0	0.1	0.0
		2045	0.0	0.1	0.0
Offsite PC	Diesel/Gas/Elec	2014	0.1	0.2	0.0
		2023	0.2	0.4	0.0
		2030	0.3	0.4	0.0
		2036	0.2	0.4	0.0
		2045	0.2	0.4	0.0
Rail Offsite	Diesel	2014	5.1		5.1
		2023	5.5		5.5
		2030	3.6		3.6
		2036	2.1		2.1
		2045	0.9		0.9
Rail Onsite	Diesel	2014	0.4		0.4
		2023	0.3		0.3
		2030	0.2		0.2
		2036	0.1		0.1
		2045	0.1		0.1
Grand Total			**70.0**	**35.1**	**44.2**

Table B1-503. Proposed Mitigated Scenario Peak Day Emissions by Source Category in lb/day

		Source category									
Values	**Year**	**CHE**	**OGV**	**Harbor Craft**	**Onsite Trucks**	**Offsite Trucks**	**Onsite PC**	**Offsite PC**	**Rail Offsite**	**Rail Onsite**	**Grand Total**
Sum of NOx	2014	1,397.95	5,029.09	48.56	277.18	1,983.28	0.10	2.54	1,425.72	104.71	10,269.12
	2023	108.38	5,622.88	19.94	130.54	509.53	0.09	1.83	1,975.64	96.84	8,465.67
	2030	141.15	4,594.11	21.11	166.82	404.58	0.06	1.16	1,435.51	68.85	6,833.35
	2036	134.97	2,991.53	22.12	172.59	350.60	0.05	0.84	928.14	48.43	4,649.27
	2045	132.81	1,287.99	20.04	173.96	421.66	0.04	0.76	502.73	30.84	2,570.84
Sum of VOC	2014	249.95	241.55	4.56	14.39	43.62	0.06	0.78	62.53	4.69	622.13
	2023	43.05	193.20	2.47	4.78	15.91	0.04	0.38	70.78	3.60	334.20
	2030	130.34	371.96	2.74	5.74	19.59	0.03	0.23	49.44	2.50	582.58
	2036	101.08	371.96	2.98	5.82	21.17	0.02	0.16	31.45	1.76	536.38
	2045	96.03	371.96	2.48	5.82	26.57	0.02	0.14	18.42	1.23	522.67
Sum of CO	2014	3,992.15	334.25	26.95	53.98	143.11	1.31	27.09	321.03	25.16	4,925.02
	2023	4,142.09	340.30	49.57	93.27	287.89	1.30	21.97	550.34	27.88	5,514.61
	2030	13,831.50	716.36	53.22	62.52	221.31	0.95	15.84	576.34	27.69	15,505.74
	2036	6,016.61	716.36	56.35	51.38	205.75	0.73	12.19	544.81	27.40	7,631.60
	2045	8,915.89	716.36	50.02	47.86	254.56	0.64	11.15	501.45	27.40	10,525.32
Sum of PM25	2014	17.18	82.53	1.66	0.71	18.41	0.01	0.41	39.28	2.72	162.90
	2023	3.69	70.51	0.41	0.40	12.03	0.03	0.82	41.79	1.96	131.63
	2030	5.85	105.93	0.48	0.45	12.95	0.04	0.85	27.75	1.26	155.55
	2036	5.33	105.93	0.54	0.45	12.99	0.03	0.80	16.15	0.79	143.02
	2045	5.15	105.93	0.42	0.45	13.08	0.03	0.81	7.63	0.43	133.93
Sum of PM10	2014	17.79	90.34	1.80	1.20	35.24	0.03	0.97	42.13	2.91	192.42
	2023	4.01	76.32	0.45	0.95	29.82	0.08	1.98	44.84	2.10	160.55
	2030	6.35	114.70	0.52	1.07	32.42	0.08	2.07	29.22	1.32	187.76
	2036	5.80	114.70	0.59	1.07	32.64	0.08	1.98	16.61	0.81	174.29
	2045	5.60	114.70	0.45	1.07	32.81	0.08	2.01	7.64	0.43	164.79
Sum of PM10TW	2014				0.27	9.49	0.00	0.17			9.93
	2023				0.32	10.23	0.01	0.34			10.91
	2030				0.35	11.20	0.01	0.36			11.93
	2036				0.36	11.31	0.01	0.35			12.03
	2045				0.36	11.36	0.01	0.35			12.08
Sum of PM10BW	2014				0.47	16.28	0.02	0.76			17.53
	2023				0.55	17.55	0.06	1.57			19.73
	2030				0.61	19.21	0.06	1.66			21.54
	2036				0.61	19.40	0.06	1.60			21.67
	2045				0.61	19.48	0.06	1.63			21.78
Sum of SOx	2014	1.21	156.06	0.04	0.36	4.45	0.00	0.07	1.25	0.10	163.53
	2023	1.27	164.98	0.06	0.34	3.54	0.01	0.10	2.14	0.11	172.55
	2030	1.42	170.01	0.06	0.38	4.25	0.01	0.08	2.25	0.11	178.56
	2036	1.42	170.01	0.06	0.38	4.36	0.01	0.07	2.12	0.11	178.54
	2045	1.42	170.01	0.06	0.38	4.38	0.01	0.07	1.95	0.11	178.39
Sum of CO2	2014	233,815.08	310,793.00	3,484.09	45,446.51	449,348.41	374.43	6,615.63	123,882.15	9,657.47	1,183,416.76
	2023	293,369.66	248,313.50	6,004.67	50,585.30	489,629.59	685.15	9,977.88	212,345.16	10,716.45	1,321,627.35
	2030	327,724.22	255,881.61	6,004.67	50,037.60	484,362.21	587.16	8,251.15	222,377.46	10,647.02	1,365,873.10
	2036	327,828.74	255,881.61	6,004.67	48,116.52	473,804.27	524.87	7,183.27	210,214.91	10,539.86	1,340,098.73
	2045	327,623.98	255,881.61	6,004.67	47,281.27	483,590.14	510.47	7,214.22	193,479.44	10,538.51	1,332,124.32
Sum of CH4	2014	24.75	4.59	0.07	0.80	2.39	0.02	0.22	10.03	0.77	43.64
	2023	10.42	3.33	0.12	1.02	3.04	0.02	0.15	17.19	0.86	36.15
	2030	25.48	3.40	0.12	0.65	2.15	0.01	0.09	18.00	0.86	50.76
	2036	15.34	3.40	0.12	0.52	1.91	0.01	0.06	17.01	0.85	39.23
	2045	11.81	3.40	0.12	0.48	2.35	0.01	0.06	15.66	0.85	34.73
Sum of N2O	2014	0.00	19.02	0.16	2.59	16.67	0.00	0.11	3.26	0.25	42.06
	2023	0.00	15.96	0.27	2.82	20.72	0.00	0.08	5.59	0.28	45.74
	2030	0.00	14.24	0.27	2.89	18.45	0.00	0.06	5.85	0.28	42.05
	2036	0.00	14.24	0.27	2.82	17.27	0.00	0.04	5.53	0.28	40.45
	2045	0.00	14.24	0.27	2.78	16.82	0.00	0.04	5.09	0.28	39.52
Sum of DPM	2014	7.69	76.37	1.80	0.43	8.73	0.00	0.00	42.13	2.91	140.07
	2023	1.47	65.99	0.45	0.08	1.88	0.00	0.00	44.84	2.10	116.80
	2030	2.41	104.66	0.52	0.10	1.85	0.00	0.00	29.22	1.32	140.08
	2036	2.81	104.66	0.59	0.10	1.78	0.00	0.00	16.61	0.81	127.36
	2045	2.25	104.66	0.45	0.10	1.82	0.00	0.00	7.64	0.43	117.35

Table B1-504. Peak Day Proposed Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lb/day

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2014	7.7		7.7
		2023	1.5		1.5
		2030	2.4		2.4
		2036	2.8		2.8
		2045	2.3		2.3
	LPG	2014	10.1		0.0
		2023	2.5		0.0
		2030	3.9		0.0
		2036	3.0		0.0
		2045	3.3		0.0
OGV	MDO/MGO	2014	90.3		76.4
		2023	76.3		66.0
		2030	114.7		104.7
		2036	114.7		104.7
		2045	114.7		104.7
Harbor Craft	MDO/MGO	2014	1.8		1.8
		2023	0.4		0.4
		2030	0.5		0.5
		2036	0.6		0.6
		2045	0.5		0.5
Onsite Trucks	Diesel	2014	1.1	22.7	0.4
		2023	0.9	26.9	0.1
		2030	1.0	29.9	0.1
		2036	1.0	30.1	0.1
		2045	1.0	30.2	0.1
	95% LNG+5% Diesel	2014	0.1	2.0	0.0
		2023	0.1	2.4	0.0
		2030	0.1	2.7	0.0
		2036	0.1	2.7	0.0
		2045	0.1	2.7	0.0
Offsite Trucks	Diesel / LNG	2014	35.2	20.0	8.7
		2023	29.8	22.6	1.9
		2030	32.4	24.4	1.9
		2036	32.6	24.2	1.8
		2045	32.8	24.1	1.8
Onsite PC	Diesel/Gas/Elec	2014	0.0	0.2	0.0
		2023	0.1	0.6	0.0
		2030	0.1	0.7	0.0
		2036	0.1	0.7	0.0
		2045	0.1	0.7	0.0
Offsite PC	Diesel/Gas/Elec	2014	1.0	1.7	0.0
		2023	2.0	3.3	0.0
		2030	2.1	3.4	0.0
		2036	2.0	3.2	0.0
		2045	2.0	3.3	0.0
Rail Offsite	Diesel	2014	42.1		42.1
		2023	44.8		44.8
		2030	29.2		29.2
		2036	16.6		16.6
		2045	7.6		7.6
Rail Onsite	Diesel	2014	2.9		2.9
		2023	2.1		2.1
		2030	1.3		1.3
		2036	0.8		0.8
		2045	0.4		0.4
Grand Total			**879.8**	**285.3**	**641.7**