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BERTHS 97-109 [CHINA SHIPPING] CONTAINER TERMINAL PROJECT

Final Supplemental Environmental Impact Report (SEIR)

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Chapter 1
Introduction

1.1 Final Supplemental Environmental Impact Report Organization

This chapter presents background and introductory information for the Revised Project, the continued operation of the China Shipping (CS) Container Terminal, located in the Port of Los Angeles (Port), under new or revised mitigation measures. This chapter also describes the Revised Project and its purpose under CEQA, and presents the authorities of the Los Angeles Harbor Department (LAHD or Port), the Lead Agency preparing this Supplemental Environmental Impact Report (SEIR), the scope and content of the SEIR, and the public outreach for the Revised Project. Chapter 2, “Response to Comments”, presents information regarding the distribution of and comments on the Draft SEIR and Recirculated Draft SEIR, and responses of the lead agency. Chapter 3 presents changes made to the Recirculated Draft SEIR.

1.2 CEQA Review Process

CEQA was enacted by the California Legislature in 1970 and requires public agency decision makers to consider the environmental effects of their actions. When a state or local agency determines that a proposed project has the potential for significantly adverse environmental effects after mitigation, an EIR is required to be prepared. The purpose of an EIR is to identify potentially significant adverse effects of a proposed project on the environment, to identify alternatives to the proposed project, and to indicate the manner in which those significant effects can be mitigated or avoided.

In accordance with CEQA Guidelines §15121(a), the purpose of an EIR is to serve as an informational document that: “will inform public agency decision-makers and the public generally of the significant environmental effect of a project, identify possible ways to minimize the significant effects, and describe reasonable alternatives to the project.” The Revised Project requires discretionary approval from the LAHD and, therefore, it is subject to the requirements of CEQA.

The LAHD has prepared this SEIR to supplement and update the Berths 97-109 [China Shipping] Container Terminal Project Environmental Impact Statement/Environmental Impact Report (EIS/EIR) certified by the City of Los Angeles Board of Harbor Commissioners on December 18, 2008 (LAHD and USACE 2008). The 2008 EIS/EIR evaluated the environmental impacts of the construction and operation of the CS Container Terminal (the “Approved Project”) at Berths 97-109. Construction of the Approved Project was completed in 2013.

A Supplemental EIR, as its name implies, supplements an EIR that has already been certified for a project, to address project changes, changed circumstances, or new information that was not known, and could not have been known with the exercise of reasonable diligence at the time the prior document was certified. The purpose of a Supplemental EIR is to provide the additional information necessary to make the previously certified EIR adequate for the project as revised. Accordingly, the Supplemental EIR need only contain the information necessary to respond to the project changes, changed circumstances or new information that triggered the need for additional environmental review (CEQA Guidelines, Section 15163.) A Supplemental EIR does not "re-open" a previously certified EIR or reanalyze the environmental impacts of a project as a whole; the analysis is limited to whether the project changes result in new or substantially more severe significant impacts.

The Revised Project makes minor changes to the continued operation of the CS Container Terminal by modifying 10 mitigation measures and one lease measure that were originally adopted based on the 2008 EIS/EIR. This SEIR analyzes the impacts of these modifications to those mitigation measures, in light of conclusions of the certified 2008 EIS/EIR for the CS Container Terminal.

This Final SEIR has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) (Pub. Res. Code §21000 et seq.) and the State CEQA Guidelines (Cal. Code of Regs. Tit. 14, §15000 et seq.). This SEIR will be used: to inform decision-makers and the public about the environmental effects associated with operation of the Revised Project and to propose mitigation measures that would avoid or reduce the significant adverse environmental effects of the Revised Project.

1.2.1 Notice of Preparation and Scoping Process

1.2.1.1 Notice of Preparation

On September 18, 2015, the LAHD issued a Notice of Preparation (NOP) and Initial Study (IS) to inform responsible and trustee agencies, public agencies, and the public that the LAHD was preparing a Supplemental EIR for the Revised Project, pursuant to CEQA. The NOP/IS (State Clearinghouse Number 2003061153) was circulated for a 30-day comment period from September 18, 2015, to October 19, 2015, to neighboring jurisdictions, responsible agencies, other public agencies, and interested individuals in order to solicit input on the scope of the environmental analysis to be included in the EIR. The LAHD held a public scoping meeting on October 7, 2015. Two individuals commented at the public meeting and 20 letters commenting on the NOP/IS or supporting or opposing the Project were received during the public comment period. Table 1-3 in Section 1.6 of the Draft SEIR presents a summary of the key comments received during the public comment period on the NOP/IS.

1.2.1.2 Scope of Analysis

This SEIR has been prepared in conformance with CEQA, the State CEQA Guidelines, and Port of Los Angeles Guidelines for the Implementation of CEQA; it includes all of the sections required by CEQA. This SEIR relies on policies and guidelines of the City of Los Angeles, including the Port of Los Angeles.

The criteria for determining the significance of environmental impacts in this SEIR analysis are described in the section titled "Significance Criteria" (also referred to as the "threshold of significance") under each resource topic in Chapter 3 of the Recirculated Draft EIR. A "Threshold of Significance" is an identified "quantitative, qualitative or performance level of a particular environmental effect, non-compliance with which means the effect will normally be determined to be significant by the agency and compliance with which means the effect normally will be determined to be less than significant" (CEQA Guidelines §15064.7 (a)). Except as noted in particular sections of the document, the City of Los Angeles CEQA Thresholds Guide (City of Los Angeles, 2006) are used for purposes of this SEIR, although some criteria were adapted to the specific circumstances of this project.

The following issues have been determined to be potentially significant and, therefore, are evaluated in this SEIR:

- Air Quality
- Greenhouse Gases and Climate Change
- Transportation

In addition to the above, cumulative impacts are evaluated in the SEIR. No alternatives are considered in this SEIR because, as described in Section 1.7 of the Recirculated Draft SEIR, a supplemental EIR is not required to consider alternatives to a component of the project. Rather, the alternatives analysis in the 2008 EIS/EIR appropriately considered alternatives to the project as a whole. The proposed modifications to the mitigation measures in the Revised Project do not change the Approved Project as a whole and do not require that an alternative be developed that specifically addresses those particular modifications.

The scope of the document, methods of analyses, and conclusions represent the independent judgment of the LAHD. Staff members from the LAHD and consultants who helped prepare this EIR are identified in Chapter 6 of the Draft SEIR (List of Preparers and Contributors).

1.2.2 Draft SEIR and Public Review

The Draft SEIR was released for public review on June 14, 2017 for a 45-day comment period, which was extended by 60 days at the request of several interested parties. A public hearing was held on July 18, 2017, and the comment period ended on September 29, 2017. LAHD received oral and written comments on the Draft SEIR from 36 agencies, organizations, and individuals.

1.2.3 Recirculated Draft SEIR and Public Review

In response to comments received on the Draft SEIR circulated in 2017, the LAHD determined to add significant new information to the environmental review, requiring that the Draft SEIR be recirculated. In summary, the CEQA baseline year was changed from 2014 to 2008, some of the mitigation measures in the Revised Project were altered to incorporate new technology and to align their implementation dates with the date of the new lease amendment, and the project description was revised to include years between 2008 and 2019 as the "partial implementation period" when some of the mitigation measures were not fully complied with.

On September 28, 2018, the LAHD released the Recirculated Draft SEIR for a 45-day comment period ending November 13, 2018. Because the LAHD revised and recirculated only certain portions of the Draft SEIR, the Notice of Availability of the Recirculated Draft EIR advised reviewers when submitting comments to limit their comments to the Recirculated Draft SEIR only, consistent with CEQA Guidelines Section 15088.5(f)(2). One oral comment was received at the public hearing held on October 25, 2018, and nine written comments were received by the end of the public review period. The issues raised in the comments were taken into consideration, and a number of changes were made when preparing the Final SEIR.

1.2.4 Final SEIR and Certification

This Final SEIR has been provided to the public for review, comment, and participation in the planning process. This Final SEIR is being distributed to provide the basis for decision making by the CEQA lead agency, as described in Section 1.8 of the Draft SEIR, and other concerned agencies. Certification of the SEIR for the Revised Project must precede Project approval. Project approval requires that the Board review and consider the SEIR; adopt Findings of Fact on the significant environmental effects of the Revised Project and the feasibility of mitigation measures; adopt a Statement of Overriding Considerations; approve the Project analyzed in the EIR; and adopt a Mitigation Monitoring and Reporting Program (MMRP).

1.3 Existing Environmental Setting

1.3.1 Regional Setting

The Port of Los Angeles (POLA) is the leading seaport in North America in terms of shipping container volume and cargo value, generating more than 830,000 regional jobs (this equates to 1 in 9 jobs in the five-county area) and $35 billion in annual wages and tax revenues. Operating for more than a century, POLA has been a center for global trade, national cargo transportation and related industrial uses. Together with the Port of Long Beach, it handles up to 64% of all shipping on the West Coast, and about 35% of all shipping in the United States. In Fiscal Year (FY) 2014-2015, POLA handled more than 8.1 million TEUs (twenty-foot equivalent units, a standardized maritime industry measurement used when counting cargo containers of varying lengths) of cargo through its terminals.

LAHD operates the Port under the legal mandates of the Port of Los Angeles Tidelands Trust (Los Angeles City Charter, Article VI, Section 601) and the California Coastal Act (PRC Division 20, Section 30700 et seq.), which identify the Port and its facilities as a primary economic and coastal resource of the State of California and an essential element of the national maritime industry for the promotion of commerce, navigation, fisheries, and harbor operations. Activities should be water dependent, and LAHD must give highest priority to navigation, shipping, and necessary support and access facilities to accommodate the demands of foreign and domestic waterborne commerce. LAHD is chartered to develop and operate the Port to benefit maritime uses. It functions as a landlord by leasing Port properties to more than 300 tenants.

The United States and China are the two largest trading countries in the world, and the two countries exchange significant amounts of cargo annually. POLA, as the nation's leading seaport, is a critical hub for facilitating trade from Asia, and China in particular.

1.3.2 Overview of the CS Container Terminal

Among the LAHD's tenants is China Shipping, which leases premises at Berths 97-109 to operate a marine container terminal (the "CS Terminal"). The CS Terminal is operated by the West Basin Container Terminal Company under a lease agreement (Permit No. 999) between China Shipping (North America) Holding Co., Ltd. ("China Shipping") and LAHD. The premises assigned to China Shipping are located at 2050 John S. Gibson Boulevard, within an industrial area in the vicinity of the West Basin and Turning Basin in Los Angeles Harbor (Figure 1-1).

Figure 1-1. The Berths 97-109 (China Shipping) Container Terminal.

The CS Terminal was constructed in several phases between 2004 and 2013, began operation in 2005, and has operated more or less continuously since then. The terminal is described in more detail in Section 2.5.1 of the Recirculated DSEIR. Briefly, however, it consists of two berths, ten wharf cranes for ship loading, a container yard, and a gate complex. The terminal has access to an on-dock intermodal railyard (the West Basin Intermodal Container Transfer Facility [WBICTF]) in the adjacent Yang Ming Terminal.

The CS Terminal handles imported and exported cargo containers. In 2008 (the Recirculated DSEIR's baseline year for the analysis under CEQA) the terminal handled

387,004 twenty-foot-equivalent units (TEUs: twenty-foot equivalent units, a measure of containerized cargo capacity) of containerized cargo, or approximately 215,000 containers. The majority of imported containers left the terminal by truck, whether to transload destinations in the region for ultimate placement on eastbound trains, to near-dock and off-dock railyards, or to warehouses and distribution centers for consumption within the region. The remainder were placed directly onto trains at the WBICTF for transport out of the southern California region. Export containers (those leaving the terminal on ships) made the reverse moves in roughly the same proportions. In total, these activities involved approximately 319,000 truck one-way trips, 350 train trips to and from the WBICTF, and 26 vessel calls.

1.3.3 Project History and Previous Environmental Reviews

The full background of the CS Terminal is described in detail in sections 1.1.2 and 1.2.3 of the Recirculated DSEIR. In summary, the LAHD previously prepared and certified the West Basin Transportation Improvements Program EIR (LAHD, 1997) that assessed the proposed construction and operation of terminal and infrastructure improvements in the West Basin of the Port. The document programmatically analyzed the impacts of the development of three separate container terminals in the West Basin: the CS Terminal, the Yang Ming Terminal, and the TraPac Terminal.

In March 2001, based on the WBTIP EIR, the Port issued a permit to construct the CS Terminal in a three-phased project and entered into a lease for China Shipping to occupy the terminal. The lease (Permit No. 999) granted China Shipping nonexclusive use of 72.48 acres at Berths 100-102 for operation of a container terminal facility for a term of twenty-five years with three five-year options to extend, exercisable by China Shipping. LAHD would develop and construct the terminal, designed to optimize operations at Berths 97-109, for its tenant, China Shipping.

In 2001, opponents of the project filed suit in Los Angeles Superior Court alleging, among other things, that LAHD did not comply with CEQA in approving the construction of the CS Terminal Project. The lawsuit was settled in 2004 through an Amended Stipulated Judgement (ASJ) in which the LAHD committed to preparing a new, project-specific EIR, agreed to mitigation measures, and established a $50 million community impact fund. Accordingly, in 2008 the U.S. Army Corps of Engineers (USACE) and the LAHD released the Draft Environmental Impact Statement/Environmental Impact Report (LAHD and USACE, 2008) that evaluated the environmental impacts of the construction and operation of the Berths 97-109 (China Shipping) Container Terminal Project. The 2008 EIS/EIR included 52 mitigation measures to reduce the impacts of construction and operation of the CS Terminal. The City of Los Angeles Board of Harbor Commissioners certified the Draft EIS/EIR and approved the project on December 18, 2008 (the Approved Project).

The major elements of the original development analyzed in the 2008 EIS/EIR included: constructing a new wharf at Berth 102 and lengthening the wharf at Berth 100, with minor dredging to match the West Basin channel depth of -53 feet MLLW; the addition of 10 wharf cranes for vessel loading and unloading; installation of shore power (AMP) facilities at both berths; the expansion and development of 142 acres of terminal backlands; the construction of container terminal buildings, gate facilities and accessory structures; the construction of two new bridges over the Southwest Slip to connect the Berth 97-109 Container Terminal to the Berth 121-131 Marine Terminal; relocation of the Catalina Express Terminal; and the construction of road improvements in the vicinity. The new wharves would accommodate the largest vessels then envisioned (10,000 TEU capacity). Construction was largely completed by 2013 (two terminal buildings have yet to be constructed), and operations are ongoing.

The 2008 EIS/EIR assumed that at full capacity, in 2030, the CS Container Terminal would handle approximately 1,551,000 TEUs per year, which is roughly equivalent to 838,000 standard shipping containers per year. That throughput would require approximately 1,500,000 truck trips, 234 vessel calls, and 817 train trips per year. Those numbers were based on cargo forecasting performed in 2005. The document assumed that at full capacity approximately 83% of the containers would be moved in and out of the terminal by truck (including to and from regional intermodal railyards) and the rest would be moved by trains from the WBICTF.

On September 18, 2015, the LAHD issued a Notice of Preparation (NOP) to inform responsible and trustee agencies, public agencies, and the public that the LAHD was preparing a Draft Supplemental Environmental Impact Report (Draft SEIR) to supplement and update the 2008 EIS/EIR. The scope and purpose of a supplemental EIR are fully described in Section 1.1.4 of the Recirculated DSEIR. To summarize, a supplemental EIR is prepared to address project changes, changed circumstances, or new information that was not known, and could not have been known at the time the prior document was certified, and need only contain the information necessary to respond to those changes. The purpose of a supplemental EIR is to provide the additional information necessary to make the previously certified EIR adequate for the project as revised.

The new information that prompted the LAHD to prepare a supplemental EIR included 1) issues raised by China Shipping regarding the feasibility of some of the mitigation measures in the 2008 EIS/EIR; 2) changed traffic and roadway conditions that called into question the need for some of the transportation-related mitigation measures; and 3) the partial implementation of some of the mitigation measures. The details of the partial implementation of mitigation measures are presented in Section 2.5.1 of the Recirculated DSEIR. China Shipping did not sign an amendment to the lease that incorporated the mitigation measures related to operation of the CS Terminal, and as a result the Port was unable to ensure implementation of those measures. In subsequent negotiations, China Shipping raised a number of feasibility and economic issues related to mitigation measures aimed at reducing air pollution from ships, cargo-handling equipment, and trucks (see Section 1.2.4 of the Recirculated Draft SEIR).

Operations between 2005 and 2017 included implementation of ASJ requirements and most of the mitigation measures imposed in the 2008 EIS/EIR, but, as described in Table 1-1, some mitigation measures were incompletely implemented or not implemented at all beginning in 2008. Those mitigation measures included MM AQ-9 (AMP), MM AQ-10 (VSRP), MM AQ-15 (Yard Tractors), MM AQ-16 (Railyard CHE), MM AQ-17 (Berth 97-109 CHE), and MM AQ-20 (LNG Drayage Trucks).

Table 1-1. Summary of 2008 EIS/EIR mitigation and lease measures for the CS Container Terminal being re-evaluated in this SEIR.

2008 EIR/EIS Measure	Description	Status through 2017
MM AQ-9 Alternative Maritime Power	China Shipping ships calling at Berths 97-109 must use AMP in the following percentages while hoteling in the Port. Jan-Jun 2005: 60%; July 2005: 70%; Jan 2010: 90%; Jan 2011: 100%. Additionally, by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at a 100 percent compliance rate, with the exception of circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship.	Compliance (% of China Shipping operated vessel calls): 2008: 86% 2009: 78% 2010: 72% 2011: 66% 2012: 12% 2013: 30% 2014: 93% 2015: 92% 2016: 99% 2017: 96%
MM AQ-10 Vessel Speed Reduction Program	Starting in 2009, all ships calling at Berths 97-109 shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area.	Compliance (% of all call to Berths 97-109): 2008: 97% within 20 nm and 24% within 40 nm 2009: 99% within 20 nm and 20% within 40 nm 2010: 97% within 20 nm and 42% within 40 nm 2011: 99% within 20 nm and 41% within 40 nm 2012: 93% within 20 nm and 47% within 40 nm. 2013: 99% within 20 nm and 89% within 40 nm 2014: 99% within 20 nm and 96% within 40 nm 2015: 99% within 20nm and 98% within 40nm 2016: 100% within 20nm and 96% within 40nm 2017: 96% within 20 nm and 91% within 40 nm
MM AQ-15 Yard Tractors at Berth 97-109 Terminal	All yard tractors operated at the Berth 97-109 terminal shall run on alternative fuel (LPG) beginning September 30, 2004, until December 31, 2014 Beginning January 1 2015, all yard tractors operated at the Berths 97-109 terminal shall be the cleanest available NO_X alternative-fueled engine meeting 0.015 gm/hp-hr for PM (Tier 4 Final).	From 2004 through 2014, all yard tractors met requirement to run on LPG. As of December 31, 2017 all yard tractors are alternative-fueled LPG, but they do not meet Tier 4 Final standard requirements.
MM AQ-16 Yard Equipment at Berth 121-131 Rail Yard	By the end of 2012, all equipment less than 750 hp shall meet the USEPA Tier 4 on-road or Tier 4 non-road engine standards. By December 31, 2014, all diesel-powered equipment operated at the Berth 121-131 terminal rail yard that handles containers moving through the Berth 97-109 terminal shall meet USEPA Tier 4 non-road engine standards.	During 2012, not all equipment less than 750 hp that operates at the railyard met Tier 4. During 2014, not all equipment that operates at the railyard met Tier 4 as shown in MM AQ-17 below. As of the end of 2017, not all equipment that operates at the railyard met Tier 4 as shown in MM AQ-17 below.

2008 EIR/EIS Measure	Description	Status through 2017
MM AQ-17 Yard Equipment at Berth 97-109 Terminal	Starting September 30, 2004: All diesel-powered toppicks and sidepicks operated at the Berth 97-109 terminal shall run on emulsified diesel fuel plus a DOC (ASJ Requirement). Starting January 1, 2009, all RTGs shall be electric, all toppicks shall have the cleanest available NO_X alternative fueled engines meeting 0.015 gm/hp-hr for PM, and all equipment purchases other than yard tractors, RTGs, and toppicks shall be either (1) the cleanest available NO_X alternative-fueled engine meeting 0.015 gm/hp-hr for PM or (2) the cleanest available NO_X diesel-fueled engine meeting 0.015 gm/hp-hr for PM. If there are no engines available that meet 0.015 gm/hp-hr for PM, the new engines shall be the cleanest available (either fuel type) and will have the cleanest VDEC. By the end of 2012: all terminal equipment less than 750 hp other than yard tractors, RTGs, and toppicks shall meet USEPA Tier 4 on-road or off-road engine standards. By the end of 2014: all terminal equipment other than yard tractors, RTGs, and toppicks shall meet USEPA Tier 4 non-road engine standards. In addition to the above requirements, the tenant at Berth 97-109 shall participate in a 1-year electric yard tractor [truck] pilot project. As part of the pilot project, two electric tractors will be deployed at the terminal within 1 year of lease approval. If the pilot project is successful in terms of operation, costs and availability, the tenant shall replace half of the Berth 97-109 yard tractors with electric tractors within 5 years of the feasibility determination.	During 2008, toppicks and side-picks had DOCs and run on emulsified fuel, meeting the requirement for 2008. As of the end of 2014, none of the RTGs were electric (one is hybrid diesel-electric and the others are diesel), none of the toppicks were alternative-fueled; and only four met the 0.015 gm/hp-hr PM standard, and none of the other equipment covered by MM AQ-17 met Tier 4. As of the end of 2017, none of the RTGs are electric (six are hybrid diesel-electric and the rest are diesel), none of the toppicks are alternative-fueled; and not all of the equipment covered by MM AQ-17 meets Tier 4 standards. The 1-year electric yard tractor [truck] pilot project was not implemented.
MM AQ-20 LNG Trucks	Heavy-duty trucks entering the Berth 97-109 Terminal shall be LNG fueled in the following percentages: 50% in 2012 and 2013, 70% 2014 through 2017, 100% in 2018 and thereafter.	In 2012, 10% of truck calls at WBCT (including the CS terminal) were made by LNG trucks. In 2014, 6% of truck calls at WBCT (including the CS terminal) were made by LNG trucks, which is lower than the port-wide average of 10%.
LM AQ-23 Throughput Tracking	If the Project exceeds project throughput assumptions/projections anticipated through the years 2010, 2015, 2030, or 2045, staff shall evaluate the effects of this on the emissions sources (ship calls, locomotive activity, backland development, and truck calls) relative to the EIS/EIR. If it is determined that these emission sources exceed EIS/EIR assumptions, staff would evaluate actual air emissions for comparison with the EIS/EIR and if the criteria pollutant emissions exceed those in the EIS/EIR the new or additional mitigations	LAHD Wharfingers throughput data was reported as 690,597 TEUs in 2010 and 1,074,788 TEUs in 2015. Actual TEU throughput slightly exceeded the 2008 EIR projection of 605,200 TEUs for 2010 but did not exceed the projection of 1,164,400 TEUs for 2015.

2008 EIR/EIS Measure	Description	Status through 2017
	would be applied through MM AQ-22 Periodic Review of New Technology Regulations.	
MM TRANS-2 Alameda and Anaheim Streets	Provide an additional eastbound through-lane on Anaheim Street. This measure shall be implemented by 2015.	Not implemented.
MM TRANS-3 John S. Gibson Boulevard and I-110 NB Ramps	Provide an additional southbound and westbound right-turn lane on John S. Gibson Boulevard and I-110 NB ramps. Reconfigure the eastbound approach to one eastbound through-left-turn lane, and one eastbound through-right-turn lane. Provide an additional westbound right-turn lane with westbound right-turn overlap phasing. This measure shall be implemented by 2015.	Most of the requirement is being met through the completion of the John S. Gibson Blvd/I-110 Access Ramps and SR-47/I-110 Connector Improvements Project except to provide an additional westbound right-turn lane with westbound right-turn overlap phasing by 2015.
MM TRANS-4 Fries Avenue and Harry Bridges Boulevard	Provide an additional westbound through-lane on Harry Bridges Boulevard. Provide an additional northbound, eastbound, and westbound right-turn lane on Fries Avenue and Harry Bridges Boulevard. This measure shall be implemented by 2015.	Not implemented.
MM TRANS-6 Navy Way and Seaside Avenue	Provide an additional eastbound through-lane on Seaside Avenue. Reconfigure Modify Navy Way/Seaside Ave	Not implemented.

The Draft SEIR and the Recirculated Draft SEIR evaluated the continued operation of the CS Terminal under new and/or modified mitigation measures and also analyzed the impacts of the increased future throughput of the CS Terminal compared to the projections in the 2008 EIS/EIR. These changes are collectively referred to as the "Revised Project." The term "Revised Project" is used throughout the SEIR to encompass the broadest set of modifications to the Approved Project, the details of which are described in Section 2.5 of the Draft SEIR.

USACE was the federal lead agency for the Approved Project under the National Environmental Policy Act (NEPA) (U.S. Code [USC Title 42, Section 4341 et seq.) and in conformance with the Council for Environmental Quality (CEQ) Guidelines. However, because the Revised Project does not include any elements requiring federal action, including approvals, a NEPA document is not required and was not prepared.

1.4 Revised Project

This section describes the Revised Project, including its objectives and its key elements.

1.4.1 Revised Project Overview

Most of the mitigation measures in the 2008 EIS/EIR have either been completed or will be completed within the time period for implementation; in addition, all of the requirements of the ASJ have been met. Accordingly, those measures and the ASJ requirements are outside of the scope of the Revised Project and are not considered in this SEIR.

Of the 52 measures adopted in the 2008 EIS/EIR, 10 mitigation measures and one lease measure have not yet been fully implemented (Table 1-1). A re-evaluation of those measures, based on the feasibility of some of the measures, the subsequent availability of alternative technologies, and the actual need, has indicated that some may be unnecessary, others have been superseded by advances in technology, and still others need to be either modified to ensure their feasibility.

LAHD has proposed certain changes to the operational mitigation measures in Table 1-1 as the Revised Project, and the impacts of those potential changes to the CS Container Terminal's operations are analyzed and disclosed in this SEIR. For the Revised Project, some of the mitigation measures in Table 2-1 would be eliminated or modified, as described in Section 1.4.3, below. Some of these modifications differ from the measures described in the 2017 Draft SEIR in order to incorporate more recent technological developments, changes in technical analysis methodology, points raised in public comments received on the 2017 Draft SEIR, and the passage of time since the Draft SEIR was prepared.

The SEIR analyzes the impacts of the Revised Project under the assumption that throughput at the CS Container Terminal will be incrementally higher than was assumed in the 2008 EIS/EIR, consistent with LAHD's re-assessment of terminal capacity. The SEIR examines whether the proposed modifications to mitigation measures can be further revised, or if there are any additional feasible mitigation measures that could be adopted, to address such impacts. If the proposed modifications to the mitigation measures, other changes to the mitigation measures, or entirely new mitigation measures are recommended as a result of the SEIR, the Board of Harbor Commissioners will consider amending Permit No. 999 for operations at Berths 97-109 accordingly.

1.4.2 Proposed Project Objectives

In the 2008 EIS/EIR, the LAHD's overall objectives for the CS Container Terminal were threefold: (1) provide a portion of the facilities needed to accommodate the projected growth in the volume of containerized cargo through the Port; (2) comply with the Mayor's goal for the Port to increase growth while mitigating the impacts of that growth on the local communities and the Los Angeles region by implementing pollution control measures, including the elements of the Clean Air Action Plan (CAAP) applicable to the proposed Project; and (3) comply with the Port Strategic Plan to maximize the efficiency and capacity of terminals while raising environmental standards through application of all feasible mitigation measures.

The overall purpose of the Revised Project is to further the second and third objectives by eliminating some previously adopted measures that have proved to be infeasible or unnecessary; instituting new, feasible, mitigation measures; and modifying other existing measures to enhance their effectiveness.

1.4.3 Revised Project Elements

1.4.3.1 Proposed Modifications to 2008 EIR Mitigation Measures and Lease Measures

MM AQ-9 – Alternative Maritime Power (AMP)

MM AQ-9 (LAHD and USACE, 2008) required that China Shipping ships calling at Berths 97-109 must use AMP in the following percentages while hoteling in the Port: January 1 –June 30 2005: 60% of total ship calls; 1 July 2005: 70% of total ship calls (ASJ requirement); 1 January 2010: 90% of ship calls; 1 January 2011 and thereafter: 100% of ship calls. Additionally, by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at a 100 percent compliance rate, with the exception of circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship.

Several factors affect the ability of a container terminal to achieve the goal of having 100% of vessel calls use shore power. These factors, recognized by CARB, are the reason why CARB's shore power requirement is 50% of calls until 2017 and is capped at 80 percent of vessel calls by 2020. First, very few terminals service only the vessels of a single shipping line; most, including the CS Terminal, have a core business of vessels belonging to one shipping company or those of a consortium ("alliance") of a few shipping companies, but also accept third-party business. The core line of the CS Terminal, for example, is China Shipping, but the terminal accepts a number of third-party vessels, including Yang Ming and alliance members UASC and CMA-CGM. This business is important to international commerce and to the financial viability of individual terminals. This third-party business may involve vessels that have not been equipped to use shore power. Accordingly, some proportion of vessel calls cannot use AMP because the vessels are not equipped to do so.

Second, situations arise that prevent an AMP-capable vessel from utilizing AMP. These include emergency situations, as defined in 17 CCR Section 93118.3(c)14, involving either the vessel or the electric utility, and equipment failure involving the vessel, the AMP facility at the berth, or the electric utility.

Finally, a small percentage of the vessels that call at a given container terminal are operated by shipping lines that do not meet the CARB required minimum of 25 annual calls (CARB, 2007a, b); those vessels tend not to be outfitted to connect to shore power. For these vessels, alternative emissions control technology is the only possible option.

Although the goal of the Approved Project was 100 percent compliance for China Shipping vessels, the LAHD (as well as CARB) recognizes that the factors summarized above may prevent China Shipping from always achieving that goal. The Revised Project requires that:

> Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, all ships calling at Berths 97-109 must use AMP while hoteling in the Port, with a 95 percent compliance rate. Exceptions may be made if one of the following circumstances or conditions exists:
>
> 1) Emergencies
> 2) An AMP-capable berth is unavailable

3) An AMP-capable ship is not able to plug in
4) The vessel is not AMP-capable.

In the event one of these circumstances or conditions exist, an equivalent alternative at-berth emission control capture system shall be deployed, if feasible, based on availability, scheduling, operational feasibility, and contracting requirements between the provider of the equivalent alternative technology and the terminal operator. The equivalent alternative technology must, at a minimum, meet the emissions reductions that would be achieved from AMP.

For analysis purposes, compliance with this mitigation measure is assumed not to exceed 95%, in order to accommodate the exceptional circumstances in 1-4, above. The revised measure is consistent with the 2017 CAAP, as described above, and AMP requirements in recently certified EIRs.

MM AQ-10 – Vessel Speed Reduction Program

MM AQ-10 (LAHD and USACE, 2008) required that as of 2009, 100% of oceangoing vessels calling the CS Container Terminal comply with the Vessel Speed Reduction Program (VSRP) within a 40-nautical-mile (nm) radius of Point Fermin. The VSRP was initially (2005) established as a 20-nm-radius, but MM AQ-10 extended the radius to 40 nautical miles.

From 2008 through 2014 vessels calling the CS Container Terminal had very high compliance rates (93-99%) within the 20-mile zone but much lower rates in the 40-mile zone. Compliance in the 40-mile zone was particularly low in 2008 – 2012 (from 20% in 2009 to 47% in 2012) but rose to 89% in 2013 and 96% in 2014. While the high rates of compliance in 2014 were consistent with the other container terminals in the Port, they fell somewhat short of the 100% required by the mitigation measure.

The need to slow down vessels within the VSRP 40 nm radius is built in to the voyage plans of most shipping lines. Vessels calling the Port's major container terminals typically achieve high rates of compliance, some maintaining 100% compliance in the inner portion of the VSRP radius (20 nm) and several, including China Shipping, achieving or approaching 100% throughout the entire VSRP.

Although the compliance rate of vessels calling the CS Terminal has approached 100% in many years, not all vessels will be able to comply with VSRP requirements due to unavoidable practical need to increase speed for various reasons. Non-compliance with the VSRP is typically the result of pressure on vessel schedules caused by weather, port delays, and mechanical problems. In addition, meeting scheduled time slots for shorter voyages (e.g., to or from Oakland) may require higher vessel speeds: if, despite operating at higher than economic speeds outside the VSRP area, a vessel is still behind schedule as it approaches Los Angeles Harbor, it may have to continue at a higher speed in some part of the VSRP control radius. For example, operating at 17 knots instead of 12 knots would allow a vessel to make up an hour of time in the 40-mile zone. In addition, vessel schedules are coordinated to avoid incurring container terminal labor standby costs, so that increased speed may be necessary to arrive at a berth in time to utilize labor efficiently. Accordingly, while 100% compliance may be achieved in any given year, that rate cannot be sustained over a period of years.

For MM AQ-10, the Revised Project requires that:

> Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area.

Note that the Revised Project's MM AQ-10 analyzed in the Draft SEIR and the Recirculated Draft SEIR included a provision that the tenant could submit an alternative compliance plan that achieved equal or greater emissions reductions. However, in response to comments on the Recirculated Draft SEIR the LAHD modified MM AQ-10 to eliminate that provision.

The 95% requirement at 40 nm is consistent with recent POLA EIRs and with how shipping lines at terminals have been performing at POLA. It incorporates the realities of oceangoing cargo vessel operation and the need to maintain economic competitiveness. Furthermore, the actual effect on air quality and public health of requiring 95% rather than 100% would be negligible given the relatively small contribution of at-sea vessel emissions on health risk and the already-high level of compliance with the 12-knot requirement.

MM AQ-15 –Yard Tractors

MM AQ-15 (LAHD and USACE, 2008) required all yard tractors to run on alternative fuel (LPG) between September 30, 2004, and December 31, 2014, and that beginning January 1, 2015, all yard tractors must be the cleanest available NO_x alternative-fueled engine meeting 0.015 gm/hp-hr for PM.

As of the end of 2014, all yard tractors operating at the CS Container Terminal were alternative fuel-powered, and thus complied with the provision of MM AQ-15 requiring alternative-fuel power.

In light of changes in engine technology since the 2008 EIS/EIR was prepared, the 2017 Draft SEIR proposed that MM AQ-15 be revised to require yard tractors to meet Tier 4 standards for all criteria pollutants. Subsequent developments, however, have indicated that new engines can meet an ultra-low NO_X standard; accordingly, the measure was further revised in the Recirculated Draft EIR to incorporate that standard.

Revised Project Modification

For the Revised Project, MM AQ-15 requires that:

- No later than one year after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2007 or older shall be replaced with alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants.
- No later than five years after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2011 or older shall be replaced with alternative fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road engine emission rates for other criteria pollutants.

The revised mitigation measure takes into account the uncertainty in the timing of the measure given the time needed to certify the SEIR and execute a new lease amendment.

The measure will ensure that the CS Terminal will transition to the current cleanest available yard tractor technology within five years of the new lease amendment. For the longer term, however, the 2017 CAAP envisions that by 2030 the Port will rely on zero- and near-zero-emissions technologies for all cargo-handling equipment, consistent with CARB's March, 2017, initiative to amend the cargo-handling regulation to achieve up to 100% zero-emissions by 2030. In order to meet that goal, current yard tractors will need to be replaced by zero-emissions (i.e., electric-powered) tractors over the next ten years. At the time of publication of this SEIR, as discussed in the 2017 CAAP, zero-emissions tractors have not been demonstrated to be operationally feasible in a container terminal setting, but through the 2017 CAAP the Port has committed to an aggressive program of testing electric yard tractors at terminals.

The 2017 CAAP also obligates the Port and the terminal operators, including WBCT (the operator of the CS Terminal), to a firm process of evaluating terminal equipment and developing a ten-year procurement schedule for new cargo-handling equipment; the terminals are required to submit their schedules by January 1, 2019 and to update the schedules annually. By working with the terminals through their procurement schedules, grant funding, and lease terms, and taking into account the results of periodic feasibility assessments, the Port will ensure that terminal operators purchase the cleanest available equipment, emphasizing zero- and near-zero-emissions equipment. For the Revised Project, LM AQ-1 (see Section 1.4.3.2) requires the CS Terminal to participate in the CAAP's equipment procurement process.

MM AQ-16 – Railyard Cargo-Handling Equipment

In accordance with the ASJ, MM AQ-16 required that the CHE at the WBICTF on-dock railyard be exclusively LPG-fueled from 2004 to 2014. The measure further required that by end of 2014, all such equipment meet Tier 4 off-road or on-road engine standards. The equipment used at the railyard is the same CHE used in the container yards of the CS and YM terminals, i.e., yard tractors that transfer containers between the container yard and the railyard, and toppicks that load and unload trains and trucks. Accordingly, the intent of this measure is fulfilled by controlling yard tractors and CHE through MM AQ-15 and MM AQ-17.

Revised Project Modification

MM AQ-16 has been combined with MM AQ-17 because there is no feasible way to identify railyard, as opposed to container yard, equipment, and because implementation of AQ-15 and AQ-17 will control emissions associated with CHE handling CS cargo.

MM AQ-17 – Cargo Handling Equipment

In accordance with the ASJ, MM AQ-17 required that by September 30, 2004 all toppicks be equipped with diesel oxidation catalysts (DOCs) and use emulsified diesel fuel. MM AQ-17 further required that, beginning in 2009, all RTGs must be electric powered, all toppicks must have cleanest available NO_x alternative fuel engine meeting EPA Tier 4 standards for PM, and new equipment purchases must be either cleanest alternative fuel or cleanest diesel with cleanest verified control equipment; by the end of 2012, all equipment less than 750 hp (which includes all CHE at the CS terminal) must meet EPA Tier 4 off-road or on-road engine standards; and by the end of 2014, all equipment must meet Tier 4 non-road engine standards.

By 2004, all of the forklifts and top handlers met the ASJ requirements for emulsified diesel and DOCs. Since the further provisions of MM AQ-17 were not in effect until 2009, the CHE working at the CS Terminal in 2008 complied with the measure's requirements. The requirements for all-electric RTGs and cleanest-available top-picks in 2009 were not met. The implementation dates for the conversion of all other CHE to Tier 4 non-road standards were also not met.

All-electric RTGs are not only much more expensive to purchase than either diesel-powered or hybrid units, but their installation at a container terminal requires substantial and costly modifications of the container yard to accommodate the necessary power trenches and transformers. In addition, space constraints in much of the container yard prevent the installation of electric RTGs throughout the terminal; in most of the container yard the RTGs operate on short rows of containers which precludes the efficient deployment of electric RTGs because the electrical infrastructure does not permit electric RTGs to operate on multiple rows.

As described in Section 1.2.4.2 of the Recirculated Draft SEIR, China Shipping informed the Port that replacing the top-picks and side-picks with Tier 4 non-road standard compliant units would be prohibitively expensive and require the retirement of units with useful life remaining. The same economic constraints would apply to other cargo-handling equipment such as forklifts.

To achieve the objectives of the 2017 CAAP and of the original 2008 EIS/EIR, existing equipment must be replaced by equipment that meets more stringent emissions standards, including zero- and near-zero emission units as feasible. In the case of RTGs, WBCT confirmed that four electric RTGs could be deployed in what is known as the “surcharge area” at the terminal because this area has the necessary infrastructure. The surcharge area is a block area in the northern portion of the terminal that lies south of the waterway and bridges connecting to the adjacent YM Terminal. In the remainder of the terminal, the all-diesel RTGs could be replaced by diesel-electric hybrids. In fact, six of WBCT’s RTGs in 2016 were diesel-electric hybrid models. These hybrids, called EcoCranes, provide significant emission reductions compared to diesel RTGs (74% PM and 84% NO_x reduction).

With regard to the other CHE, engines meeting EPA Tier 4 off-road standards are available for heavy-duty forklifts and toppicks. Accordingly, the 2017 Draft SEIR revised MM AQ-17 to require replacement of existing toppicks and heavy-duty forklifts with units meeting Tier 4 standards, the replacement of lighter-duty forklifts with electric units, and the replacement of sweepers with cleanest-available units, and the replacement of shuttle buses with zero-emissions units by 2025. The replacement schedule for CHE incorporated the useful economic service life of the existing equipment and the high capital costs (e.g., $650,000 per unit for toppicks; LAHD, 2016) but accelerated the replacement. The Recirculated Draft SEIR further revises the measure to replace the calendar day compliance dates with dates related to the execution of a new lease amendment.

Revised Project Modification

For the Revised Project, MM AQ-17 is revised as follows: All yard equipment at the terminal except yard tractors shall implement the following requirements:

<u>Forklifts</u>:

- By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2004 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

- By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2005 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 5-ton forklifts of model years 2011 or older shall be replaced with zero-emission units.
- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

<u>Toppicks</u>:

- By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2006 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2014 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.

<u>Rubber-Tired Gantries</u>:

- By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2003 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2004 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine emission rates for PM and NOx.
- By seven years after the effective date of a new lease amendment between the Tenant and the LAHD, four RTG cranes of model years 2005 and older shall be replaced with all-electric units, and one diesel RTG crane of model year 2005 shall be replaced with a diesel-electric hybrid unit with a diesel engine that meets or is lower than Tier 4 final off-road engine emission rates for PM and NOx.

<u>Sweepers:</u>

- Sweeper(s) shall be alternative fuel or the cleanest available by six years after the effective date of a new lease amendment between the Tenant and the LAHD.

<u>Shuttle Buses:</u>

- Gasoline shuttle buses shall be zero-emission units by seven years after the effective date of a new lease amendment between the Tenant and the LAHD.

The revised mitigation measure takes into account the uncertainty in the timing of the measure given the time needed to certify the SEIR and execute a new lease amendment.

The phase-in schedules for the various equipment types take into account the economics of the useful life of the existing equipment and the realities of acquiring large numbers of new equipment.

The revised measure will ensure that the CS Terminal will transition to the then-current cleanest available technology for most major cargo-handling equipment within five years of the new lease amendment. For the longer term, however, the 2017 CAAP envisions that by 2030 the Port will rely on zero- and near-zero-emissions technologies for all cargo-handling equipment, consistent with CARB's March, 2017, initiative to amend the cargo-handling regulation to achieve up to 100% zero-emissions by 2030. In order to meet that goal, current equipment will need to be replaced by zero-emissions (i.e., electric-powered) equipment over the next ten years. At the time of publication of this SEIR, zero-emissions toppicks and heavy-duty forklifts have not been demonstrated to be operationally feasible in a container terminal setting, but through the 2017 CAAP the Port has committed to an aggressive program of testing such equipment at terminals. Electric mobile gantry cranes (rubber-tired and rail-mounted) are commercially available, but because they require substantial supporting infrastructure their deployment is more involved than for forklifts and toppicks. Nevertheless, some are already in use in the Port, and the 2017 CAAP commits the Ports to increasing the deployment of all-electric cranes.

The 2017 CAAP also obligates the Port and the terminal operators, including WBCT (the operator of the CS Terminal), to a firm process of evaluating terminal equipment and developing a ten-year procurement schedule for new cargo-handling equipment; the terminals are required to submit their schedules by January 1, 2019 and to update the schedules annually. By working with the terminals through their procurement schedules, grant funding, and lease terms, and taking into account the results of periodic feasibility assessments, the Port will ensure that terminal operators purchase the cleanest available equipment, emphasizing zero- and near-zero-emissions equipment. For the Revised Project, LM AQ-1 (see Section 1.4.3.2) requires the CS Terminal to participate in the CAAP's equipment procurement process.

MM AQ-20 – LNG Trucks

The 2008 EIS/EIR proposed MM AQ-20 to reduce the emissions of drayage trucks arriving at and departing from the CS Container Terminal. The measure required that LNG-fueled drayage trucks be used to convey containers to and from the terminal. The requirement has three phases: from 2012 through 2014, at least 50% of drayage trucks calling the terminal must be LNG-powered, from 2015 through 2017 at least 70%, and thereafter 100%. The 2008 EIS/EIR envisioned that LAHD would be responsible for the trucks and WBCT (the terminal operator) would be responsible for necessary gate modifications and operations to ensure compliance.

By the end of 2008, there were no LNG-fueled drayage trucks calling the CS Container Terminal because none were in service yet (the Port's LNG truck program was launched in 2009); note, however, that MM AQ-20 did not require LNG trucks until 2012. Accordingly, the CS Terminal was in compliance with MM AQ-20. As described in a study of the port drayage industry conducted by LAHD (LAHD, 2017), the requirement of MM AQ-20 is considered infeasible at the time of publication of this SEIR because of industry structural constraints, truck technology constraints, and financial constraints. These factors are described in detail in Section 2.5.2.1 of the Recirculated Draft SEIR.

Revised Project Modification

There is no feasible substitute or replacement measure for requiring a terminal-specific drayage truck fleet. Accordingly, the Revised Project does not include MM AQ-20.

With the implementation of a new port-wide Clean Trucks Program as required by the 2017 CAAP's goal to transition to zero-emissions technologies by 2035, future emission reductions from drayage would be achieved; however, no credit can be taken at this time. Furthermore, the Revised Project includes a new lease measure, LM AQ-2, below, that is expected to further reduce emissions from drayage trucks.

LM AQ-23 Throughput Tracking

The 2008 EIS/EIR included MM AQ-23, which required China Shipping to provide records of terminal throughput, in order to be able to assess whether actual future operations of the CS Container Terminal exceeded throughput assumptions on which the impact assessments, and therefore the mitigation measures, were based. If it was determined that these emissions sources exceed 2008 EIS/EIR assumptions, then staff would evaluate actual air emissions for comparison with the 2008 EIS/EIR. If that evaluation showed that criteria pollutant emissions exceeded those in the 2008 EIS/EIR, then new or additional mitigations would be applied through MM AQ-22 Periodic Review of New Technology and Regulations.

The measure was re-designated a lease measure (LM AQ-23) in the 2008 FEIR because it did not mitigate an identified impact. LM AQ-23 was to be applied through the LAHD's lease with China Shipping. Although the lease amendment was never implemented, the throughput tracking occurs through standard Port data collection.

Actual throughput has generally exceeded the projections in the 2008 EIS/EIR. However, the new analysis in the SEIR already takes into account the maximum capacity of the terminal and growth in TEU volume and applies all feasible mitigation measures to address future air quality impacts. Accordingly, periodic reviews of throughput are unnecessary. Furthermore, new technologies would continue to be considered and applied under Lease Measure AQ-22 Periodic Review of New Technology and Regulations, since this requirement is not being changed. Finally, new Lease Measure AQ-1, below, would ensure a regular check-in process and evaluation of the cleanest available technology when equipment is purchased or replaced by the tenant.

Revised Project Modification

LM AQ-23 is not included in the Revised Project.

MM TRANS-2, TRANS-3, TRANS-4, and TRANS-6

The 2008 EIS/EIR included several mitigation measures related to roadway improvements needed to reduce the impacts of project truck traffic at certain Port-area intersections. Three of those measures were not implemented by the dates specified in the measures. In addition, as described more fully in Section 3.3.2.2, conditions have changed since the certification of the 2008 EIS/EIR, which calls into question the need for and/or effectiveness of some of these mitigation measures.

MM TRANS-2 requires LAHD to provide an additional eastbound through lane on Anaheim Street at the intersection with Alameda Street by 2015. That project was never implemented and is not currently part of any planned or approved infrastructure project. A screening analysis conducted by LAHD (Appendix D of the Recirculated Draft SEIR) indicated that this location would no longer experience a traffic impact. Accordingly, the

Revised Project as originally proposed would have eliminated MM TRANS-2. (MM TRANS-2 appears in the Mitigation Monitoring and Reporting Program in its original form except with a revised implementation schedule because it was re-imposed in this SEIR as mitigation for the Revised Project's traffic impacts).

MM TRANS-3 requires that LAHD, by 2015, 1) provide additional southbound and westbound right-turn lanes on John S. Gibson Boulevard and I-110 NB ramps; 2) reconfigure the eastbound approach to one eastbound through-l eft-turn lane, and one eastbound through-right-turn lane; and 3) provide an additional westbound right-turn lane with westbound right-turn overlap phasing. The first two elements have been addressed by the John S. Gibson/I-110 Project, but the third one (westbound lane with westbound overlap phasing) was not part of the Gibson/I-110 Project and has not been completed. A screening analysis conducted by LAHD (Appendix D of the Recirculated Draft SEIR) indicated that this location would no longer experience a traffic impact. Accordingly, the Revised Project as originally proposed would have eliminated MM TRANS-3. (MM TRANS-3 appears in the Mitigation Monitoring and Reporting Program in its original form except with a revised implementation schedule because it was re-imposed in this SEIR as mitigation for a cumulative impact of the Revised Project).

MM TRANS-4 was intended to modify the intersection at Fries Avenue and Harry Bridges Boulevard by providing an additional westbound through-lane on Harry Bridges Boulevard and additional northbound, eastbound, and westbound right-turn lanes on Fries Avenue and Harry Bridges Boulevard. The measure was supposed to have been implemented by 2015, but has not been completed and is not part of any approved or planned infrastructure project. A screening analysis conducted by LAHD (Appendix D of the Recirculated Draft SEIR) indicated that this location would no longer experience a traffic impact. Accordingly, MM TRANS-4 would not be implemented under the Revised Project.

MM TRANS-6 required the LAHD to modify the Navy Way/Seaside Avenue intersection on Terminal Island by providing an additional eastbound through-lane on Seaside Avenue and reconfiguring the westbound approach to one left-turn lane and three through-lanes. The measure has not been completed and is not part of any approved or planned infrastructure project. However, a related transportation improvement project, the Navy Way and Seaside Interchange Project, would construct a new flyover connector from northbound Navy Way to westbound Seaside Avenue. The flyover improvement would provide direct ramp connections for existing left-turn movements, thereby eliminating conflicts between left-turn and through traffic. The improvement is scheduled to be implemented before 2026. Accordingly, MM TRANS-6 would not be implemented under the Revised Project.

Revised Project Modification

All four 2008 EIS/EIR mitigation measures related to transportation are not included in the Revised Project.

1.4.3.2 Revised Project New Lease Measures and New Mitigation Measure

LM AQ-1: Cleanest Available Cargo Handling Equipment

Subject to zero and near-zero emissions feasibility assessments that shall be carried out by LAHD, with input from Tenant as part of the CAAP process, Tenant shall replace cargo handling equipment with the cleanest available equipment anytime new or replacement equipment is purchased, with a first preference for zero-emission equipment, a second preference for near-zero equipment, and then for the cleanest available if zero or near-zero equipment is not feasible, provided that LAHD shall conduct engineering assessments to confirm that such equipment is capable of installation at the terminal.

Starting one year after the effective date of a new lease amendment between the Tenant and the LAHD, tenant shall submit to the Port an equipment inventory and 10-year procurement plan for new cargo-handling equipment, and infrastructure, and will update the procurement plan annually in order to assist with planning for transition of equipment to zero emissions in accordance with the forgoing paragraph.

LAHD will include a summary of zero and near-zero emission equipment operating at the terminal each year as part of mitigation measure tracking.

This new lease measure would ensure a regular check-in process and evaluation of the cleanest available technology in order to be consistent with, and address, 2017 CAAP goals for near-zero and zero-emissions equipment.

LM AQ-2: Priority Access for Drayage

A priority access system shall be implemented at the terminal to provide preferential access to zero- and near-zero-emission trucks.

Priority access would enable drivers with the cleanest trucks to get access to the terminal more quickly, thus allowing them to make more daily moves – called "turns" – and earn more revenue. Faster moves and higher earning potential could incentivize drivers and trucking companies to accelerate the investment in zero- and near-zero-emission trucks and to send these cleaner trucks to the CS Terminal because it would increase their business and reduce their fuel and idling time costs. Preferential access could involve giving drivers of clean trucks the first choice of coveted appointment/reservation slots, as envisioned in the 2017 CAAP, although other measures could be considered. An enhanced terminal appointment system would allow appointment-making rules resulting in increased efficiency and goods movement optimization measures. WBCT already operates an appointment system for all imported cargo and, for some time periods, for export cargo. The reduction in idling time and the increased use of clean trucks would reduce the overall emissions from drayage at the CS Terminal. The emissions reductions from this measure cannot be quantified at the time of publication of this SEIR.

LM AQ-3: Demonstration of Zero Emissions Equipment

Tenant shall conduct a one-year zero emission demonstration project with at least ten units of zero-emission cargo handling equipment. Upon completion, tenant shall submit a report to LAHD that evaluates the feasibility of permanent use of the tested equipment. Tenant shall continue to test the zero-emission equipment and provide feasibility assessments and progress reports in 2020 and 2025 to evaluate the status of zero-emission equipment technologies and infrastructure as well as operational and financial considerations, with a goal of 100% zero-emission cargo handling equipment by 2030.

MM GHG-1: LED Lighting

All lighting within the interior of buildings on the premises and outdoor high mast terminal lighting will be replaced with LED lighting or a technology with similar energy-saving capabilities within two years after the effective date of a new lease amendment between the Tenant and the LAHD or by no later than 2023.

LM GHG-1: GHG Credit Fund

LAHD shall establish a Greenhouse Gas Fund, which LAHD shall have the option to accomplish through a Memorandum of Understanding (MOU) with the California Air Resources Board (CARB) or another appropriate entity. The fund shall be used for GHG-reducing projects and programs approved by the Port of Los Angeles, or through the purchase of emission reduction credits from a CARB approved offset registry. It shall be the responsibility of the Tenant to make contributions to the fund in the amount of $250,000 per year, for a total of eight years, for the funding of GHG reducing projects or the purchase of GHG emission reduction credits, commencing after the date that the SEIR is conclusively determined to be valid, either by operation of Public Resources Code Section 21167.2 or by final judgment or final adjudication ("Conclusive Determination of Validity Date"), as described below. The fund contribution amount is established as follows: (i) the peak year of GHG operational emissions (2030), after application of mitigation, that exceed the established threshold for the Revised Project, estimated in the SEIR to be 129,336 metric tons CO_2e, multiplied by (ii) the current (2019) market value of carbon credits established by CARB at $15.62 per metric ton CO_2e. The payment for the first year shall be due within ninety (90) days of the Conclusive Determination of Validity Date, and the payment for each successive year shall be due on the anniversary of the Conclusive Determination of Validity Date. If LAHD is unable to establish the fund through an MOU with CARB within one year prior to when any year's payment is due, the Tenant shall instead apply that year's payment, using the same methodology described in parts (i) and (ii) above, to purchase emission reduction credits from a CARB approved GHG offset registry.

1.5 Changes to the Recirculated Draft EIR

The Final SEIR discusses changes and modifications that have been made to the Recirculated Draft SEIR. Actual changes to the text, organized by chapters, sections, and appendices, are presented in Chapter 3, "Modifications to the Recirculated Draft EIR," of this Final SEIR.

Changes noted in Chapter 3 are identified by text strikeout and underline. These changes are referenced in Chapter 2, "Response to Comments," of this Final SEIR, where applicable. The changes and clarifications presented in Chapter 3 were reviewed to determine whether or not they warranted recirculation of the EIR prior to certification according to CEQA Guidelines and Statutes. The changes would not result in any new significant environmental impacts or a substantial increase in the severity of an existing environmental effect.

Below is a brief summary of key changes made, which are described in more detail in Chapter 3 of this Final SEIR.

- Mitigation measure MM AQ-10 was revised in response to a comment to eliminate the option for an alternative compliance plan for the Vessel Speed Reduction Program.
- Lease Measure LM GHG-1 was revised in response to comments to alter the formula by which the funding amount is calculated, to increase the funding amount, and to revise the implementation mechanism and schedule.
- The air quality analysis (Section 3.1) was supplemented to provide additional information regarding potential health effects of project-related criteria pollutant emissions on local and regional populations.

- The analysis of future emissions from ocean-going vessels was revised in response to comments pointing out discrepancies in the treatment of hoteling emissions. The re-analysis did not change the impact determinations.
- Minor text changes were made to correct inconsistencies and typographical errors in the document.

The above changes are consistent with the findings contained in the Recirculated Draft SEIR, as modified. There would be no new or increased significant effects on the environment due to the changes in the Revised Project. Therefore, recirculation is not required consistent with Public Resources Code Section 21092.1 and CEQA Guidelines Section 15088.5.

1.6 References for Chapter 1

CARB, 2007a. Regulations to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels while At-Berth at a California Port; Technical Support Document. www.arb.ca.gov/regact/2007/shorepwr07/tsd.pdf.

CARB, 2007b. Final Statement of Reasons for Rulemaking. Public Hearing to Consider the Adoption of Proposed Regulations to Reduce Emissions from Diesel Auxiliary Engines on Ocean-Going Vessels While At-Berth at a California Port. http://www.arb.ca.gov/regact/2007/shorepwr07/fsor2007.pdf.

LAHD, 1997. West Basin Transportation Improvements Program EIR. Prepared by the Environmental Management Division with Assistance from Science Applications International Corporation.

LAHD, 2016. Cost Scenarios for Expenditure on Cargo-Handling Equipment. Internal LAHD data. July, 2016

LAHD, 2017. Assessment of the Feasibility of Requiring Alternative-Technology Drayage Trucks at Individual Container Terminals. Final Report. Prepared by Ramboll Environ. April, 2017.

LAHD and USACE, 2008. Final EIS/EIR for the Port of Los Angeles Berths 97-109 China Shipping Container Terminal Project. https://www.portoflosangeles.org/EIR/ChinaShipping/FEIR/feir_china_shipping.asp

Chapter 2
Response to Comments

2.1 Distribution of the Recirculated DSEIR

The Recirculated DSEIR prepared for the LAHD was distributed to the public and regulatory agencies on September 28, 2018, for a 45-day review period. Approximately 59 printed and digital copies (CD) of the Recirculated DSEIR were distributed to various government agencies, organizations, individuals, and Port tenants. The LAHD conducted a public hearing regarding the Recirculated DSEIR on October 25, 2018, to provide an overview of the Revised Project and to accept public comments on the Revised Project and the environmental document.

Printed and digital copies of the Recirculated DSEIR were available for review at the following locations:

- Los Angeles Harbor Department, Environmental Management Division, 222 West 6th Street, Suite 900, San Pedro, CA 90731
- Los Angeles Public Library - Central Branch, 630 West 5th Street, Los Angeles, CA 90071
- Los Angeles Public Library - San Pedro Branch, 931 South Gaffey Street, San Pedro, CA 90731
- Los Angeles Public Library - Wilmington Branch, 1300 North Avalon, Wilmington, CA 90744

In addition to printed copies of the Recirculated DSEIR, digital copies were made available in response to specific requests. Due to the size of the document, the digital copies were prepared as a series of PDF files to facilitate downloading and printing. Members of the public were also invited to request a CD containing the Recirculated DSEIR. Digital copies of the Recirculated DSEIR on CD were available free of charge to interested parties. The Recirculated DSEIR was available in its entirety on the Port web site at https://www.portoflosangeles.org/environment/environmental-documents.

2.2 Comments on the Recirculated DSEIR

The public comment and response component of the CEQA process serves an essential role. It allows the respective lead agencies to assess the impacts of a project based on the analysis of other responsible, concerned, or adjacent agencies and interested parties, and it provides an opportunity to amplify and better explain the analyses that the lead agencies have undertaken to determine the potential environmental impacts of a project. To that extent, responses to comments are intended to provide complete and thorough explanations to commenting agencies and individuals, and to improve the overall understanding of the Project for the decision-making bodies.

The LAHD received ten comment letters on the Recirculated DSEIR during the public review period. One verbal comment was received at the public hearing. Table 2-1 presents a list of those agencies, organizations, and individuals who commented on the Recirculated DSEIR; one letter (NRDC DSEIR) commenting on the Draft SEIR released in 2017 is included because the same entity's letter commenting on the Recirculated DSEIR requested that their earlier comments be incorporated.

Table 2-1: Public Comments Received on the Recirculated DSEIR

Letter Code	Date	Individual/Organization	Page
State Government			
SCH-1	19 November 2018	Scott Morgan State Clearinghouse Governor's Office of Planning and Research	2-27
Regional and Local Government			
SCAQMD	30 November 2018	Jillian Wong, Ph.D. Planning, Rule Development & Area Sources South Coast Air Quality Management District	2-28
BOS	22 October 2018	Ali Poosti Wastewater Engineering Services Division Los Angeles Bureau of Sanitation	2-45
Organizations			
CFASE	16 November 2018	Jesse Marquez Coalition for a Safe Environment et al.	2-46
CSPNC	13 November 2018	Alexander Hall Central San Pedro Neighborhood Council	2-63
CoSPNC	29 October 2018	Doug Epperhart Coastal San Pedro Neighborhood Council	2-65
NRDC	16 November 2018	Melissa Lin Perrella Natural Resources Defense Council et al.	2-66
NDRC.K1 (Attachment K1)	14 November 2018	Melissa LinPerrella Natural Resources Defense Council et al.	2-98
NRDC DSEIR	29 September 2017	Melissa Lin Perrella Natural Resources Defense Council et al.	2-100
NRDC.I1 (Attachment I1 to 2017 comment letter)	26 September 2017	Melissa Lin Perrella Natural Resources Defense Council et al.	2-106
Individuals			
HAVENICK	30 October 2018	Richard Havenick	2-109
BRIGANTI	14 November 2018	Tony Briganti	2-110

Letter Code	Date	Individual/Organization	Page
Public Hearing Comments			
PH	25 October 2018	Jesse Marquez Coalition for a Safe Environment	2-111

2.3 Responses to Comments

In accordance with CEQA (Guidelines Section 15088), the LAHD has evaluated the comments on environmental issues received from agencies and other interested parties and has prepared written responses to each comment pertinent to the adequacy of the environmental analyses contained in the Recirculated DSEIR. In compliance with CEQA Guidelines Section 15088(b), the written responses address the environmental issues raised. In addition, where appropriate, the basis for incorporating or not incorporating specific suggestions into the Revised Project is provided. In each case, the LAHD expended a good faith effort, supported by reasoned analysis, to respond to comments.

This section includes responses not only to the written comments received during the 45-day public review period of the Recirculated DSEIR, but also verbal comments made at the public hearing for the Recirculated DSEIR. Some comments have prompted revisions to the text of the Recirculated DSEIR, which are referenced and shown in Chapter 3, "Modifications to the Recirculated DSEIR." A copy of each comment letter/comment is provided, and responses to each comment letter immediately follow. All of the comments received and the responses to those comments will be considered by the decision-makers prior to taking any action on the Revised Project.

Several comments on the Recirculated DSEIR claimed that the document should be revised and recirculated for additional public review and comment. The following response discusses the standards generally applicable to this issue under CEQA and applies those standards to the comments requesting recirculation.

A lead agency is required to recirculate a Draft EIR when the agency adds "significant new information" to the EIR after the close of the public comment period but prior to certification of the Final EIR (Public Resources Code Section 21092.1; State CEQA Guidelines Section 15088.5). "New information added to an EIR is not 'significant' unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement" (State CEQA Guidelines Section 15088.5(a)). "Significant" new information includes information showing that "(1) [a] new significant environmental impact would result from the project or from a new mitigation measure proposed to be implemented [;] or (2) [a] substantial increase in the severity of an environmental impact would result unless mitigation measures are adopted that reduce the impact to a level of insignificance" (State CEQA Guidelines Section 15088.5 (a)(1), (a)(2)).

The Resources Agency adopted Section 15088.5 of the State CEQA Guidelines in order to incorporate the California Supreme Court's decision in Laurel Heights Improvement Assn. v. Regents of the Univ. of Cal. (1993) 6 Cal.4th 1112. According to the Supreme

Court, the rules governing recirculation of a Draft EIR are "not intend[ed] to promote endless rounds of revision and recirculation of EIRs" (Laurel Heights II, supra, 6 Cal.4th at p. 1132). Instead, recirculation is "an exception, rather than the general rule" (Mount Shasta Bioregional Ecology Center v. County of Siskiyou (2012) 210 Cal.App.4th 184, 221).

Under these standards, a change to a proposed project, made in response to comments on a Draft EIR, generally does not trigger the obligation to recirculate the Draft EIR. "The CEQA reporting process is not designed to freeze the ultimate proposal in the precise mold of the initial project; indeed, new and unforeseen insights may emerge during investigation, evoking revision of the original proposal" (County of Inyo v. City of Los Angeles (1977) 71 Cal.App.3d 185, 199; see River Valley Preservation Project v. Metropolitan Transit Development Bd. (1995) 37 Cal.App.4th 154, 168, fn. 11).

As these cases recognize, CEQA encourages the lead agency to respond to concerns as they arise, by adjusting a project or developing mitigation measures, as necessary. That a project evolves to address such concerns is evidence of an agency performing meaningful environmental review. A rule requiring recirculation of the Draft EIR any time a project changes would have the perverse unintended effect of calcifying or freezing the original proposal, and of penalizing the lead agency or the project sponsor for revising the project in ways that may be environmentally benign or even beneficial. In light of this policy concern, the courts uniformly hold that the lead agency need not recirculate the Draft EIR merely because the proposed project evolves during the environmental review process (see, e.g., Citizens for a Sustainable Treasure Island v. City and County of San Francisco (2014) 227 Cal.App.4th 1036, 1061-1065 [project modification requiring consultation with Coast Guard regarding building designs did not require recirculation of Draft EIR]; South County Citizens for Smart Growth v. County of Nevada (2013) 221 Cal.App.4th 316, 329-332 [identification of staff-recommended alternative after publication of Final EIR did not trigger obligation to recirculate Draft EIR because alternative resembled other alternatives that the EIR had already analyzed]; Western Placer Citizens for an Agricultural and Rural Environment v. County of Placer (2006) 144 Cal.App.4th 890, 903-906 [revision in phasing plan did not trigger recirculation requirement because revision addressed environmental concerns identified during EIR process]).

Similarly, information that clarifies or expands on information in the Recirculated DSEIR does not require recirculation (see, e.g., North Coast Rivers Alliance v. Marin Municipal Water Dist. Bd. of Directors (2013) 216 Cal.App.4th 614, 654-656 [addition of a hybrid alternative to the Final EIR did not trigger duty to recirculate the Draft EIR]; Clover Valley Foundation v. City of Rocklin (2011) 197 Cal.App.4th 200, 219-224 [information regarding presence of cultural resources on property did not require recirculation because information amplified on information that was already in Draft EIR]; California Oak Foundation v. Regents of Univ. of Cal. (2010) 188 Cal.App.4th 227, 266-268 [letters addressing seismic risks did not trigger duty to recirculate Draft EIR, where letters recommended further analysis but did not contradict conclusions in Draft EIR]; Cadiz Land Co. v. Rail Cycle, L.P. (2000) 83 Cal.App.4th 74, 97 [commenter's disagreement with analysis of groundwater flow in EIR did not require recirculation because substantial evidence supported EIR's analysis; lead agency had discretion regarding which expert to rely upon]; Marin Municipal Water Dist. v. KG Land California Corp (1991) 235 Cal.App.3d 1652, 1666-1668 [clarifying information regarding potential length of moratorium was not "significant new information"]).

The following discussion applies these standards to the comments stating that the LAHD should recirculate the Recirculated DSEIR. In particular, the discussion focuses on whether the information provided in the comment is new, and whether that information discloses:

- A new significant impact that the project or mitigation would cause,
- An impact that would be substantially more severe unless mitigation is adopted that avoids the impact,
- A feasible project alternative is available that would avoid a significant impact, but the applicant will not adopt it, or
- That the Draft EIR is "fundamentally and basically inadequate" such that meaningful public comment was precluded (CEQA Guidelines Section 15088.5(a)).

In the instance of the Recirculated DSEIR, a number of comments were provided on the document. Comments were provided on nearly every impact addressed in the Recirculated DSEIR. The responses to comments are extensive, in large part because the comments were also extensive. The responses to comments provide the following information:

- First and foremost, the responses address the environmental concerns raised by the comments, and describe how they are addressed in the document;
- They provide corrections to the text, where such corrections are warranted;
- They expand on or provide minor clarifications to information already included in the Recirculated DSEIR in those instances where comments question this information; and
- They result in proposals for new mitigation measures that may more effectively reduce already identified significant environmental impacts of the project.

However, none of the conditions warranting recirculation of a Draft EIR, as specified in State CEQA Guidelines Section 15088.5 and described above, has occurred. As a result of responses to comments and the addition of new information, no new significant impacts would result; there is no increase in the severity of a significant impact identified in the Draft EIR, following mitigation; and as to the Recirculated DSEIR adequacy, the LAHD believes the SEIR is complete and fully compliant with CEQA.

2.3.1 Master Responses

Because several of the comment letters received had similar concerns, a set of master responses were developed to address common topics in a comprehensive manner. The following Master Responses section includes feedback on the following topics:

1. Feasible Mitigation – Guidance and Applicability
2. Zero- and Near-Zero-Emissions Technologies
3. Port-wide Emission Reduction Programs
4. Non-Compliance with the Original FEIR MMs
5. Comparative Emissions

Individual responses to all comment letters/comments received on the Recirculated DSEIR are presented following the Master Responses and may refer to the Master Responses in total or in part.

2.3.1.1 Master Response 1: Feasible Mitigation – Guidance and Applicability

Several comments questioned whether all feasible mitigation measures have been identified within the Recirculated DSEIR to reduce impacts to the maximum extent feasible. This response describes the CEQA requirements for consideration of mitigation measures.

Mitigation is required only for significant environmental impacts (PRC 21100(b)(3); State CEQA Guidelines Sections 15126.4(a)(1)(A) and 15064(e)). An EIR should focus on mitigation measures that are feasible, practical, and effective (PRC 21003(c); Napa Citizens for Honest Govt. v. Napa County Bd. of Supervisors (2001) 91 Cal.App.4th 342, 365). An agency may reject mitigation measures or project alternatives if it finds them to be "infeasible" (PRC 21081(a)(3); State CEQA Guidelines Section 15091(a)(3)). "Feasible" is defined as "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors" (PRC 21061.1; State CEQA Guidelines Section 15364). Consideration of feasibility of mitigation measures may also be based on practicality (No Slo Transit, Inc. v. City of Long Beach (1987) 197 Cal.App.3d 241, 257). CEQA "does not demand what is not realistically possible, given the limitation of time, energy and funds" (Concerned Citizens of South Central Los Angeles v. Los Angeles Unified Sch. Dist. (1994) 24 Cal.App.4th 826, 841).

Per these requirements, LAHD has complied with its legal obligation under CEQA to substantially lessen or avoid significant environmental effects to the extent feasible. The mitigation measures presented in the Recirculated DSEIR represent the expert opinions of the preparers of the Recirculated DSEIR regarding how best to effectively, and feasibly, substantially reduce or avoid the Revised Project's significant environmental effects. Further, those mitigation measures have been subjected to public review and scrutiny through the Recirculated DSEIR process.

LAHD recognizes that comments frequently offer thoughtful suggestions regarding how a commenter believes that a particular proposed mitigation measure can be modified, or perhaps changed significantly, in order to more effectively, in the commenter's view, reduce the severity of environmental effects. In addition, while a lead agency is required to respond to comments proposing concrete, obviously feasible mitigation measures, it is not required to accept suggested mitigation measures (A Local and Regional Monitor (ALARM) v. City of Los Angeles (1993) 12 Cal. App. 4th 1773, 1809). In determining whether to accept a commenter's suggested changes, either in whole or in part, LAHD has considered, among others, the following factors: (i) whether the proposed revisions are feasible from an economic, technical, operational, legal, environmental, or other standpoint; (ii) whether the proposed revisions represent a clear improvement, from an environmental standpoint, over the draft language that a commenter seeks to replace; and (iii) whether the proposed revisions are sufficiently clear as to be easily understood by those who will implement them.

LAHD took seriously every suggestion made by commenters and appreciated the effort that went into the formulation of suggestions. LAHD staff and consultants spent significant time carefully considering proposed suggestions for new and revised mitigation measures and in some instances adopted some or all of what a commenter suggested. LAHD has identified, and proposed to incorporate, all feasible mitigation measures, including feasible revisions to the existing mitigation measures recommended by commenters. No additional mitigation measures have been determined to be feasible to reduce significant impacts disclosed in the Recirculated DSEIR; however, MM AQ-10 (Vessel Speed Reduction Program) has been modified to remove the possibility of a vessel operator submitting an alternative compliance plan for the Port's consideration. The feasibility of other specific suggested measures is discussed in the individual responses below, as appropriate.

2.3.1.2 Master Response 2: Zero- and Near-Zero-Emissions Technologies

A number of commenters stated or implied that the Recirculated DSEIR did not include a meaningful commitment to zero-emissions technologies. This master response addresses those comments by describing the current feasibility status of the technologies being considered by the Port, its tenants, industry, and regulatory agencies for use in marine terminals in San Pedro Bay.

Background

The Port is committed to finding new ways to reduce emissions from ships, trains, trucks, harbor craft and cargo handling equipment. A key tool in the Port's efforts to reduce pollution is the Clean Air Action Plan (CAAP), which outlines the goals, objectives, and initiatives of the Port of Los Angeles and the Port of Long Beach in the field of air pollution reduction. With the ultimate policy goal of eliminating all pollution from port-related operations, the CAAP promotes the testing of emerging technology to bring emission down to zero. The first iteration of the CAAP was approved in 2006; the latest update was adopted by the two ports in 2017. The 2017 CAAP commits the Port to incorporating near-zero and zero-emission technologies into the operations of the Port and its tenants, with the goal of achieving zero-emissions operations by 2035.

While the CAAP has been very successful at encouraging substantial emission reductions, further reductions are needed Port-wide as throughput continues to increase in the coming years. Furthermore, the LAHD has identified zero-emission equipment as a critical element to be integrated into marine-related goods movement in order to meet greenhouse gas (GHG) reduction deadlines (see the 2017 Clean Air Action Plan). The development and deployment of new technology involves the following four steps: (1) research and development; (2) technology development and demonstration; (3) pre-production deployment and assessments; and, (4) early production deployments. As the project summaries below illustrate, none of the zero-emission technologies has progressed significantly beyond step 3.

The Technology Status Report – Zero Emission Drayage Trucks (TIAX, 2011), prepared for the Ports of Los Angeles and Long Beach, examined the state of current zero-emission technologies and outlined a reasonable, programmatic approach to commercialization, based on thorough demonstration and evaluation. The report concluded that a two-phase demonstration approach to commercialization is needed. The first phase would be a small-scale (one to three units) demonstration to test basic technical performance. This would be followed by the second phase consisting of a broader, large-scale (ten to twenty units) demonstration to assess how the technologies fit into existing operations on a multi-unit basis. Since that time, a number of demonstration and pilot projects have taken place at the Ports, as described below.

In July 2011, at a joint meeting with the Harbor Commissions of the Ports of Los Angeles and Long Beach (also called the San Pedro Bay Port Complex), staff of the two Ports presented the Roadmap for Zero Emissions (Port of Long Beach and Port of Los Angeles, 2011). That document expresses the Ports' commitment to zero-emission technologies by establishing a reasonable framework for future identification, development, and testing of non-polluting technologies for moving cargo. The Ports of Los Angeles and Long Beach's joint San Pedro Bay Ports Technology Advancement Program (TAP) funds efforts to evaluate and demonstrate new technologies such as zero-emission trucks and cargo-handling equipment (CHE) that could further reduce emissions from goods movement. The Ports of Los Angeles and Long Beach regularly meet with technology developers to stay informed about new and emerging technologies that may provide options for reducing emissions from Port operations. Recommendations from the TAP are taken to the Boards of Harbor Commissioners when selecting and funding projects. Annual status reports on the TAP's completed and ongoing projects are provided on the TAP website at http://www.cleanairactionplan.org/technology-advancement-program/.

As detailed in Section 1.10.2.1 of the Recirculated DSEIR, in September 2015, the LAHD released a draft Zero Emission White Paper to assist the Port in moving toward the adoption of zero-emission technologies for moving cargo on and off Port terminals to a final destination. The LAHD has provided more than $7 million in funding for projects aimed at developing zero-emission technology for short-haul drayage trucks and CHE; one of the specific priorities of the 2018 TAP is to allocate up to $500,000 from each Port to support the pilot deployment of a fleet of 50 to 100 zero-emissions trucks and to evaluate infrastructure needs for those trucks. Initial testing of zero-emission vehicles showed mixed results, but more recent progress has been made that reinforces the LAHD's belief that zero-emission container movement technologies show great promise for helping to reduce criteria pollutant and GHG emissions.

While zero-emission technologies are promising, they require longer-term evaluations to establish the technical viability, operational reliability, and the ability to attract participation from established original equipment manufacturers that will lower acquisition and maintenance costs and allow this equipment to become commercially viable. Zero-emission technology also presents many operational concerns, such as charging/fueling times, maintenance issues, and lack of support infrastructure, that need to be examined prior to full deployment into the fleet. Additionally, durability, loss of power potential, and safety need to be monitored through testing before stakeholders commit to large capital investments. Existing data in these areas are extremely limited, although several demonstration projects are currently underway.

Further, without the completion of the real-world fleet testing with full loads and full duty cycles, including longer-term mechanical service and reliability over a sufficient demonstration period, a system that later proved to be unreliable would result in disruption and delay of cargo flow and trade at the Port Complex. In recognition of the potential future promise of such technologies, LAHD has included a lease measure (LM) in the Revised Project that requires periodic technology reviews (LM AQ-1). This lease measure will ensure that the tenant reconsiders the feasibility of zero- and near-zero-emission technologies in the future as the technologies continue to develop. In addition, as required by LM AQ-3 and LM AQ-22, the tenant will be required to confer with LAHD any time they are replacing any CHE.

Drayage Trucks

Real-world, in-use data is essential, particularly when deploying new technologies on public roads, as is the case with drayage applications. In addition to the demonstration projects summarized below, information on planned zero-emission truck development can be found at the Port's website: https://www.portoflosangeles.org/environment/air-quality/zero-emissions-technologies.

Technology Development and Demonstration: Over the past 15 years, a number of projects, most co-funded by the Ports of Los Angeles and Long Beach, have involved the development and testing of zero- and near-zero-emissions drayage trucks. Example projects include:

- In 2006, LAHD co-funded with SCAQMD the world's first plug-in, battery-powered, heavy-duty truck prototype.
- Zero Emission Cargo Transport Project (ZECT I). SCAQMD's project began in 2012 and developed and tested a variety of battery-electric and plug-in hybrid-electric configurations (SCAQMD, 2016a). A few battery-electric units were deployed by Port drayage truck operators in near-port service (because of their limited range and long charging times) and others were subjected to dynamometer testing and limited on-road testing. In 2012, Balqon units completed a preliminary demonstration which included several round-trips from a near-dock railyard to Port terminals. SCAQMD concluded, however, that the major constraints to the deployment of battery-electric trucks were their short range and long charging times, the lack of supporting infrastructure and charging standards, high capital costs, and the fact that the technology is still unproven (SCAQMD, 2016b). The plug-in hybrid units had auxiliary power units fueled variously by CNG, LNG, and diesel, and most of their participation in the ZECT I project involved development and laboratory testing of the units.
- Zero Emission Cargo Transport Project (ZECT II). In the follow-up ZECT II project, six fuel-cell/battery-electric hybrids and one natural gas/battery-electric hybrid were developed and assembled to be tested for drayage service (CAAP, 2017). As of late 2018, none of the units had entered revenue service in their planned demonstration tests pending completion of development and resolution of a number of design and fabrication issues. One model entered an in-service demonstration deployment in 2018 that revealed a number of operational and technical flaws (Port of Los Angeles and Port of Long Beach, 2019).
- Zero-Emission Drayage Truck Demonstration Project. SCAQMD is supporting the deployment of 43 zero- and near-zero-emission trucks, mostly battery-electric models. The trucks will be built by Daimler (20 units) and Volvo (23 units) and will be deployed in demonstration service between the ports and various inland warehouse destinations. The $120 million program includes the installation of charging systems (partially solar powered) and other features.
- Technology Advancement Program (TAP) Two TAP programs began evaluating the operation of a near-zero emission (NZE) natural gas engine in drayage service and aftertreatment emission reduction technologies in heavy-duty engines. In a six-month demonstration deployment, the NZE drayage truck accomplished over 500 revenue trips, traveled over 18,000 miles, and experienced no unusual service or maintenance issues. The aftertreatment

project was still underway as of late 2018 (Port of Los Angeles and Port of Long Beach, 2019).

- Large-Scale Zero Emission Truck Deployment Pilot Project. The Ports are preparing a scope of work for demonstrating a large-scale (50-100 units) deployment of zero-emission drayage trucks in field operation and are currently assembling trucking and truck manufacturing company partners (CAAP, 2019).
- Zero Emission Near-Zero Emission Freight Facilities. In September 2018 the Ports received substantial grants from CARB that will support the deployment of 10 Kenworth/Toyota hydrogen-fuel-cell-powered trucks in the Port of Los Angeles's "Shore to Store" program and 15 Peterbilt/Transpower battery-electric-powered drayage trucks in the Port of Long Beach's START program. The POLA program was approved by the Board in March, 2019, and contracting details are being worked out.
- SCAQMD's eHighway. SCAQMD's project tested the concept of heavy-duty trucks utilizing an overhead electric catenary system on designated highways (Siemens, 2018). The study constructed a catenary system on one mile of Alameda Street and outfitted three Class 8 trucks with pantographs and electric traction motors. After six months of testing in 2017, the study concluded that the concept was viable, but identified a number of hurdles that would need to be overcome for commercial application to be contemplated, including high infrastructure costs, conflicts with utilities and traffic, design flaws, and reliability issues.
- Early Adopter Truck Incentive Program. The Ports have committed to supporting a near-zero natural gas drayage trucks deployment project through a CEC grant secured by SCAQMD that is expected to fund up to 140 low-NO_x trucks. SCAQMD is contracting with trucking companies to deploy the trucks by the end of 2019.

Current Status of Zero- and Near-Zero-Emission Drayage Truck Technology: These projects and others were considered in a recent evaluation, required by the 2017 CAAP, of the feasibility of zero- and near-zero-emissions technology for drayage applications (Tetra Tech/GNA, 2019a). That study evaluated "the ability of alternative fuel/technology drayage trucks to provide similar or better overall performance and achievement compared to today's baseline diesel drayage trucks, when broadly used for all types of drayage service". Evaluation parameters included: commercial availability, technical viability, operational feasibility, availability of fuel and infrastructure, and economic workability. The first two parameters were applied in an initial screening, and technologies that passed that screening were further assessed according to the remaining three parameters.

The study concluded that as of late 2018, one zero-emission Class 8 truck model and several near-zero-emission models are commercially available from original equipment manufacturers (OEMs). For the zero-emission truck, BYD offers a battery-electric model in what the report called an "early commercial launch". Six OEMs offer natural-gas-fueled near-zero-emissions models, all powered by the same Cummins Westport engine. The natural-gas-fueled technologies already appear to have exhibited adequate technical viability, and the report's authors expect the battery-electric technology to achieve that status within a few years, possibly as early as 2021. The other three technologies – zero-emission fuel cell, near-zero-emission hybrid-electric, and near-zero-emission diesel –

were not deemed commercially available and did not appear to be likely to be available by 2021; furthermore, none has adequately demonstrated technical viability. Accordingly, those technologies cannot at this time be considered feasible for drayage applications and were not considered further in the study.

In terms of operational feasibility, infrastructure availability, and economic workability, the study found that the battery-electric technology is promising but still faces challenges and constraints. Although battery-electric trucks actually outperform diesel trucks in terms of power, torque, and grade-climbing ability, they have limited range, they are heavier than conventional trucks, and they take a long time to charge. Their short range put limits on the assignments they can handle, the heavier curb weight reduces the weight of the container they can haul, and the long recharging times reduce the time they are in revenue service each day. Furthermore, there is only one OEM currently supporting these trucks and there is very limited charging infrastructure in place, so that large-scale deployment will need to await the development of additional service facilities or the entry of additional OEMs, as well as the development of widespread charging infrastructure. Accordingly, the study concluded that at this time battery-electric trucks are only suitable for limited niche operations within the drayage industry. Finally, the study projected that the life-time cost of battery-electric trucks would, without substantial financial incentives, be approximately 30% more than the cost of diesel or natural-gas-fueled trucks. Currently available incentives reduce the cost to well below the cost of a diesel unit, meaning that as long as incentives last, battery-electric trucks could have a substantial financial advantage; the study points out, however, that the incentives are not guaranteed over the 12-year life of a truck, and that existing incentive funding would only cover approximately 1,700 trucks, whereas the port drayage fleet has approximately 16,000 trucks.

<u>Summary</u>: The current generation of natural-gas-powered near-zero-emission trucks closely resemble their diesel counterparts in most evaluation areas and do not appear to pose serious operational feasibility challenges to widespread deployment. Earlier problems with lack of power appear to have been resolved with larger, better-designed engines. The major challenge that was identified was the need for natural gas fueling infrastructure to expand regionally fast enough to support large-scale deployment. The Clean Trucks Program strategy outlined in the 2017 CAAP recognizes that near-zero-emission technology for drayage trucks has matured to the point of commercial feasibility. Accordingly, starting in 2020 only near-zero-emission trucks will receive a fee exemption for entering Port terminals, and starting in 2023 all new entries to the Port Drayage Truck Registry must meet or exceed the near-zero-emission standard. The effect of this policy, at the CS Terminal as at every marine terminal in the port complex, will be to increase the proportion of near-zero- and zero-emission trucks that pass through the terminals' gates over time. This will occur because trucking firms will be incentivized to replace older trucks with trucks meeting the latest standards in order to ensure access to the terminals under competitive financial terms.

The technology of heavy-duty, electric-drive engines with the potential for zero emissions has advanced greatly in recent years. LAHD has been a leader in developing and testing zero-emission, heavy-duty trucks that could be used in drayage service, and has sent a clear message to technology providers that zero-emission technologies are needed as soon as practicable. However, as recently as 2015 zero-emission drayage truck technology was characterized by CARB only as "promising" (CARB, 2015), and the 2017 CAAP stated that most near-zero and zero-emission technologies may take several years to become commercialized and feasible for drayage. Although the 2019 Feasibility Study (Tetra Tech/GNA, 2019a) documented significant progress, it concluded that considerably more progress needs to be made in order to bring zero-emission technology into widespread use in the drayage industry. The 2017 CAAP recognizes that it is too early to mandate specific requirements for zero-emission technology in the drayage fleet, but it is appropriate to modify the truck rate such that by 2035 only zero-emission trucks will receive fee exemptions.

Cargo-Handling Equipment (CHE)

Cargo-handling equipment is the general term for the equipment use to move containers and other types of cargo around in marine terminals. CHE, which has traditionally been powered by diesel engines, is considered as off-road equipment because it is not certified for use on public highways. LAHD is focused on the development of zero and near-zero-emission technologies for CHE and is in the process of developing and testing various CHE technologies at several Port terminals. These efforts are being undertaken in concert with the Port of Long Beach and with a number of government agencies (e.g., CARB and the SCAQMD), marine terminal operators, and original equipment manufacturers (OEM). The Port's recent feasibility review, required by the 2017 CAAP, evaluated the zero- and near-zero-emission CHE technologies currently being developed for port use with respect to their commercial and technical viability, operational feasibility, availability of supporting infrastructure, and economic workability (Tetra Tech/GNA, 2019b).

Yard Tractors: Yard tractors, also known as hostlers, are used in container terminals to move chassis loaded with containers around the terminal. Typical movements are between the container storage areas (stacks or wheeled) and the wharf cranes, between container storage areas and the on-dock railyard, and between storage areas. As of late 2018, approximately 1,700 yard tractors were in service in the San Pedro Bay ports' marine terminals (Tetra Tech/GNA, 2019b). Yard tractors have traditionally been powered by heavy-duty diesel engines (typically in the range of 200–300 horsepower) and are generally rated for off-road use. Recently, however, increasing numbers of yard tractors have been ordered with natural-gas-fueled (generally, propane) engines, although these units are not considered near-zero emission CHE because of their NO_X emissions. Currently there are approximately 300 yard tractors fueled by natural gas (propane) or, in a few cases, gasoline, but in general these are powered by older engine models that have been discontinued (Tetra Tech/GNA, 2019b).

<u>Technology Development and Demonstration:</u> LAHD has participated in funding numerous zero-emission and near-zero-emission yard tractor projects through the TAP, including plug-in battery-electric yard tractors and a hydrogen fuel cell yard tractor. Tetra Tech/GNA (2019b) list a total of 16 key yard tractor demonstration projects in the San Pedro Bay ports, although only two have been completed. Example demonstration projects include:

- In 2013, CARB selected the Ports of Los Angeles and Long Beach to be recipients of grant funding for a two-year project to develop and demonstrate two electric yard tractors developed by TransPower. Similar tractors were demonstrated under a California Energy Commission (CEC) grant at the Port of San Diego.
- <u>Balqon E-30 Electric Terminal Tractor Development and Demonstration Project</u>. The Port has been proactive in working with manufacturers (such as Balqon and

TransPower) to design and produce prototype plug-in electric yard tractors, which operate on lithium-ion batteries. In this project, which took place between 2008 and 2012, the Port purchased 14 battery-electric units and a charging system for in-use test deployment. Initial testing of the third generation of Balqon yard tractors at the California Cartage Intermodal Facility in 2011 indicated that the units were capable of operating for approximately 12 hours on a single charge. Balqon, however, is no longer producing CHE, having gone out of business.

- Hybrid Yard Hostler Demonstration and Commercialization Project. This 2010 TAP project involved three hybrid (diesel-battery-electric) yard tractors. The three units were put into service at the Port of Long Beach for a period of 6 months performing ship, rail, and dock work, with a goal of measuring the emissions of a conventional and hybrid yard tractor following cycles developed from monitoring in-use activities. Results indicated that at low loads, the hybrid consumed about 7 percent more fuel and at high loads about 3 percent less fuel than the conventional diesel tractor, while nitrogen oxide (NOx) emissions were reduced at both load levels. Because the results did not indicate fuel savings for the hybrid yard hostler, further refinement of the hybrid drive system design was recommended to improve fuel economy.
- Liquefied Natural Gas (LNG) Yard Hostler Demonstration and Commercialization Project. This project assessed the performance and emissions of three LNG yard tractors over 8 months from June 2006 to January 2007 at the Port of Long Beach. Results indicated that LNG yard tractors used about 30 percent more diesel gallon equivalents than diesel yard hostlers, had higher NOx emissions, and had an incremental cost over a diesel yard tractor of approximately $40,000.
- Advanced Yard Tractor Deployment and Eco-Fratis Drayage Truck Efficiency Project. In 2017 ETS (through LAHD) was awarded a grant from the CEC to evaluate five zero-emission battery-electric yard tractors, and 20 near-zero-yard tractors equipped with the CARB-certified Cummins Westport Low NOx engines (0.02 grams/brake horsepower-hour). The tractors will be deployed at the Everport Container Terminal and the Port has constructed electric charging stations at the terminal to support the battery-electric units. To further reduce GHG, the 20 near-zero-emission yard tractors will be fueled with renewable LNG provided by Clean Energy via a mobile LNG fueling system. This demonstration project is still underway.
- Everport Advanced Cargo Handling Equipment Demonstration Project. The LAHD was awarded a CEC grant in early 2017 to deploy three additional zero-emission battery-electric yard tractors (as well as two zero-emission battery electric top handlers). This project is expected to begin in Summer 2019 and last for 12 months.
- WBCT Yard Tractor Project. This project, funded by the Port of Los Angeles, SCAQMD, and the CEC, will deploy a wireless charging system and 10 zero-emission yard tractors at the China Shipping Terminal. The project is expected to go to the Board for approval in mid 2019.
- Port Advanced Vehicle Electrification project. A CEC program at the Port of Long Beach's Pier T terminal includes installation of electrical infrastructure to

support the future deployment of battery-electric yard tractors and forklifts. The main goal of the CEC grant projects is to determine the long-term feasibility of zero- and near-zero-emission yard tractors.

- Zero-Emissions Terminal Equipment Transition Project. The Port of Long Beach and Southern California Edison have initiated a project to evaluate a range of advanced-technology CHE. The yard tractor component of the project is deploying 12 electric-powered yard tractors at two POLB terminals, supported by an automated smart charging system, in a demonstration project. The project kicked off in late 2017 and in-use evaluations will likely take place in 2019, as 2018 was spent finalizing agreements and designing, ordering, and installing project components. This project, too, is intended to evaluate the operational feasibility of battery-electric yard tractors in real-world duty cycles.
- START Program. The Port of Long Beach and CARB have initiated testing of 33 zero-emissions yard tractors at the Pier C terminal, one of the nation's largest deployments at a single terminal. This project has included the installation of charging infrastructure at the terminal.

These examples illustrate the magnitude of the efforts that the developers, users, and supporters of zero- and near-zero-emission yard tractors are making to bring the technology to the market. Each project reveals issues and challenges that need to be addressed before mitigation requiring use of zero-emissions technology can be deemed feasible as a mitigation measure.

Current Status of Yard Tractor Technology: The Ports' review concluded that zero-emission fuel cell, near-zero-emission hybrid, and near-zero-emission diesel technologies for yard tractors have not progressed enough to be considered commercially available (Tetra Tech/GNA, 2019b). Those technologies are in the late technology development or early demonstration phases and are not expected to be ready for operational deployment by 2021. Accordingly, the review did not consider those technologies any further, and the LAHD considers that they are too far from being feasible to be considered for the Revised Project.

The report determined that both zero-emission battery-electric and near-zero-emission natural gas (CNG) technology for yard tractors are commercially and technically viable. Multiple OEMs are offering both technologies in "early commercial" product launches (there are still unresolved issues associated with production capability and end-user interest), and both technologies have undergone enough testing and demonstration of full-scale prototypes to verify their ability to meet basic performance criteria.

However, the report's authors caution that both technologies "need significantly more operational time in real-world CHE service at ports" before they can be considered to have been proven to work in their final forms and under expected conditions, i.e., to be operationally feasible. A number of factors influence operational feasibility, including endurance requirements, space constraints for operation and fueling, speed and power requirements, and infrastructure needs. The report compared three battery-electric models and one LNG model to the standard diesel yard tractor. It found that the LNG yard tractor (Capacity's TJ9000 model) appears to be fully comparable to the diesel standard in terms of endurance and fuel capacity, meaning that it is operationally feasible. The battery-electric models could handle a standard 20-hour, two-shift operation if they could be charged for 45 minutes between shifts, but only two (BYD's 8Y and Kalmar's T2E) were able to handle two shifts without inter-shift charging, and then only marginally; the Orange EV tractor could not get through two shifts without a charge. None of the battery-electric models could handle a three-shift operation, and only BYD's 8Y model could handle an extended two-shift operation. The report also pointed out that the heavy use required of yard tractors in marine terminals would rapidly degrade their batteries, thereby shortening their endurance and overall service lives, and suggested that the ongoing demonstration projects may provide more information on that issue. In addition, it is not yet clear that inter-shift charging can actually provide adequate power, given the current charging system capabilities. Finally, the report concludes that the BYD and Kalmar battery-electric models and the Capacity LNG model have adequate dealer resources to support their specialized maintenance and parts requirements.

With respect to economic workability, both yard tractor technologies are substantially more expensive to purchase (assuming no incentives) than the diesel standard: half again as much for the LNG tractor and three times as much for the battery-electric models. Relative fuel and maintenance costs are unknown at this time because neither technology has accumulated enough operational hours for a meaningful determination. The total cost of ownership of the two technologies, with incentives, is estimated to be comparable to the cost of the standard diesel tractor and could even, depending on electric rates, be somewhat lower in the case of battery-electric units. However, the availability and duration of incentives is very uncertain, and without the very substantial incentives currently in place battery-electric units could cost almost 50% more than diesel technology units over a seven-year service life.

Overall, the report concluded that "natural gas yard tractors are currently the only ZE or NZE fuel-technology platform likely to achieve [marine terminal operator] endurance requirements," although that needs to be proven in the ongoing revenue service demonstrations (i.e., the CEC/Everport project summarized above). The battery-electric models cannot reliably complete two shifts between charging events and may not be able to perform adequately even with an inter-shift charge. Furthermore, the service network for battery-electric technology needs to expand in order to ensure reliable support. The report also considers the substantial charging infrastructure that needs to be installed at a marine terminal to support a large-scale battery-electric deployment, a factor that would involve considerable capital costs (at least $150,000 per charging spot) and could require more space than is currently devoted to yard tractor storage and fueling. The report also points out that the optimal type and configuration of charging infrastructure has still not been determined; in addition, in 2016 the LAHD estimated that installing electric infrastructure for yard tractors at the CS Terminal would cost approximately $55 million. Finally, the report calculates that conversion to battery-electric yard tractors could triple a terminal's power demand, which would require that SCE and LADWP undertake substantial upgrades to their distribution systems.

The report's authors point out that the limited scale and duration of demonstrations thus far means that marine terminal operators do not have much operational experience with the newest zero- and near-zero-emissions CHE platforms and are not likely to be comfortable with a large-scale conversion of their fleets. However, they suggest that because a number of larger-scale demonstration projects are getting underway, the terminal operators are likely to feel more comfortable with those technologies within a few years and be ready to adopt them. Accordingly, both technologies may be ready for operational deployment by approximately 2021, but only if major OEM and government support continues and marine terminal operators do, in fact, gain sufficient experience with and confidence in those technologies to contemplate fleet conversions.

Gantry Cranes: Container terminals use mobile gantry cranes for managing stacks of intermodal containers within the terminal. There are four basic types of such cranes in use in marine terminals: diesel-powered rubber-tired gantry cranes (RTGs), electric-powered RTGs (ERTGs), hybrid diesel-electric RTGs, and rail-mounted gantry cranes (RMGs), which are electric-powered. A fifth type, hydrogen fuel-cell RTGs, is not being manufactured or sold at this time, according to Tetra Tech/GNA (2019b), and is not expected to be commercially or technically viable in the foreseeable future.

Diesel-powered RTGs are the standard technology in container terminals, comprising all but 14 of the 169 RTGs in use in the San Pedro Bay marine terminals (Tetra Tech/GNA 2019b). They can move readily between stacks of containers, have substantial lifting capacity, and are adaptable to a variety of container yard configurations. The diesel engines actually drive generators that power the electric hoist motors, much like the arrangement in railroad locomotives.

<u>All-Electric RTGs:</u> ERTGs run on electric power from either a grid connection via a bus bar, overhead conductor, or cable reel, or from a rechargeable battery pack; as of late 2018 the grid-connected configuration was the more mature technology (Tetra Tech/GNA, 2019b). Most grid-connected models include a small diesel engine for moving between rows of stacked containers (some prototype models include a battery system to power such moves). Some manufacturers offer kits to convert RTGs to ERTGs or hybrid RTGs (see below). ERTGs are a fully mature technology, commonly used in Europe, Asia, and Mexico, and offered by several OEMs (Tetra Tech/GNA, 2019b).

ERTG systems require fixed electrical infrastructure, which adds a considerable capital cost to their deployment (in 2016 LAHD estimated the cost of electric infrastructure for 12 ERTGs at the CS Terminal to be $13 million), and they make the layout and operation of the container stacking area highly inflexible. These features can make them difficult to implement on existing container terminals, since the installation of ERTGs can require extensive terminal modifications. Accordingly, ERTG systems are best suited for master-planned terminals where the physical layout and operations are specifically designed to accommodate the ERTG system, although, as the example below shows, converting an existing terminal from RTGs to ERTGs is possible given a favorable existing configuration. Tetra Tech/GNA (2019b) estimate that the high purchase price and infrastructure costs of ERTGs more than offset lower power and maintenance costs, making the total cost to own and operate ERTGs approximately 10 to 20 percent higher than those of a conventional diesel RTG.

One demonstration project for ERTGs is underway in the San Pedro Bay ports: the Zero-Emissions Terminal Equipment Transition Project at the Port of Long Beach is converting nine RTGs at the SSA Terminal on Pier J to full electric power (Port of Los Angeles and Port of Long Beach, 2018). The project kicked off in late 2017 and includes installing the electrical infrastructure needed to provide power to the cranes. In-use evaluations will likely take place in 2019, as 2018 was spent designing, ordering, and installing project components.

The Port's recent third-party technology review (Tetra Tech/GNA 2019b) concluded that ERTGs are commercially available and have few operational feasibility issues. Remaining issues regarding the availability of infrastructure and economic workability in the San Pedro Bay marine terminals are expected to be resolved by ongoing and planned demonstration projects, but overall the technology is considered feasible for appropriately configured terminals. The Revised Project includes the conversion of four RTGs to

ERTGs (MM AQ-17) because one area of the CS Terminal is suitable for the deployment of ERTGs.

Rail-Mounted Gantry Cranes (RMG): RMGs, which are powered entirely by electricity provided by a fixed infrastructure, sacrifice the mobility of their diesel counterparts and even of ERTGs because each RMG is restricted to its set of rails; however, RMGs have lower long-term operating costs, and because they run entirely on electricity, they provide substantial environmental benefits. RMG systems involve similar financial and operational considerations to those discussed above for ERTGs. Additionally, the capital investment and scale of construction required to develop an RMG system are greater than for an ERTG system, given the need to install rails along the container stacks. As with ERTG systems, RMG systems are best suited for master-planned terminals where the physical layout and operations are specifically designed to accommodate the RMG system.

Hybrid RTGs: According to the Port's recent technology review (Tetra Tech/GNA 2019b), at least three manufacturers offer RTG systems that use a diesel-electric hybrid advanced energy capture and battery storage system. The technology is considered fully mature, being widely deployed, including at several San Pedro Bay terminals. Hybrid RTGs have substantial fuel savings compared to diesel RTGs (a second-generation EcoCrane™ at the Port of Los Angeles' West Basin Container Terminal demonstrated a 56 percent fuel economy improvement), and those savings more than offset the higher purchase price, especially since there are no associated infrastructure costs. Because hybrids run on diesel fuel, they are supported by the existing infrastructure in the terminal, and converting an existing RTG unit from diesel to hybrid technology is relatively straightforward, although at over $600,000 per unit it is costly (a recent LAHD grant application to US EPA's Clean Diesel Funding Assistance Program budgeted $630,000 to convert one diesel RTG to hybrid technology). Accordingly, terminals can convert their operations to hybrid technology without the disruption and costs of an infrastructure construction project. Given these factors, the LAHD considers hybrid RTGs to be a feasible technology and, in fact, MM AQ-17 of the Revised Project requires that existing diesel-powered RTGs at the CS Terminal be converted to hybrid units (except the four that are to be converted to ERTGs).

Top Handlers/Top Picks: Container terminals use various types of mobile cranes to lift containers on and off of stacks, trucks chassis, and rail cars. Cranes of the top handler/top pick configuration (i.e., grasping the container by its top corners) are by far the most common type in use in the San Pedro Bay marine terminals, which use a total of approximately 400 units (Tetra Tech/GNA, 2019b). Reach stackers, which grasp the container only by its two near corners, are rarely used because they take up too much space for maneuvering and they cannot reach the top of the container stacks. Top handlers are typically powered by a diesel engine of 250-350 horsepower.

Several projects at the two ports are or will be testing prototype battery-electric top handlers, including one with a hydrogen fuel cell range extender. The projects include the Everport Advanced Cargo-Handling Equipment Demonstration Project at the Port of Los Angeles and the C-PORT, START, and PAVE projects at the Port of Long Beach. Results of these demonstrations will indicate whether the current top handler zero-emissions technology is capable of performing at the activity levels needed in modern container terminals. As in the case of yard tractors, battery-electric top handlers require substantial electrical charging infrastructure, which must be installed at each terminal (in

2016 the LAHD estimated that electrical infrastructure for top handlers at the CS Terminal would cost approximately $20 million to install).

The Port's recent technology review (Tetra Tech/GNA, 2019b) found that zero- and near-zero-emissions top handlers are not yet in commercial production and that the technologies did not achieve the basic considerations of commercial and technical viability needed for further consideration. Given their lack of demonstrated ability to perform as required in marine terminals, the LAHD concludes that zero- and near-zero-emissions top handlers are not yet feasible technologies.

Forklifts: Container terminals use forklifts to move empty containers, chassis, and other cargo-related items. About a third of the 750 forklifts used in San Pedro Bay terminals are large-capacity units powered by diesel; most of the rest are powered by natural gas or electricity (Tetra Tech/GNA, 2019b). WBCT operates several 5-ton and 18-ton forklifts at the CS Terminal, some fueled with diesel, most with LPG. Unlike yard tractors, top handlers, and RTGs, forklifts are typically used only a few hours a day, and thus have a much lighter duty cycle than other CHE.

Numerous low-capacity and medium-capacity zero- and near-zero-emissions forklifts are commercially available, and a recent review commissioned by the Port (GNA, 2019) concluded that zero-emission technology for small forklifts is fully mature. Small battery-electric forklifts can be successfully employed in marine terminals because charging does not require extensive, specialized infrastructure and charging times do not conflict with duty-cycle requirements. Accordingly, the Revised Project includes a provision that all 5-ton forklifts at the CS Terminal older than the 2011 model year (which is all but one of the units currently in service) must be replaced by zero-emission units.

The CS Terminal also employs several larger (18-ton-capacity) forklifts. The Port's CHE technology review did not identify any commercially available zero- or near-zero-emissions units with that capacity (Tetra Tech/GNA, 2019b). A demonstration project for a zero-emission high-tonnage forklift will take place at the Port of Los Angeles's Pasha Terminal in 2019, but at this time the LAHD concludes that there is no feasible zero- or near-zero-emissions technology for 18-ton forklifts.

Technologies Suggested by Comments

Two commenters, Citizens for a Safe Environment (CFASE) and the Natural Resources Defense Council (NRDC), suggested other zero- and near-zero-emission technologies for consideration as mitigation for impacts of the Revised Project.

CFASE included with its comment letter an attachment that it represented as a survey of commercially available zero- or near-zero-emissions equipment. It lists over 400 models of equipment in various categories related to transportation, construction, and goods movement. Comment CFASE-4 referred to that equipment as "available, feasible technology mitigation which can be incorporated into the SEIR." Responses to Comments CFASE-10 and CFASE-12 describe the results of a third-party review of CFASE's list (GNA, 2019), which determined that the majority of the listed models are either irrelevant or unsuited to container terminal operations (e.g., light-duty trucks and vans, construction equipment, passenger trains, school buses, taxis, and fire and refuse trucks). The results of GNA's analysis of the remaining equipment are presented in those responses to comments.

CFASE also, in Comment CFASE-20, mentioned zero-emissions goods movement systems based on magnetic levitation and similar technologies. Those systems would move containers between the marine terminals and local destinations such as near-dock railyards, major warehouse concentrations, and/or an inland port. Response to Comment CFASE-20 and Master Response 3 describe in detail the reasons why such a system is both technologically infeasible at this time and not appropriate mitigation for an individual terminal project.

NRDC, in comment NRDC-27, suggested that the CS Terminal should be converted to a fully electrified model, such as the Port of Los Angeles' TraPac Terminal and the Port of Long Beach's Middle Harbor Terminal. Response to Comment NRDC-27 describes how such a concept would be infeasible as mitigation for the Revised Project's impacts because of the scale of the terminal redevelopment project it would require (LAHD estimates the construction cost of such a redevelopment at $396 million, which does not include the terminal operator's costs associated with partial shutdown of the terminal during the three-to-five-year construction project or the capital costs of the new cargo handling equipment).

Conclusion

The LAHD, working collaboratively with Port tenants and other stakeholders, is committed to expanded development and testing of zero-emission technologies, identification of new strategic funding opportunities to support these expanded activities, and planning for long-term infrastructure development to sustain ongoing programs, all while ensuring competitiveness among the maritime goods movement businesses.

As noted above, zero-emission CHE (including drayage trucks, yard tractors, and gantry cranes) requires further evaluation to establish the technical viability, operational reliability, and ability to attract participation from established original equipment manufacturers that will lower acquisition and maintenance costs and allow this equipment to become commercially viable. The Revised Project's lease measures LM AQ-1 and LM AQ-3 were specifically established to integrate these systems into terminal operations when commercial viability is achieved and operational feasibility is ensured. At this time, however, LAHD cannot either mandate zero-emission technologies as mitigation measures for the Revised Project or take credit for implementing such measures.

2.3.1.3 Master Response 3: Port-wide Emission Reduction Programs

Several comments suggested mitigation measures that are impractical to apply on a terminal-by-terminal basis, but instead are only feasibly addressed on a port-wide basis. Others requested that the LAHD implement additional mitigation beyond what current regulations and the San Pedro Bay Ports Clean Air Action Plan (CAAP) would accomplish. This Master Response addresses those comments.

A mitigation measure must have an essential connection with the significant impact of the project, and the measure must be roughly proportional to the project impact to be mitigated (State CEQA Guidelines Section 15126.4(a)(4)(A)-(B)). When addressing a wide-spread regional impact such as transportation, climate change or air quality, lead agencies cannot require project applicants to shoulder more than their fair share of the costs of mitigation. CEQA further does not require that a project be modified or mitigated to improve upon existing environmental conditions. (See In re Bay-Delta Programmatic Envtl. Impact Report Coordinated Proceedings (2008) 43 Cal.4th 1143, 1168 [“[E]xisting environmental problems . . . that would continue to exist even if there were no [project] . . . are part of the baseline conditions rather than [project]-generated environmental impacts . . ..”].)

Operation of a container terminal includes a number of activities conducted by third parties – i.e., entities that are not under the control of the terminal operator or the terminal lessee – and that are provided on a port-wide basis to many terminals. Key examples are tugboat escort and bunkering for the container vessels, drayage trucking for delivery of containers, and locomotive activities associated with on-dock intermodal facilities. Suggested mitigation measures that are infeasible to apply on a terminal-by-terminal basis relate to those third-party activities and include:

- requiring the use of cleaner harbor craft,
- requiring zero-emission drayage trucks,
- requiring zero-emission rail locomotives,
- installing zero-emission container movement systems (ZECMS), and
- requiring that only the cleanest containerships service the CS Terminal.

Harbor craft: In the case of tugboats (included in the source category “harbor craft”), the escort and bunkering services they provide are contracted for by the vessel operators (not the terminal operators) and provided by independent tugboat and bunkering companies, who make the decisions on which tugboats will provide which services. Mitigation requiring only a certain type of harbor craft to service a container terminal is infeasible because the terminal has no legal or contractual mechanism for excluding non-compliant harbor craft; in fact, tugboats often do not enter the terminal’s leasehold area, but instead operate on Port-owned waters. There are currently two diesel-electric hybrid tugboats in operation in the port complex, the Port of Long Beach has embarked upon a test of an electric-drive tugboat under its CARB-funded START Project, and both ports are partnering with Nett Technologies and Pacific Tugboat Services to develop and test an aftertreatment system for harbor craft (Port of Los Angeles and Port of Long Beach, 2019).

Drayage Trucks: Drayage trucking is described in detail in the report “Assessment of the Feasibility of Requiring Alternative-Technology Drayage Trucks at Individual Container Terminals” (referenced as LAHD [2017] in the Recirculated DSEIR and hereinafter “Drayage Truck Study”), but a brief summary is provided here. The major participants in the drayage industry are drayage companies, beneficial cargo owners, various logistics providers, and ocean carriers. Marine terminals, the Port’s leaseholders, are not participants in the drayage industry, as they neither operate drayage trucks nor arrange for drayage services. Drayage companies operate the tractor trucks that haul containers and chassis to and from marine terminals, warehouses, transloaders, railyards, and storage depots. Cargo owners, ocean carriers, and their logistics providers arrange with drayage companies for the drayage of the cargo that they own or for which they have taken responsibility. None of those entities is a tenant of the Port of Los Angeles. Mitigation aimed at restricting drayage at a particular terminal to a particular type of truck would require a container terminal to turn away all trucks except those in the specified category.

Through the Clean Truck Program (CTP), the Ports are committed to converting the ports-wide drayage fleet to near-zero-emissions status and ultimately to zero-emissions status. The proposed CTP update contains the following provisions to that effect:

- Beginning October 1, 2018, new trucks entering the Ports' Drayage Truck Registry (PDTR) must have a 2014 engine model year (MY) or newer. Existing trucks already registered in the PDTR can continue to operate.
- Beginning in early 2020, following promulgation of the state's near-zero-emission heavy-duty engine standard, all heavy-duty trucks will be charged a rate to enter the ports' terminals, with exemptions for trucks that are certified to meet this near-zero standard or better.
- Starting in 2023, or when the state's near-zero-emission heavy-duty engine standard is required for new truck engine manufacturers, new trucks entering the PDTR must have engines that meet this near-zero emissions standard or better. Existing trucks already registered in the PDTR can continue to operate.
- Modify the truck rate so that by 2035 only trucks that are certified to meet zero emissions will be exempt from the rate.

This update will establish the Ports' approach to accelerating the transition to near-zero-emission trucks in the early years, and zero-emission trucks in the later years, and will provide a long-term schedule for the drayage industry to budget and plan for the eventual transition to zero emissions. Please see the 2017 CAAP for more detail.

Locomotives: With respect to locomotives, none of the Port's tenants, including the CS Terminal, has any authority over either Pacific Harbor Line (PHL, the short-line providing switching and dispatching services within the port complex) locomotives or the Class 1 railroads (BNSF and UP, which haul most of the rail cars in and out of the Port), and cannot dictate their operating practices or equipment. The Port has a certain amount of control over locomotives operated by PHL because PHL is under contract to the two ports. That authority is pre-empted to some extent, however, by federal regulatory authority. The Port has no control over the Class 1s because interstate commerce provisions and the Alameda Corridor Use and Operating Agreement pre-empt the Port's authority; emissions reductions involving Class 1 locomotives are the result of federal regulations, supplemented by agreements between the railroads and the State of California. In these circumstances, it is not legally or practically feasible to mitigate project-specific impacts via measures that address locomotive types or movements.

However, the Ports have worked with PHL to reduce emissions from PHL's switching operations on a port-wide basis. As described in the 2017 CAAP, PHL is the cleanest rail company in the country and has started to introduce locomotives with the lowest-emitting Tier 4 engines. The Ports, in partnership with CARB, are funding the development and demonstration of a zero-emission (battery-electric) locomotive manufactured by VeRail for use in switching operations within the Port complex (Port of Los Angeles and Port of Long Beach, 2019). That project has been approved by CARB and the LAHD, system re-design (from the initial CNG concept) has begun, and testing is expected to take place in late 2019. Future efforts by the Ports, PHL, industry, and the regulatory agencies will continue the trend towards near-zero and zero emissions from PHL operations.

ZECMS: Another general concept that has been suggested as mitigation is the zero-emission container movement system (ZECMS), in which electrified monorail-type systems or systems based on existing railroad tracks, would move containers between the marine terminals and inland destinations. Depending on the proponent, destinations could include the near-dock intermodal railyards in Carson (the ICTF and, if it is constructed, the SCIG), the downtown railyards, or even major distribution warehouses throughput the region. A number of propulsive technologies have been proposed, but most would utilize purpose-built, largely elevated rights of way through the existing landscape. The construction of such a system is not feasible for consideration as mitigation for the impacts of the Revised Project for several reasons.

First, ZECMS require very large capital investments and have extensive geographical coverage, and thus are disproportionate to the impacts of an individual project. In 2008, EMMI Logistics estimated the building cost for a complete MagLev system between the Ports and the ICTF at $161million (American Maglev Inc., 2008), and the cost of building it to a proposed container sorting facility in Bell at another $700 million; the recent experience of the high-speed rail project suggests that these are underestimates.

Second, although LAHD could authorize additional loading tracks at on-dock yards within the Port boundaries, the alternative rail transportation system would have to extend well beyond the on-dock yards to areas beyond the Port. Additionally, the project applicant/tenant has no means to implement such system-wide transportation improvements nor does the applicant/tenant or Port have any jurisdiction over such systems.

Third, such a measure would require a substantial reorganization of the regional goods movement system, besides having widespread construction-related impacts of its own. A zero-emissions rail transportation system may be implemented by the goods movement industry, including the Ports, in the future if it proves to be technologically and operationally feasible, practicable to build (considering jurisdictional, environmental, cost, and land use issues), and economically feasible to operate.

Fourth, there is no guarantee that any of the technologies involved is feasible. In 2006 the Ports solicited proposals for zero-emissions container movement systems from potential vendors and commissioned a third-party evaluation of the resulting 13 concepts (see the "Roadmap for Moving Forward with Zero Emission Technologies at the Ports of Los Angeles and Long Beach" [POLB and POLA, 2011]). The evaluation concluded that there were no zero-emissions solutions for locomotives and rail transportation as a whole that could be implemented in the near term. A second solicitation in 2009 resulted in seven responses, and the evaluation report stated that the third-party panel of experts did not believe that any of the proposed concepts was sufficiently mature to warrant the commitment of port and public resources to a full-scale operational deployment. Although some additional effort was devoted to developing a technology demonstration, none of the efforts have progressed. Given the lack of further interest by potential vendors in zero-emission container movement systems, even at the pilot project level, the Port has concluded that the state of the technology has not advanced since the 2008 – 2011 efforts, and the ZECMS concept is still not feasible. However, the Ports continue to be engaged in the identification, evaluation, and demonstration of regional-scale zero-emission rail options, as set forth in the 2017 CAAP.

Vessel Re-Deployment: Re-deploying the cleanest cargo vessels to the Port has been suggested as a mitigation measure. However, because vessel deployment decisions are solely the responsibility of the shipping lines and involve international commerce, neither the Port nor the marine terminals have the ability to mandate the deployment of the cleanest vessels to San Pedro Bay. The Ports' most promising approach to the issue is through incentives, and they are pursuing the deployment of the cleanest cargo vessels to San Pedro Bay through Los Angeles' Environmental Ship Index and Long Beach's Green Ship Incentive Program. As a result, in 2018, nearly one in three vessel calls to the Port of Los Angeles qualified for the Tier 2 incentives. In addition, the Ports continue to work with vessel operators and designers and other ports to promote the use of emissions control technologies, clean fuels, and additional incentive and variable-rate strategies to reduce vessel emissions.

On a port-wide basis, the CAAP guides the efforts of the two ports to develop and implement feasible emissions reduction programs. The Ports of Los Angeles and Long Beach originally developed the CAAP in 2006 with input from a number of stakeholders, including the USEPA, CARB, and SCAQMD. The CAAP was updated in 2010, and underwent a revision in 2017, with the 2017 CAAP Update adopted in November 2017. The CAAP has in some cases achieved emission reductions of criteria pollutants, toxic air contaminants, and GHG in excess of those required by existing federal and state regulations, and in others has accelerated achievement of the reductions anticipated in the regulations. Through the CAAP and the associated programs, emission reduction technologies have been tested and are being developed to produce commercially viable mitigation for Port emission sources. The CAAP and updates, as well as accomplishments of Port-wide emission reduction programs can be reviewed at:

- https://www.portoflosangeles.org/environment/caap.asp
- https://www.portoflosangeles.org/environment/ogv.asp
- https://www.portoflosangeles.org/environment/progress/initiatives/technology-advancement-program/.

The CAAP will continue to push technological improvements for emission reductions at a pace faster than regulations alone. However, the Ports cannot yet rely on any programs in this update to be available and appropriate for claiming additional emission reductions in the Recirculated DSEIR. As technologies become technologically feasible, economically viable, and commercially available in the region, they will become requirements at the Port of Los Angeles as stated in lease measure LM AQ-1: Cleanest Available Cargo Handling Equipment and LM AQ-3: Demonstration of Zero Emissions Equipment (Recirculated DSEIR, Section 2.5.2.2).

2.3.1.4 Master Response 4: Non-Compliance with the Original FEIR MMs

Several comments requested that the LAHD address past non-compliance with the mitigation measures in 2008 EIS/EIR. This response describes the background of the Proposed Project and the CEQA requirements for consideration of past activities.

Sections 1.2.3 and 1.2.4 of the Recirculated DSEIR describe in detail the background of the Revised Project, including the status of the lease with China Shipping and the reasons for the non-compliance with some mitigation measures. As explained in Section 1.2.4.1, the 2008 EIS/EIR included an aggressive suite of 52 mitigation measures, many of which had never been attempted anywhere in the world. Despite the far-reaching nature of some of these measures, LAHD believed, at the time, that these measures were realistic and could be implemented at the CS Terminal within a reasonable timeframe. However, LAHD made this determination without the benefit of any evidence or feedback from the operator, as China Shipping did not participate in the 2008 EIS/EIR process and did not provide any information to LAHD on whether the measures could be feasibly and effectively implemented. It was not until later, when LAHD sought to amend the lease with the new mitigation measures, that China Shipping first informed LAHD that technological, economic, and operational challenges that made implementation of certain mitigation measures, under the terms and timeframes required, operationally or economically infeasible. Section 1.2.4.2 summarizes the issues raised by China Shipping with respect to the feasibility of these mitigation measures. LAHD has been working to identify ways to revise these mitigation measures to make them feasible so that they can be implemented and provide the intended environmental benefits. The Recirculated EIR identified and analyzes the potential environmental impacts of possible changes to these mitigation measures. This is the required process under CEQA for addressing the need to revisit mitigation measures, and it allowed LAHD to analyze all issues thoroughly and carefully and to propose mitigation measures that can be successfully implemented. If it is determined that changes to existing mitigation measures are recommended on the basis of the Recirculated DSEIR, the Board of Harbor Commissioners will consider amending the lease for operations at Berths 97-109 to include those measures.

LAHD acknowledges comments that suggest that action should have been taken against China Shipping to address the non-compliance with the original mitigation measures. However, as explained in Section 1.2.3.2 of the Recirculated DSEIR, the ASJ allowed for China Shipping to continue operating the terminal under the existing lease (Permit No. 999) signed in 2001. While the lease was supposed to have been amended after certification of the 2008 EIR, "[t]he preparation of an EIR is not generally the appropriate forum for determining the nature and consequences of prior conduct of a project applicant . . .." (*Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 371.) Any action by LAHD to enforce mitigation measures (past or future), or other lease provisions, would be a separate proceeding outside the scope of this EIR process.

2.3.1.5 Master Response 5: Comparative Emissions

Several comments refer to "excess emissions," "foregone emissions," "future excess emissions," and similar terms, and some of those comments allege that the Recirculated DSEIR did not disclose those emissions. Note that the term "excess emissions" is not employed or defined in the CEQA statute or guidelines, and the SEIR does not use that term in its analysis. In these responses, LAHD assumes the terms "excess emissions" and "foregone emissions" refer to the difference between the operational emissions in past and future years if all 2008 EIR mitigations had been deployed (identified in the Recirculated DSEIR as the "FEIR Mitigated" scenario) and the actual emissions that occurred in the past with partial implementation of 2008 EIS/EIR mitigation measures, and would occur in the future, under the Revised Project.

LAHD disagrees with the comments alleging that the Recirculated DSEIR did not disclose these emissions. Please see responses to comments SCAQMD-28, NRDC-6 through NRDC-13, and NRDC-17. A comparison of emissions between the Revised Project and FEIR Mitigated scenarios yields the figures that the commenters are referring to, and those comparative emissions were presented, for informational purposes only, in Table 3.1-11 in the Recirculated DSEIR (page 3.1-60 of Section 3.1) for the peak-day emissions for past (2012, 2014, 2018) and future (2023-2030, 203, 2045) years. Analogously, Appendix B1 of the Recirculated DSEIR presents the annual emissions for each scenario both as a total figure and by source category, for every analysis year and each scenario. The subtraction of total yearly emissions from tables B1-669 and B1-661, for the Revised Project and the FEIR Mitigated Scenario, respectively, represents the comparative emissions on an annual basis. For the reader's convenience, and for informational purposes only, Table MR 5-1, showing the difference between the annual emissions for each scenario (Revised Project and FEIR Mitigated), is presented below.

Furthermore, as shown in Table 3.1-11, the incremental difference between FEIR Mitigated Scenario emissions and past actual emissions (on the one hand) and between FEIR Mitigated emissions and future emissions of the Revised Project (on the other hand) is often, although not always, considerably smaller than the incremental difference between 2008 Actual Baseline emissions and past/future emissions of the Revised Project. Table 3.1-11 shows that peak-day VOC emissions in 2014 under the Revised Project were 328 pounds per day higher than the 2008 Actual Baseline, and that peak-day VOC emissions under the FEIR Mitigated Scenario would have been 299 pounds per day higher than the 2008 Actual Baseline. The "differences between scenarios" column of that table therefore discloses that peak-day VOC emissions in 2014 under the Revised Project were only 29 pounds per day higher than under the FEIR Mitigated Scenario. Therefore, even if CEQA required comparison of the Revised Project to a fluctuating "FEIR Mitigated Scenario" baseline for purposes of impact-significance determination (which it does not), comparison to such a baseline would generally understate the impacts of the Revised Project, relative to the impacts identified and assessed for significance in the Recirculated Draft SEIR in comparison to a 2008 baseline.

With respect to comments that the Recirculated DSEIR should analyze and mitigate for the impacts of the non-compliance period, CEQA does not require that a supplemental EIR for proposed changes to a previously approved project assess mitigation to reduce or avoid impacts of the project that occurred prior to approval of the proposed change. Moreover, there is no requirement under CEQA that LAHD must provide a full public accounting of past activities at the Project site. Nonetheless, after the release of the Draft EIR for the Revised Project, several comments requested that LAHD consider the period between 2008 and 2014, when some of the mitigation measures in the 2008 EIS/EIR were not being fully implemented as required, as part of the project description. The LAHD decided to expand the analysis of the Revised Project to include this "Partial Implementation Period" as a project element and added three interim years – 2012, 2014, and 2018 – to the analysis. For informational purposes only, the Recirculated DSEIR also discloses emissions that occurred between 2008 and the present due to incomplete implementation of mitigation from the 2008 EIS/EIR (see Table 3.1-11).

Table MR 5-1. Difference between the Revised Project and the FEIR Mitigated scenario for total annual emissions (tons/year)

Pollutant	Analysis Year	Revised Project	FEIR Mitigated Case	Revised Project minus FEIR Mitigated
VOC	2012	32.88	31.07	1.81
	2014	53.09	51.79	1.3
	2018	67.27	38.26	29.01
	2023	60.08	36.69	23.38
	2030	33.79	34.50	-0.71
	2036	33.58	39.59	-6
	2045	30.00	38.93	-8.94
CO	2012	293.39	289.52	3.87
	2014	562.99	568.81	-5.82
	2018	555.71	137.29	418.41
	2023	418.72	187.73	230.99
	2030	225.17	202.30	22.87
	2036	225.34	213.29	12.06
	2045	217.54	211.17	6.36

Pollutant	Analysis Year	Revised Project	FEIR Mitigated Case	Revised Project minus FEIR Mitigated
NOx	2012	469.55	419.65	49.91
	2014	800.57	707.91	92.66
	2018	898.90	768.39	130.52
	2023	742.46	688.32	54.14
	2030	551.94	545.84	6.1
	2036	397.47	397.81	-0.34
	2045	264.89	271.49	-6.6
PM_{10}	2012	15.33	14.13	1.2
	2014	19.09	17.89	1.2
	2018	20.22	18.72	1.5
	2023	20.07	19.10	0.96
	2030	19.58	19.51	0.07
	2036	18.06	18.11	-0.05
	2045	16.73	16.86	-0.13
$PM_{2.5}$	2012	12.52	11.42	1.11
	2014	14.06	12.97	1.1
	2018	15.31	13.84	1.46
	2023	14.32	13.37	0.95
	2030	13.44	13.36	0.07
	2036	11.97	12.01	-0.04
	2045	10.69	10.80	-0.11
SOx	2012	8.65	5.45	3.2
	2014	8.42	7.88	0.54
	2018	10.74	10.53	0.21
	2023	10.00	9.52	0.48
	2030	10.10	9.60	0.5
	2036	10.02	9.51	0.51
	2045	9.93	9.42	0.51

Source: RDSEIR Appendix B1 Tables B1-661 and B1-669.

2.3.2 Responses to Comment Letters

2.3.2.1 California State Clearinghouse

STATE OF CALIFORNIA
GOVERNOR'S OFFICE *of* PLANNING AND RESEARCH

EDMUND G. BROWN JR.
GOVERNOR

KEN ALEX
DIRECTOR

November 19, 2018

Christopher Cannon
City of Los Angeles Harbor Department
425 S. Palos Verdes Street
San Pedro, CA 90731

Subject: Berth 97-109 [China Shipping] Container Terminal Project
SCH#: 2003061153

Dear Christopher Cannon:

SCH-1

The State Clearinghouse submitted the above named Supplemental EIR to selected state agencies for review. The review period closed on November 16, 2018, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 10th Street P.O. Box 3044 Sacramento, California 95812-3044
1-916-322-2318 FAX 1-916-558-3184 www.opr.ca.gov

Document Details Report
State Clearinghouse Data Base

SCH# **2003061153**
Project Title Berth 97-109 [China Shipping] Container Terminal Project
Lead Agency Los Angeles, Port of

Type **SIR** Supplemental EIR

Description The Recirculated Draft SEIR is a complete recirculation of the Draft SEIR released on June 16, 2017. The significant new information int he Recirculated Draft SEIR centers around the evaluation of the operation of the terminal from 2008-2014 under the set of mitigation measures approved in a previously certified 2008 EIR, to the extent those were implemented, and its continued operation in the future under new and/or modified mitigation measures, along with an incrementally higher cargo throughout level compared to that assumed in the 2008 EIR. The analysis examines whether potentially new significant environmental impacts or substantially more severe impacts would occur in the areas of Air Quality, Greenhouse Gases, and Ground Transportation.

Lead Agency Contact

Name Christopher Cannon
Agency City of Los Angeles Harbor Department
Phone (310) 732-3675 ***Fax***
email
Address 425 S. Palos Verdes Street
City San Pedro ***State*** CA ***Zip*** 90731

Project Location

County Los Angeles
City
Region
Lat / Long
Cross Streets Front Street and Pacific Avenue
Parcel No. 744-002-5904
Township ***Range*** ***Section*** ***Base***

Proximity to:

Highways I-110 & 47
Airports
Railways
Waterways
Schools Dodson, Barton Hill
Land Use Heavy Industrial ([Q] M3-1).

Project Issues Cumulative Effects; Other Issues; Air Quality

Reviewing Agencies Resources Agency; Department of Boating and Waterways; California Coastal Commission; Department of Fish and Wildlife, Region 5; Department of Parks and Recreation; California Highway Patrol; Caltrans, District 7; Air Resources Board; State Water Resources Control Board, Division of Water Quality; Regional Water Quality Control Board, Region 4; Department of Toxic Substances Control; Native American Heritage Commission; Public Utilities Commission; State Lands Commission; San Gabriel & Lower Los Angeles Rivers & Mountains Conservancy

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Date Received 09/28/2018 ***Start of Review*** 10/03/2018 ***End of Review*** 11/16/2018

Note: Blanks in data fields result from insufficient information provided by lead agency.

Response to Comment SCH-1

The State Clearinghouse's acknowledgement of its receipt of the Recirculated DSEIR is noted. No further response is required.

2.3.2.2 South Coast Air Quality Management District

South Coast Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 · www.aqmd.gov

SENT VIA E-MAIL & USPS: November 30, 2018
ceqacomments@portla.org
Christopher Cannon, Director
City of Los Angeles Harbor Department
Environmental Management Division
P.O. Box 151
San Pedro, CA 90731

Recirculated Draft Supplemental Environmental Impact Report (DSEIR) for the Berths 97-109 [China Shipping] Container Terminal Project (SCH No.: 2003061153)

SCAQMD-1

The South Coast Air Quality Management District (SCAQMD) staff appreciates the opportunity to comment on the above-mentioned document for the China Shipping Container Terminal Project (Project). Approved by the Los Angeles Harbor Commission (LAHC) 10 years ago, the Port of Los Angeles (Port) was committed to implementing mitigation measures that would reduce significant air quality impacts from the Project. However, in 2017, the Port released the original DSEIR proposing to revise 10 of 52 mitigation measures that were approved for the Project in 2008, six of which were directly targeted towards reducing significant air quality impacts. SCAQMD staff has consistently expressed concern, including in our September 29, 2017 comment letter[1], regarding the Port's failure to enforce the mitigation measures from the 2008 EIR, as well as other concerns regarding the analysis. Now, with this Recirculated DSEIR, the inadequate mitigation and underestimation of impacts remain a serious concern and a violation of CEQA.

The Recirculated DSEIR acknowledges the Project results in significant regional air quality impacts[2]; exceeds localized ambient air pollutant concentrations[3]; and results in exposure to significant levels of toxic air contaminants (TAC)[4]. The Recirculated DSEIR is severely lacking in enforceable mitigation measures and fails to make a commitment towards the adoption of all feasible measures. SCAQMD staff is concerned that the Project has been allowed to continue to operate in flagrant violation of the conditions from the 2008 Project and that any delay in certifying this Recirculated DSEIR continues to exacerbate the problem. At the same time, SCAQMD staff is concerned that this Recirculated DSEIR, if certified as it is, will permanently result in a weakening of the Port's commitment and CEQA obligation to implement all feasible measures to mitigate air quality impacts from the Project. As mentioned in our previous comment letter, SCAQMD staff seek a Project that ensures implementation of all feasible

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[1] South Coast Air Quality Management District. September 29, 2017. *Staff Comments*. Accessed at: http://www.aqmd.gov/docs/default-source/ceqa/comment-letters/2017/dseir-chinashipping-092917.pdf

[2] Criteria Pollutants: CO 2012-2023, NOx 2014-2036, VOC 2014-2045

[3] Ambient Concentrations: NO_2- Federal one-hour 2014-2018, state one-hour 2014, PM10- annual and 24-hour 2014-2045

[4] Health Risk: 25.4 in a million, 25.9 in a million, and 21.4 in a million, for residential, occupational, and other sensitive receptors, respectively.

SCAQMD-1 measures, as required by CEQA, such as zero or near-zero emission trucks and cargo handling equipment to mitigate significant air quality impacts. More details are discussed as follows.

SCAQMD-2 As a preliminary matter, the Port must explain how the lease will be amended to incorporate adopted mitigation measures. The Recirculated DSEIR explains that many of the mitigation measures are triggered by the "effective date of a new lease amendment", which is anticipated around 2019, but the existing lease, Permit No. 999, does not terminate until 2045. The Port acknowledged that many of the 2008 mitigation measures were not implemented because China Shipping refused to amend Permit No. 999 to incorporate the requirements. The Port does not explain the legal mechanism for now requiring an amendment to Permit No. 999, and without an ability to require a lease amendment, the Port may again be unable to fully implement adopted mitigation. CEQA requires that mitigation measures must be "required, in, or incorporated into, the project." (*Federation of Hillside & Canyon Associations v. City of Los Angeles* (2000) 83 Cal.App.4th 1252, 1260 citing Pub. Res. Code § 21081). The requirement for enforceability ensures "that feasible mitigation measures will actually be implemented as a condition of development, and not merely adopted and then neglected or disregarded." *Id.* at 1261. Without assurance that the Port can require the mitigation measures be put into this lease, or another enforceable mechanism, the Port is unable to meet this standard.

SCAQMD-3 The China Shipping Container Terminal Project is a major project for the Port, with significant air quality impacts to the nearby environmental justice communities and the region as a whole. As shown in Table 3.1-9 and 3.1-10 of the Recirculated DSEIR, the 2014 NOx emissions are substantially higher (1,200 lbs/day) than emission estimates from the 2008 Project largely due to a failure to implement mitigation measures. The Recirculated DSEIR should take more aggressive actions to accelerate zero-emission vehicles and equipment that are currently and/or expected to be commercially available during the life of the Project, instead of relaxing and removing key air quality mitigation measures with no replacement measures, resulting in even less mitigation than the 2008 EIR. This is in spite of major technological advances since the 2008 EIR. As the lead agency, the Port must adopt all feasible mitigation measures that can substantially lessen the project's significant impacts. (Pub. Res. Code § 21002, CEQA Guidelines § 15002(a)(3).)

SCAQMD-4 Removal of mitigation, and failure to provide adequate substitute measures, will increase emissions in and around the Port and delay the implementation of zero or near-zero emission trucks and equipment at China Shipping, and potentially throughout the Port. The critical attainment date for federal ozone ambient air quality standard (AAQS) of 2023 is quickly approaching and the efforts of the Port are vital for SCAQMD to fulfill the goals set-forth in the AQMP and our obligation under the Clean Air Act (CAA). If NOx emission levels continue to increase, the Project will potentially hinder the SCAQMD's ability to meet 2023 federal ozone AAQS. SCAQMD is required to attain the federal and state AAQS as expeditiously as practicable, and the failure to do so will result in negative repercussions, including strict implementation of contingency measures and backstop measures affecting the entire region, especially the ports. Therefore, the mitigation measures associated with the Project play a vital role in reducing emissions through timely implementation of the cleanest available technology and should be aimed at decreasing future emissions from goods movement.

Furthermore, the removal of key air quality mitigation measures from the 2008 EIR, and the failure to implement adequate substitute measures, is inconsistent with the Port's overall

SCAQMD-4

objectives towards emissions reductions in the 2017 Final Clean Air Action Plan (CAAP) Update. Also, reducing health risks from individual port development project's by establishing an incremental cancer risk of 10 in a million was one of the original and fundamental objectives of the CAAP[5]. Therefore, the Port must do more to mitigate the air quality and health risks impacts from the Revised Project, to the maximum extent that is feasible and practicable. Specifically, the Port should keep the commitment to zero and near-zero emission trucks and equipment, and pursue integration of zero-emission technologies into Port-related goods movement by adopting a new phase-in schedule. As shown in Attachment B, SCAQMD is supporting many ongoing demonstration projects that are expected to demonstrate the commercial feasibility of zero-emission cargo transporting equipment, such as drayage trucks and cargo handling equipment. Maintaining the commitment to demonstrate and deploy zero and near-zero emission trucks and equipment is necessary to mitigate the project's significant air quality impacts. Without this commitment, the increased emissions resulting from the Revised Project could have detrimental consequences to the entire region, including the ports, by contributing towards the region's nonattainment of federal and state standards. The Port must contribute in facilitating towards the advancement of a zero-emissions goods movement future. This further demonstrates the Port's commitment towards implementing the CAAP and helping the region meet clean air standards. More detailed comments are provided in the Attachments.

SCAQMD-5

The Port must aggressively look at all options and opportunities for emissions reductions from the Project to offset the foregone reductions from the lack of implementation of mitigation measures previously committed to and reduce emissions into the future. Thank you for the opportunity to provide comments on the Recirculated DSEIR. We look forward to working with the Port to address the comments raised herein and any other questions that may arise. We recommend setting up a meeting with SCAQMD staff, the project applicant, and Port staff to address these concerns expressed in this letter. Please feel free to call me at (909) 396-3176, if you have questions or wish to discuss our comments.

Sincerely,

Jillian Wong

Jillian Wong, Ph.D.
Planning and Rules Manager
Planning, Rule Development & Area Sources

Attachments
LAC181002-11
Control Number

[5] 2017 Final Clean Air Action Plan Update, Page 26. "The initial CAAP also made reducing health risk from individual port development projects an important objective by setting an increment threshold of 10 in a million excess residential cancer risk for new projects.
For the 2017 CAAP Update, the Ports remain committed to this 10 in a million threshold to manage health risk from individual port development projects, as well as to achieving the 2020 Bay-wide health risk reduction goal. At the same time, the Ports will continue to work with State, regional and local regulators and stakeholders to determine how continued reductions in emissions and an ever-improving baseline, and recent changes made by the State Office of Environmental Health Hazard Assessment (OEHHA) to procedures for calculation of health risk, could affect the way these goals are evaluated by the Ports in the future. The Ports will continue to evaluate whether this health risk threshold should be modified on a case-by-case basis for future redevelopment projects, particularly if new information or guidance arises."

ATTACHMENT A

SCAQMD-6

SCAQMD Staff's Summary of Project Description

SCAQMD staff understands that the Revised Project involves continued operation of the China Shipping Container Terminal under new or modified mitigation measures previously approved in the 2008 Final EIS/EIR. Modifications are proposed for 10 of the 52 mitigation measures that were approved in 2008, including six that are related to air quality. The Revised Project also assumes an increase in the projected cargo throughput of 147,504 twenty-foot equivalent units (TEUs) from the 1,551,000 TEUs projected in the 2008 Final EIR to 1,698,504 TEUs estimated for years 2030 and 2036-2045 in the Recirculated DSEIR. The China Shipping Container Terminal lease with the Port will expire in year 2045.

SCAQMD-7

SCAQMD Staff's Comments on Mitigation Measures (MM)

The emissions from the Revised Project already exceed the emissions projected in 2008 and will continue exceeding SCAQMD's CEQA significance thresholds into the future, negatively impacting the region and surrounding environmental justice communities. Therefore, SCAQMD staff recommends the Port set emissions reductions targets for the Project that are more aggressive than the originally approved mitigation measure reductions, and that are consistent with SCAQMD's recommended revisions to mitigation measures and the air quality attainment goals of the 2016 AQMP. The Project-based emissions reductions targets should use more recent Port growth projections, 2016 AQMP emissions inventories, and updated technology assessments to help determine the Project's fair share of emissions reductions. The emissions reductions targets will also help monitor the progress of emissions reductions by the Project, and ensure necessary actions by the Terminal operator and tenant for successful and effective implementation of the CAAP's Technology Advancement Program (TAP) and Clean Trucks Program (CTP), particularly zero or near-zero emission heavy-duty trucks.

Feasibility Determination

SCAQMD-8

SCAQMD staff is concerned with the Port's feasibility determination used to propose modifications to the approved mitigation measures in the 2008 EIR. For example, the mitigation measures in the 2008 approved Project included MM AQ-22 - Periodic Review of New Technology and Regulations, requiring a new technology review no less than every seven years, which would have subsequently prompted the implementation of new equipment, if proven feasible. Accordingly, a review of different new technologies should have been completed by 2015, seven years after the Project was approved. Without this required technology review, the proposed mitigation measures MM AQ-15, MM AQ-16, MM AQ-17, and MM AQ-20 should not be dismissed on the grounds of infeasibility.

The Recirculated DSEIR states that failure to implement the mitigation measures committed to in 2008 was due to a lack of feasibility determined by China Shipping. To illustrate this point, page 1-11 of the Recirculated DSEIR states that Cosco Shipping lost $1.44 billion in 2016. This is approximately equal to the 9,906,003,000 RMB loss found on page 3 of Cosco Shipping's 2016 Annual Report[6], using a conversion rate of 6.95 Chinese yuan to 1 US dollar[7]. While this financial loss occurred in the same year of Cosco's significant merger with China Shipping, other years demonstrate that this one-time loss is not indicative of long-term profits. For

[6] Cosco Shipping 2016 Annual Report. Available Here: http://en.chinacosco.com/attach/0/2016%20Annual%20Report.pdf
[7] Unit conversion rate. Accessed November 28, 2018. https://www.bloomberg.com/quote/USDCNY:CUR

SCAQMD-8

example, Cosco's most recent annual report shows that it made a profit of 2,661,936 RMB (~$382 million) in 2017[8] and also recorded annual profits since at least 2013[9].

Further, when the Port makes the finding that the recommended mitigation measures are not feasible, the Port should describe the specific reasons for rejecting them in the Final SEIR (CEQA Guidelines Section 15091).

Effective Start Date of Mitigation Measure Modifications

SCAQMD-9

Under CEQA Guidelines section 15126.4(a)(2), "Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments." SCAQMD staff is concerned with the enforceability of the modified mitigation measures that are scheduled to take effect one year after the effective date of a new lease amendment between the tenant and the Port. If issues are raised in the signing of the lease amendment, potentially delaying the scheduled implementation of these mitigation measures, then emissions reductions foregone since 2008 will continue to occur and impact the surrounding environmental justice communities, who are already affected by poor air quality resulting from activities at the Port. Therefore, SCAQMD staff recommends that all mitigation measures stating it will take effect after "the effective date of a new lease amendment between the Tenant and the LAHD," be revised to, "the date of certification of the Final Supplemental Environmental Impact Report (SEIR)." This recommendation will expedite the implementation of the modified mitigation measures by binding the effective start date to the earliest possible date and ensure a more timely compliance schedule, reflecting a similar date as the originally proposed date of effect of January 1st, 2019, in the 2017 DSEIR. Further, contingency measures should be put in place with approval of the Final SEIR to ensure that even if mitigation is not implemented on the SEIR's schedule that emissions reductions will occur. These measures should be crafted to provide sufficient motivation to ensure that commitments are followed through by the Port and China Shipping.

Mitigation Measures Modifications

SCAQMD-10

In order for the Project, and the Port as a whole, to ensure timely implementation of a zero-emission goods movement future, aggressive deployment of zero and near-zero emission CHE, cleaner trucks, and stringent mitigation, where feasible, is a must. Since the approval of the Project, a number of mitigation measures have been foregone, generating a substantial increase in emissions that were already at a level considered significant and unavoidable. The further weakening of the commitment to emissions reductions has harmful implications on the nearby communities. Therefore, SCAQMD staff strongly recommends that the Port maintain the original commitment to emissions reductions and has the following suggestions on how to achieve these reductions.

MM AQ-20 LNG-Fueled Drayage Trucks

SCAQMD-11

The Port excluded this measure in the Revised Project. The complete removal of this mitigation measure, which previously required the Port to phase in LNG-fueled drayage trucks entering

[8] Cosco Shipping 2017 Annual Report. Available Here: http://en.chinacosco.com/attach/0/2017%20Annual%20Report.pdf
[9] Cosco Shipping 2013-2015 Annual Reports. Available here: http://en.chinacosco.com/col/col1096/index.html

SCAQMD-11

and/or exiting the terminal, has substantial implications to air quality in the areas surrounding the Ports. Notably, LNG-fueled trucks made only six percent of truck calls operated by WBCT, including the Revised Project, while a Port-wide average of LNG-fueled drayage trucks was 10 percent.[10] The Port fell short of the commitment of 70% by 2014 and 100% by 2018 set forth in the 2008 approved Project, by a large margin.

SCAQMD staff disagrees with the LNG-fueled drayage trucks feasibility determination and urges the Port to re-commit to the mandate with a revised schedule. The complete removal of this measure shows a lack of commitment on the Port's behalf, in achieving a zero-emission goods movement future. Since the approval of this mitigation measure in 2008, near-zero natural gas-fueled drayage technology has advanced beyond the prototyping stage and has become commercially available and in-use today. Therefore, SCAQMD staff recommends the Port adopt a target phase-in schedule for near-zero (e.g., low-NOx natural gas) or zero-emission trucks, such as, but not limited to, the one included below, rather than removing a truck measure completely.

Implementation of near-zero or zero-emission heavy-duty trucks entering the Berth 97-109 Terminal could be targeted in the following percentages.

- 10 percent in 2019
- 25 percent from 2020 through 2022
- 50 percent from 2023
- 100 percent by 2029

SCAQMD-12

Since China Shipping typically does not contract directly with truck fleets entering the Berth, other feasible alternatives to facilitate this goal should be analyzed. One approach could include China Shipping establishing a preferred rate structure or other operational benefits for beneficial cargo owners (BCO) that contract with trucking fleets that utilize near-zero and zero-emission truck fleets first, then other alternatively fueled drayage trucks. This would incentivize BCOs to contract with cleaner truck fleets and contribute to the deployment of cleaner drayage trucks. Additionally, the Port should consider initiating a clean air fund with the approval of the Revised Project to pay for emissions reductions nearby that would be feasible should other emissions reduction approaches prove infeasible. This approach has been used by other projects in the region, and should be pursued again for the Revised Project. This fund could incentivize the purchase of near-zero and zero-emission trucks elsewhere, vessel retrofits, etc. Even if it is not feasible to fund the entirety of foregone emissions reductions, the Final SEIR should commit to the level of funding that is feasible. As another option, the Port could require China Shipping to provide incentives for zero or near-zero emission heavy-duty trucks entering their property through financial incentives, such as reduced rates, or operational benefits, such as a fast-track system.

MM AQ-9 Alternative Maritime Power

SCAQMD-13

The Port is proposing to decrease the rate of compliance of OGVs calling in to China Shipping connecting to shore power, which reduces emissions primarily from auxiliary engines otherwise maintained in the on position throughout the berthing process, from 100% to 95%. SCAQMD

[10] *Ibid*. Chapter 2, *Project Description*. Page 2-5.

SCAQMD-13

staff found that the Port Inventories showed that 99% of vessel calls to the China Shipping Terminal connected to AMP in 2016, and 96% in 2017. Therefore, proposing a lower compliance rate than what has been achieved in previous years on the grounds that implementation of the approved mitigation measure requiring 100% compliance is infeasible, is not supported. SCAQMD staff recommends that the Port require at least 99% of vessel calls to connect to AMP immediately after Final SEIR certification, or no later than January 1, 2020, as it has been demonstrated achievable and feasible in 2016 at the same terminal.

MM AQ-10 Vessel Speed Reduction Program (VSRP)

SCAQMD-14

The Port is proposing to modify the VSRP measure, which currently requires 100% of ocean going vessels to comply, to only require 95% compliance. Considering the Port's 98% compliance rate in 2015, and 96% compliance rate in years 2014 and 2016, the Port should require a 98% compliance rate immediately after Final SEIR certification, or no later than January 1, 2020, which was achieved in 2015. The Port currently gives a discount to ships that comply with the VSRP, meaning ships are incentivized to comply, not required. Another option to achieve a higher compliance rate would be to require a mitigation fee for non-compliance on those vessels choosing not to participate. Additionally, ships choosing not to comply on poor air quality days should have an increased mitigation fee to further offset the hazardous localized risk of emissions resulting from activity at the ports.

MM AQ-15 Yard Tractors at Berth 97-109

SCAQMD-15

The Port is proposing an alternative phase-in schedule for yard tractors being turned over from Liquefied petroleum gas (LPG) to engines with emission standards of 0.02g/bhp-hr for NOx and Tier 4 final for all other criteria pollutants. The Port is proposing a five-year phase-in schedule for all LPG 2011 and older yard trucks to be replaced. However, five years is far too long considering the federal ozone critical attainment date of 2023 is only five years from the date of recirculation, much less from an effective start date of the modified measures. Natural gas and zero-emission yard tractors have moved past the prototyping stage and are commercially available for deployment today. To help expedite the emissions reductions needed to attain the federal ozone AAQS, the Port should require that all LPG yard trucks 2011 and older be replaced within one year of Final SEIR certification with zero-emission yard tractors. Otherwise, they should be replaced with low-NOx engines at 0.02 g/bhp-hr or lower. In addition, 2012 and newer LPG yard tractors should be replaced within two years of Final SEIR certification with zero-emission yard tractors.

MM AQ-17 Yard Equipment at Berth 97-109 Terminal

SCAQMD-16

The Port is proposing an alternative phase-in schedule for the replacement of forklifts, top picks, RTGs, sweepers, and shuttle buses ranging from three years to seven years. SCAQMD staff is not only concerned with the effective start date of the scheduled implementation, as mentioned above, but also with the overarching delay of phasing in new equipment over a seven-year timeframe. Therefore, SCAQMD staff recommends that the Port optimize emissions reductions by speeding up the phase-in schedules of each type of equipment. Detailed comments on each equipment type provided below.

SCAQMD-16

Aside from the phased replacement of yard equipment, the second requirement of the originally approved MM AQ-17 was to conduct a one-year electric yard tractor pilot project, in which two electric yard tractors were to be deployed at the terminal within one year of lease approval, subsequently prompting a feasibility determination that could have potentially phased-in electric yard tractors, replacing half of the terminal's fleet within five years. While the Revised Project includes a commitment to a similar project, referred to in the Recirculated DSEIR as a one-year zero-emission demonstration project, the window of potential benefit from the project approved in 2008 has passed. SCAQMD staff urges the Port to commit to completing the project as expeditiously as practicable.

Additional comments regarding the modifications to the phase-in schedule of various equipment types are provided below.

SCAQMD-17

Forklifts

The phase-in schedule being proposed would not replace 18-ton diesel forklifts, with engines 2007 or older, until three years after the effective start date. SCAQMD staff recommends speeding up the implementation schedule and require engines to meet the low NOx emission standard of 0.02 g/bhp-hr, if commercially available within one year of Final SEIR certification. In the event low NOx is not commercially available, forklifts with Tier 4 final engines shall be deployed as quickly as possible. The 5-ton diesel forklifts should be replaced with zero-emission forklifts within one year of Final SEIR certification.

Top Picks

SCAQMD-18

The phase-in schedule being proposed would not replace top picks of model years 2014 or older, until five years after the effective start date. SCAQMD staff recommends speeding up the replacement schedule and require engines, model year 2007 or older within one year of Final SEIR certification, and model year 2014 or older within two years of Final SEIR certification, be replaced with top picks that meet the low NOx emission standard of 0.02 g/bhp-hr, if commercially available. In the event low NOx is not commercially available, top picks with Tier 4 final engines should be deployed under the same phase-in schedule.

Rubber Tired Gantries

SCAQMD-19

The phase-in schedule being proposed would not start replacing RTGs, with diesel engines 2005 or older, until seven years after the effective start date. The last step of implementation includes the installation of four all-electric RTGs and one diesel-electric hybrid meeting engine standards of Tier 4 final for PM and NOx. The electrical infrastructure necessary to support the installation of four all-electric RTGs is already in place[11]. Therefore, SCAQMD recommends speeding up the implementation schedule through a step down approach for the replacement of remaining diesel RTGs within two years of Final SEIR certification in the following order: 1) all electric RTGs, if technically and operationally feasible, 2) hybrid-electric RTGs that meet or exceed emissions standard 0.02g/bhp-hr for NOx if commercially available, and 3) hybrid-electric RTGs that meet or exceed Tier 4 final for all other criteria pollutants.

[11] *Ibid.* Section 3.1, *Air Quality and Meteorology.* Page 3.1-54

SCAQMD-20

Sweepers

The Port is proposing to replace all current sweepers with alternatively fueled sweepers, or the cleanest available technology, within six years of the effective start date. SCAQMD staff recommends expediting the implementation schedule by requiring all sweepers to be alternatively fueled, or cleanest available technology, within one year of Final SEIR certification.

SCAQMD-21

Shuttle Buses

The Port is proposing to replace all current shuttle buses with zero-emission shuttle buses within seven years of the effective start date. SCAQMD staff recommends expediting the implementation schedule by requiring all shuttle buses to be zero-emission within one year of Final SEIR certification.

Supplemental Mitigation Measure Recommendations

SCAQMD-22

Ship Retrofits

SCAQMD staff recommends that the Port include a new mitigation measure for ocean going vessels which would require the demonstration of feasible NOx and PM retrofit technologies, working with the tenant, and providing incentives for implementation of these technologies. The potential for emissions reductions associated with OGVs is substantial since a significant portion of the Project's emissions are coming from OGVs due to an increase in the projected cargo throughput. Implementation of these measures would help offset the emissions reductions already foregone from 2008 to the present.

Turn Times

SCAQMD-23

The Port should consider alternative measures to address foregone emission reductions and existing significant air quality impacts. One possibility is to incentivize greater efficiency of the terminal. For example, a recent article[12] found that the West Basin Container Terminal (including China Shipping) had the worst turn times (111 minutes) in either the port of LA or LB. It is not clear how these slow turn times are consistent with MM AQ-21 from the original EIR that requires idling of less than 30 minutes when trucks visit the terminal, among other requirements. This inefficiency increases the cost to the entire supply chain, increases emissions as trucks idle waiting for their loads, and makes mitigation more expensive to implement by decreasing the number of turns each truck can make. Measures that get at rewarding faster turn times, and that disincentivize slower turn times should be included in the Recirculated DSEIR and subsequent lease amendment.

This mitigation measure would increase operational efficiency and facilitate the goal of the 2017 Final CAAP Update, in which a one-hour turn time from in-gate to out-gate is achieved through integration and optimization of a reservation system, ensuring each truck is on-site for less than one-hour for a dual-transaction. Additionally, a fee or penalty for missing designated

[12] https://www.ttnews.com/articles/harbor-truckers-express-cautious-optimism-turn-times-2017

SCAQMD-23

appointments or reservations, whether it be due to China Shipping or WBCT, should be imposed on the party at-fault to further disincentivize excessive turn times.

SCAQMD Staff's Comments on Technical Air Quality and Health Risks Analyses

Health Risk Assessment and Air Quality Modeling

SCAQMD-24

Significant Cancer Risk

The Recirculated DSEIR found that the Revised Project results in incremental individual cancer risks of 25.4 in a million, 25.9 in a million, and 21.4 in a million, for residential, occupational, and other sensitive receptors, respectively. This would exceed the CEQA significance threshold of 10 in a million[13], whereas the FEIR Mitigated Scenario would have resulted in an incremental cancer risk below CEQA significance thresholds[14]. Although there is an increase in potential health risks as a result of the Revised Project, the Port has not proposed any additional mitigation measures to minimize health risks. Instead, the Port is proposing to operate the Terminal under less stringent mitigation measures, which lessen emissions reductions from those approved in the 2008 EIR. As such, SCAQMD staff recommends the Port provide additional mitigation measures to minimize increased health risks associated with the Revised Project. Specific comments on the mitigation measures is provided later in this Attachment.

SCAQMD-25

Air Dispersion Modeling-Locomotive Release Height

Based on a review of Table B2-1: AERMOD Source Parameters, the analysis included separate sources for locomotives operating during the day and during the night. Release heights for locomotives operating at night were set higher than for locomotives operating during the day (e.g. 5.6 meters for Offsite-Day and 14.6 meters for Offsite-Night). The Port referenced CARB's 2004 Roseville Rail Yard Study to justify the use of different release heights to account for daytime and nighttime conditions. However, the study used Industrial Source Complex Model Short Term Version 3 (ISCST3) to conduct the dispersion modeling, which did not have the ability to account for variations in atmospheric conditions. Here, the Port used AERMOD to conduct dispersion modeling, which already accounts for the diurnal patterns. By using a higher release height for nighttime locomotives, the analysis has likely underestimated health risks. SCAQMD staff recommends the Port include additional mitigation measures to reduce the underestimated health risks.

Based on Table B2-1: AERMOD Source Parameters footnote a, SCAQMD staff found that the Port has adjusted release heights for volume, area, and line sources higher than the actual exhaust release heights. However, the Port has not provided the methodology to justify these adjustments. By using higher release heights, it is likely that the Port has underestimated health risks due to an increased rate of dispersion at the increased release height. SCAQMD staff recommends the Port include additional mitigation measures to reduce the underestimated health risks.

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[13] *Recirculated DSEIR.* Appendix B3, Table B3-6. Maximum Health Impacts Estimated for the Revised Project, Page B3-24.
[14] *Ibid*. Page B3-29.

SCAQMD-25

Additionally, for locomotives, the Port has divided the release height by 2.15, instead of 4.3, to obtain the initial vertical dimension. Per Table 3-2 of the AERMOD User Guide[15], the initial vertical dimension for elevated sources not on or adjacent to a building is equal to the vertical dimension, which in this case is the release height, divided by 4.3. With a higher initial vertical dimension, it is likely that the Port has underestimated health risks. SCAQMD staff recommends that the Port include additional mitigation measures to reduce the underestimated health risks.

<u>Mitigation Measure Assumptions</u>

MM AQ-9 Alternative Maritime Power Assumptions

SCAQMD-26

The Port is proposing to modify MM AQ-9, which required 100% of vessel calls to connect to Alternative Maritime Power (AMP), to only require 95% of vessel calls to comply. However, in the air quality methodology section, the Port states, "peak day of OGV emissions for years 2023-2045 assume usage of AMP for all vessels at berth during the peak day, based on mitigation requirements from both the Revised Project and the FEIR Mitigated scenario."[16] Assuming both scenarios comply with the original AMP commitment is failing to analyze the difference between emissions resulting from the FEIR mitigated scenario and the Revised Project scenario. To be consistent with the assumption for MM AQ-9, SCAQMD staff recommends the Port provide additional information clarifying the AMP assumptions in both the FEIR Mitigated and Revised Project scenarios and include additional mitigation measures to reduce the additional impacts.

MM AQ-20 Liquefied Natural Gas (LNG)-Fueled Drayage Trucks Assumptions

SCAQMD-27

In the Revised Project scenario, the Port assumed that LNG would fuel 8.2% of drayage trucks entering and/or exiting the terminal, on the basis that 8.2% was the Port's LNG-fueled truck average in 2014. SCAQMD staff is concerned with this assumption, considering the Revised Project was below average in LNG-fueled trucks entering and/or exiting the terminal in 2014 (six percent). Since the Port is proposing to remove MM AQ-20, the air quality analysis should reflect this and assume LNG will fuel 0% of drayage trucks entering and/or exiting the terminal, regardless of port-wide averages, to analyze a true worst-case scenario, and additional mitigation measures should be included to reduce the additional impacts.

SCAQMD-28

<u>Air Quality Management Plan (AQMP) Consistency Analysis</u>

The air quality analysis in the Recirculated DSEIR concluded that the Revised Project is consistent with the AQMP. The 2016 AQMP did not take the Revised Project into account when calculating its emissions inventory. Additionally, the Revised Project has already resulted in foregone emissions reductions since 2008. The AQMP relies on commitments made by the Port and others to ensure that emissions reductions occur on time to meet federal and state standards. Since the Revised Project is a setback on the previous air quality commitments, the consistency of the Revised Project with the AQMP should be fully analyzed in the air quality section. Because of the precedent the Revised Project is setting by failing to meet previous commitments,

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[15] U.S. EPA. April 2018. AERMOD User Guide. Accessed at: https://www3.epa.gov/ttn/scram/models/aermod/aermod_userguide.pdf

[16] *Recirculated DSEIR.* Appendix B1, Section 3.1.5, Page B1-11

SCAQMD-28

SCAQMD staff recommends that the Port analyze the consistency of the Revised Project with the AQMP in the air quality section by addressing the emissions reductions foregone in past years and the estimated increase in emissions resulting from the Revised Project's mitigation measure modifications, and disclose these results in the Final SEIR.

Entire attachment is AQMD 29

ATTACHMENT B

ZERO EMISSION TRUCK TECHNOLOGIES

Overview

Zero emission trucks, including heavy-duty trucks, are developing rapidly with some of the technologies ready for near-term deployments. Zero emission trucks can be powered by grid electricity stored in a battery, by electricity produced onboard the vehicle through a fuel cell, or by "wayside" electricity from outside sources such as overhead catenary wires, as is currently used for light rail and some transit buses. All such technologies eliminate fuel combustion and utilize electric drive as the means to achieve zero emissions and higher system efficiency compared to conventional fossil fuel combustion technologies. Hybrid electric trucks with all-electric range (AER) can provide zero emission operations in certain corridors and flexibility to travel extended distances powered by fossil or renewable fuels (e.g. natural gas) or hydrogen for fuel cells. In collaboration with regional stakeholders and partners as well as leveraging funding support from both federal and state agencies, SCAQMD has been supporting a number of projects, as described below, to develop and demonstrate zero emission cargo transport technologies to promote and accelerate its market acceptance and deployment.

2014 DOE Zero Emission Cargo Transport Demonstration Project (ZECT II)

Project Description

In August 2014, SCAQMD received an award of approximately $9.7 million from the DOE to develop and demonstrate seven zero emission drayage trucks in real world drayage operations at the Ports of Los Angeles and Long Beach. Six of them will be of fuel cell range extended electric trucks and the remaining truck will be built on a hybrid electric drive platform using a CNG auxiliary power unit as described below:

Fuel Cell Range Extended Trucks (FCREs)

a. Under project management by Center for Transportation and Environment, Kenworth and BAE Systems are developing a battery electric truck with hydrogen fuel cell range extender. This project will leverage the expertise of BAE Systems to test their hybrid electric fuel cell propulsion system, currently used for transit buses, in drayage applications. The power output of the electric drivetrain is comparable to currently used Class 8 truck engines power output. AC traction motors will be mounted one on each rear drive axle and the electric drivetrain in the architecture is set up to be fully redundant. The vehicle will operate primarily from the batteries, engaging the fuel cell system only when the batteries reach a specified state of charge. BAE anticipates that the 30 kg of hydrogen (25 kg usable) will provide approximately 110 to 120 miles of range between re-fueling.

b. Hydrogenics will develop a hydrogen fuel cell drayage truck powered by their latest advanced fuel cell drive technology (Celerity Plus fuel cell power system) and Siemens' ELFA electric drivetrain, customized for heavy duty vehicle applications. The proposed fuel cell drayage truck is designed to be capable of delivering over 150 miles of zero emission operation with 10-15 minutes fast refueling of hydrogen. The fuel cell drivetrain will be customized, tested and optimized for port applications.

c. TransPower will develop two battery electric trucks with hydrogen fuel cell range extenders. The fuel cell range extender project is to use TransPower's proven ElecTruck™ drive system as a foundation and add fuel cells provided by Hydrogenics, one of the world's leading suppliers of hydrogen fuel cells. The proposed project will result in the manufacturing and deployment of two demonstration trucks, one with a 30 kW fuel cell and one with a 60 kW fuel cell, enabling a direct comparison of both variants. The higher power output of the 60 kW systems is expected to be better suited for trucks carrying heavy loads over longer distances that might exceed the average power capacity of the 30 kW systems. The system will store 25-30 kg of hydrogen onboard based on an estimated 7.37 miles per kg fuel economy. TransPower's system also includes a bi-directional J1772-compliant charger that can recharge the vehicle batteries or provide power export.

d. U.S. Hybrid will develop two battery electric trucks with an onboard hydrogen fuel cell generator. U.S. Hybrid has been involved with fuel cell-powered vehicles for several years (including cargo vans, transit/shuttle buses and heavy-duty military vehicles) and believes the technology and product has reached maturity beyond feasibility and is ready for commercial demonstration deployment. The truck is powered by a lithium-ion battery with an 80 kW hydrogen fuel cell generator in charge sustaining mode, eliminating the need for charging. The fuel cell power plant is sized to sustain continuous operation based on average power demand for drayage applications. As a result, the battery size is significantly reduced, as is the required charging infrastructure. The proposed technology will provide a 150-200 mile range between refueling. Each truck will carry approximately 20 kg of hydrogen storage at 350 bar with an estimated fueling time of less than 10 minutes.

The fuel cell Class 8 trucks are expected to initiate demonstration at local trucking fleets over the next 3-18 months.

<u>Plug-In Hybrid Electric Trucks (PHETs)</u>

e. Under project management by Gas Technology Institute, Kenworth and BAE Systems will develop a PHET with a CNG range extender. The proposed technology is capable of providing a well-balanced blend of all electric and CNG-based hybrid operations. The electric drivetrain will be based on BAE Systems HybriDrive® Series (HDS) propulsion system hardware. The electric drivetrain will be capable of combined propulsion power output of 320 kW (430 hp) continuous using two AC traction motors. The power output of the electric drivetrain is comparable to currently used Class 8 truck engines power output. The truck will be designed to provide an operating range of 150 miles with 30 all-electric miles.

Cost
Cost estimates are not available for these trucks although with incentives the cost to customers is expected to be in line with other similar technologies, and the costs are expected to be substantially reduced once these trucks reach a wide-scale deployment and full-production phase.

Timeline and Commercialization
The demonstration phase of this project was started in Q2 2018 with two trucks, one each from TransPower and US Hybrid and the other trucks to start demonstration in Q1 and Q2 of 2019. The project is set be completed by Q3 2019 although talks have begun with the DOE to extend the project by an additional year. The commercialization process will continue in other projects for two of the technologies demonstrated by Kenworth. The Kenworth CNG Hybrid will continue to be developed in the CARB Zero Emission Drayage Truck Demonstration Project described below and the Kenworth Fuel Cell Range Extended truck will continue developed with a recently CARB awarded project with the Port of Los Angeles.

CARB Zero Emission Drayage Truck Demonstration Project

Project Description
SCAQMD received an award of approximately $23.6 million to develop and demonstrate zero emission drayage trucks under CARB's Low Carbon Transportation Greenhouse Gas Reduction Fund Investments Program in 2016. The project is to develop a total of 44 Class 8 drayage trucks based on a portfolio of most commercially promising zero- and near-zero emission truck technologies for statewide demonstrations, across a variety of real world drayage applications in and around the Ports of Long Beach, Los Angeles, Oakland, Stockton and San Diego, in collaboration with four other air districts: BAAQMD, Sacramento Metropolitan AQMD, SJVAPCD and SDAPCD. SCAQMD has contracted with three major U.S. OEMs and an international OEM, with necessary resources and networks to support future commercialization efforts, to develop and demonstrate four different types of battery and hybrid electric drayage truck technologies in this project, including: two battery electric platforms (BYD and Peterbilt), and two plug-in hybrid electric platforms (Kenworth and Volvo) as summarized below:

Battery Electric Trucks (BETs)

a. BYD, a global company with over $9 billion in revenue and 180,000 employees, will develop 25 battery electric drayage trucks for demonstration with multiple fleet partners across the state. The BET is optimized to serve near-dock and short regional drayage routes with a range of 70-100 miles, supported by 207 kWh batteries on board. The truck is designed to provide similar operating experience compared to equivalent diesel and CNG trucks with matching or exceeding power and torque, powered by two 180 kW traction motors. BYD will utilize 80 kW on-board charger to fully recharge the truck within 3 hours. These trucks are already eligible for incentive funds under CARB's HVIP.

b. Peterbilt, in partnership with TransPower, will develop 12 BETs in this project, building on a platform developed under the DOE ZECT I project, incorporating lessons learned from ongoing demonstrations to further refine and optimize the electric drive system. Eight trucks will be designed to provide 65 miles in range, powered by a 215 kWh battery pack to support near-dock drayage operations, and four longer range BETs will incorporate a new battery design that allows for 120 miles of operation per charge with a 320 kWh battery pack at the same system weight with similar volume as the 215 kWh battery pack. These longer range BETs will be well suited for regional drayage routes such as from port terminals to Inland Empire and from the Port of Oakland to Sacramento and the San Joaquin Valley.

Plug-In Hybrid Electric Trucks (PHETs)

c. Kenworth expands its partnership with the BAE Systems to develop four PHETs with natural gas range extenders, leveraging the prototype development under the DOE-funded ZECT II project. These vehicles will target longer regional drayage routes. The team will continue refining the hybrid drivetrain to provide a system that can operate in a zero emissions (all-electric) mode and in a conventional hybrid electric mode to meet customer range needs and flexibility. The powertrain includes a 200 kW genset using a recently-certified 8.9L NZ CNG engine and two AC traction motors that produce 320kW (430 hp) continuous, with comparable power output to what is typically found in Class 8 truck engines. The hybrid system will be designed for an operating range of 150 miles with approximately 30-40 miles of all-electric range to operate in zero emissions mode in sensitive areas and disadvantaged communities.

d. Volvo will build on the success of past projects to develop three commercially attractive, highly-flexible hybrid trucks, with all-electric mode capability of up to 30 miles for zero emission operations and total daily range of up to 200 miles in hybrid electric mode. Volvo offers a unique approach to system-focused hybrid powertrain improvements, utilizing a suite of innovative technologies such as energy and emission optimized driveline controls; aerodynamics and weight improvements; vehicle energy management and driver coaching systems optimized for port drayage operation; and a complete suite of NOx reduction technologies, including engine and exhaust after-treatment innovations. Furthermore, Volvo, in partnership with Metro and UC Riverside, will also integrate ITS connectivity solutions, such as vehicle-to-infrastructure and vehicle-to-vehicle communication technologies, to improve dynamic speed harmonization and reduce idling, for better fuel economy and reduced emissions.

Cost

Cost estimates are not available for these trucks, although with incentives the cost to customers is expected to be in line with other similar technologies, and the costs are expected to be substantially reduced once these trucks reach a wide-scale deployment and full-production phase.

Timeline and Commercialization

The demonstration phase of this project started in Q2 2018 with 3 BYD trucks that have highlighted the need for some design modifications, Q3 2018 with Peterbilt trucks, and Kenworth and Volvo trucks to follow in 2019. This project is set be completed by Q2 2020 and the commercialization of these truck technologies will continue into the near term.

BYD Prototype Drayage Truck

Volvo PHET

CEC Sustainable Freight Transportation Project

Project Description

SCAQMD recently received a $10 million award from the CEC under the Alternative and Renewable Fuel and Vehicle Technology Program to develop and demonstrate zero and near-zero emission freight transportation technologies. One of the awarded technologies is electric drayage trucks, to be built on the PowerDrive™ platforms developed by Efficient Drivetrains, Inc., (EDI), a global leader and innovator of advanced, high-efficiency electric drivetrains and vehicle control software.

Under project management by Velocity Vehicle Group, this project is to develop and demonstrate four electric drayage trucks, consisting of one BET and three PHETs, with EDI serving as the technical lead and vehicle integrator, and Freightliner providing necessary engineering resources and expertise in vehicle design and glider manufacturing. Both battery electric and hybrid electric drive platforms will be designed to meet end-user fleet requirements. The platforms will be also designed so that it can be easily integrated by post-production truck modification service companies and serviced by Freightliner dealerships. Based on the proposed technical concept, the BET will be capable of 100 miles in operating range and the PHETs will utilize Cummins 8.9L natural gas engine as a range extender to provide 250 miles in operating range per fueling with up to 35 miles in all-electric range.

Cost

Cost estimates are not available for these trucks, although with incentives the cost to customers is expected to be in line with other similar technologies, and the costs are expected to be substantially reduced once these trucks reach a wide-scale deployment and full-production phase.

Timeline and Commercialization

This project is to be completed by Q4 2021 and the commercialization process of these truck technologies can be expected to continue into the near term.

Daimler Zero Emission Trucks and EV Infrastructure Project

Daimler Trucks North America (DTNA) was awarded $15,670,072 by SCAQMD with an equal amount of matching funds the project total will be $31,340,144 to develop battery-electric heavy-duty trucks. DTNA will demonstrate these trucks in real-world commercial fleet operations in and around environmental justice communities for a period of two years within SCAQMD's jurisdiction. DTNA will gather data and information from the end-users including performance under specific duty-cycle applications during the demonstration. DTNA will utilize the data and information to move toward the commercial production and sales phase. DTNA will supply five Class 6 trucks with a gross vehicle weight rating (GVWR) up to 26,000 pounds and 15 Class 8 trucks with a GVWR up to 80,000 pounds, including associated EV charging infrastructure. Fleet partners will be identified and the trucks integrated into a range of services and applications to gather operational data to improve each charging and utilization scheme, with seven of the Class 8 trucks to be used in port drayage operations, supporting the goods movement industry.

The drivetrain of the Class 6 electric trucks is capable of delivering over 220 horsepower, and the design allows for a burdened load with GVWR up to 26,000 pounds. Each charge of the battery can give operators 150-200 miles of service range, and the medium-duty design comes with a 4x2 axle configuration with a day cab of 106 inches. The batteries that come equipped with the Class 6 truck design will have a capacity of 225-300 kilowatt hours (kWh). The truck is capable of being charged with a Combined Charging Standard Type 1 (CCS T1).

The Class 8 truck model will be designed to have a range of 150-200 miles between charging. The electric drivetrain is capable of delivering over 455 horsepower and is designed to meet the needs and specifications of transportation of a GVWR of up to 80,000 pounds. The vehicles will have a 6x4 axle configuration with a 116-inch day cab, and the battery system will provide 400-600 kWh of usable power. The Class 8 vehicles will also use the CCS T1 charging systems.

DTNA will install DC fast charger stalls at four fleet locations providing an adequate number of chargers to support their fleet of 20 trucks. Each fast charger will be equipped with an SAE J1772 Combo (CCS T1) interface and will be capable of charging at up to 160 kW. The chargers will also be connected remotely for troubleshooting, management and data collection. Each DC fast charger will be paired with multiple battery energy storage systems (ESS) to optimize utility costs and reduce infrastructure enhancements required to support the chargers. DTNA will deploy the battery-based ESS paired with each high power vehicle charger. The proposed chargers will allow an 80% state of charge for the Class 6 trucks in two hours and the Class 8 trucks in three hours. Deploying two chargers per site will result in potential peak power demands of approximately 335 kW. The ESS will be comprised of two or more modular units paired with a single charger. Each unit will be capable of delivering 60-70 kW at 480 volts AC power and will store 110-120 kWh of energy. Utilizing grid-aware scheduling algorithms, the ESS will charge from the grid during low-cost periods and over extended periods of time. This allows the ESS to recharge from the grid at a much lower peak power demand, reducing utility and facility infrastructure requirements and reducing or eliminating utility demand charges.

Cost
Cost estimates are not available for these trucks, although with incentives the cost to customers is expected to be in line with other similar technologies, and the costs are expected to be substantially reduced once these trucks reach a wide-scale deployment and full-production phase.

Timeline and Commercialization
With funding support from SCAQMD, 20 battery-electric heavy-duty trucks will be immediately built and deployed in order that incredible amounts of data and information can be gathered from the diverse end-users and applications that will be run by these units. Funding from SCAQMD will accelerate the development and scaling of commercially available all-electric heavy-duty trucks in the marketplace. The timeline for the project is for the trucks are to be deployed starting in Q4 2018 and all 20 trucks and EV infrastructure fully deployed by the end of Q1 2019. The demonstration will begin immediately following deployment and continue through Q3 2021.

Volvo's Zero Emissions Heavy-Duty Trucks, Freight Handling Equipment Project

SCAQMD has received a $44,839,686 award from CARB in partnership with Volvo Group North America, LLC, (Volvo) to conduct a freight facility project that will realize commercialization and market penetration of heavy-duty battery electric vehicles (HDBEVs) in California and throughout North America. With an additional $41,655,308 in cash and cost share from Volvo, SCAQMD and partners, the total project cost will be $87,246,900.

Volvo will develop and demonstrate the following on-road and off-road vehicles, EV Infrastructure and solar power for deployment at up to five sites within the cities of Chino, Fontana, La Mirada, Ontario and Placentia:

- 23 on-road pre-commercial and commercial Heavy Duty Battery Electric Vehicles (HDBEV) operating in and around disadvantaged communities;
- 29 off-road BEVs used to load and unload containers and freight at warehouses and freight facilities;
- 58 nonproprietary chargers both DC fast charging and Level 2 electric vehicle supply equipment (EVSE) with SAE approved connectors; and
- 1,860,462 watts of solar power.

The project includes a total of up to 23 HDBEVs and will begin with up to 8 multiple-configuration, pre-commercial truck deployments. The first three demonstration trucks will not be fully approved for U.S. operation and will therefore operate under CARB exemption waivers. The subsequent 5 demonstration units as well as up to 15 commercial/pre-commercial vehicles, will be approved for the U.S. market. Volvo will begin commercial introduction of the HDBEV rigid trucks and use mobile fast charging for fleets throughout the state to gain freight experience with battery electric trucks.

Based on Volvo's proposal, the three electric truck configurations to be delivered are anticipated to be equipped with the following driveline items:

- Two electric motors with 370 kW max power (260 kW continuous power) with a Volvo two-speed transmission.

- Average electric range is 170 miles depending on drive cycle. Throughout the course of this project, vehicles will be able to go 150-350 miles.
- Lithium-ion batteries for energy storage will have a minimum capacity of 200 kWh for the first two demonstrators, later increasing to four and then six battery pack configurations for a capacity of 320 kWh.

Volvo will deliver new lithium-ion battery chemistries for increased electrical energy densities at reduced cost; self-learning control algorithms which optimize energy usage in EVs; smart technologies to improve vehicle uptime and deployment of long-term rentals of HDBEVs to fleets throughout the state to accelerate adoption. Additionally, Volvo will coordinate the development of energy management systems to optimize vehicle charging by balancing the requirements of the vehicle, facility and grid. Vehicle charging will use SAE J1772 connectors for Level 2 charging and SAE J3068 or SAE CCS connectors for fast charging. Charging infrastructure includes 150 kW DC or 22 kW AC for the first two demonstration units and 250kW DC or 44 kW AC for subsequent and commercialized units. The freight facility sites will each feature standards-based, open architecture and interoperable charging infrastructure for off-road electric equipment, on-road electric trucks and employee workplace charging. Two standards-based, open architecture and interoperable charging stations along a key freight corridor for use by project fleets and the public will also be deployed. Up to 58 chargers will be installed ranging from 7.2 kW up to 150 kW.

Cost
Cost estimates are not available for these trucks, although with incentives the cost to customers is expected to be in line with other similar technologies, and the costs are expected to be substantially reduced once these trucks reach a wide-scale deployment and full-production phase.

Timeline and Commercialization
The Volvo project is planned to begin in the Q1 of 2019 and be completed in Q1 of 2021.

Response to Comment SCAQMD-1

The history of the China Shipping Container Terminal Project is discussed in detail in Section 1.3 of the Recirculated DSEIR, including the basis for proposal of the Revised Project that is evaluated in this SEIR. As explained in detail in the Introduction and Project Description chapters of the Recirculated DSEIR, of the 52 measures adopted in the 2009 EIS/EIR, 10 mitigation measures and one lease measure from the 2008 EIS/EIR have not been fully implemented in a timely manner; re-evaluation by LAHD of those measures, based on the feasibility of those measures, subsequent availability of alternative technologies, and actual need for mitigation, has shown that certain measures identified in the 2008 EIS/EIR are unnecessary or infeasible, while others need to be modified to ensure their feasibility or to incorporate advances in technology. The Revised Project replaces those 2008 EIS/EIR mitigation measures that LAHD has determined are infeasible or no longer necessary and determines based on substantial evidence that no further or additional feasible mitigation is available for those impacts, or for the impacts of the Revised Project. In compliance with CEQA, and as is addressed in detail in Section 2.5.2.1 of the Recirculated DSEIR, the Revised Project comprises all feasible replacement mitigation measures for significant impacts of the China Shipping Container Terminal Project.

CEQA requires, however, that LAHD may not implement the revisions to mitigation that constitute the Revised Project until it has completed environmental review of the modified or deleted mitigation measures (See Napa Citizens for Honest Govt. v. Napa County Bd. of Supervisors (2001) 91 Cal.App.4th 342, 359). Therefore, the project approvals that were previously granted, based on the 2008 EIS/EIR, remain in effect without modification until such time as revisions to mitigation are approved after environmental review. LAHD is proceeding as expeditiously as possible with that process, which necessarily requires that it take the time necessary to ensure full and adequate compliance with CEQA.

With respect to zero and near-zero-emissions trucks and cargo handling equipment, please see Master Response 2: Zero-Emissions Technologies and Master Response 3: Port-Wide Emissions Reduction Programs.

Response to Comment SCAQMD -2

As explained in Section 1.2.3.2 of the RDSEIR, the ASJ allowed for China Shipping to continue operating the terminal under the existing lease (Permit No. 999) signed in 2001. While the lease was supposed to have been amended after certification of the 2008 EIR, "[t]he preparation of an EIR is not generally the appropriate forum for determining the nature and consequences of prior conduct of a project applicant . . .." (*Eureka Citizens for Responsible Gov't v. City of Eureka* (2007) 147 Cal.App.4th 357, 371). As required under CEQA, the Recirculated DSEIR will be used by LAHD, as the lead agency under CEQA, in making a decision regarding the future operation of the Revised Project. If it is determined that changes to existing mitigation measures are recommended as a result of the Recirculated DSEIR, the Board of Harbor Commissioners will consider amending the lease for operations at Berths 97-109 to include those measures. Any action by LAHD to enforce mitigation measures (past or future), or other lease provisions, would be a separate proceeding outside the scope of this EIR process. In addition, please refer to Master Response 4: Non-Compliance with the FEIR Mitigation Measures.

Response to Comment SCAQMD-3

Please see Master Response 2: Zero- and Near-Zero-Emission Technologies for a more detailed discussion of this issue. The LAHD agrees that there have been major advances in emissions reduction and control technology since 2008, including near-zero- and zero-emission technologies in the goods movement industry. As the 2017 CAAP discusses in considerable detail (2017 CAAP Section 1), the Port anticipates that marine terminals will transition to zero- and near-zero-emission cargo handling equipment by 2030, and the drayage industry to zero- and near-zero-emission trucks by 2035. As a clarifying point, please note that the figure of 1,200 lbs of NO_X per day cited in the comment is the difference between the Revised Project Scenario and the FEIR Mitigated Scenario in 2014, as shown in Table 3.1-11, not the 5,284 pounds per day difference in emissions between the Revised Project in 2014 and the 2008 baseline, which is disclosed in Table 3.1-9 for purposes of the SEIR's impact-significance determination between 2008 and 2014.

The LAHD disagrees with the comment's characterization of the Recirculated DSEIR as "relaxing and removing key air quality mitigation measures with no replacement measures." The Revised Project proposes to remove MM AQ-16 because it was determined to be completely redundant to MM AQ-17 and therefore achieved no additional emissions reductions, and MM AQ-20, because it was determined to be entirely infeasible. In the case of MM AQ-20, the concept of attempting to force an individual terminal to alter the drayage truck industry was determined to be infeasible (Recirculated DSEIR Section 2.5.2.2), meaning that there is no feasible replacement measure that could be applied to the CS Terminal. The remaining air quality measures were modified to make them feasible given the state of technology at this time. Accordingly, the Recirculated DSEIR does propose all feasible mitigation.

Furthermore, the LAHD does not agree that the environmental document for a single project (particularly one that does not include any physical modifications of the terminal) is the appropriate mechanism for mandating the introduction of zero-emission technologies that have yet to be proven feasible. The 2017 CAAP anticipates the introduction of technologies such as near-zero- and zero-emission cargo-handling and other goods movement-related equipment, but explicitly points out that most of those technologies are not yet available for application in the port environment. The 2017 CAAP and the 2018 Feasibility Study (Tetra Tech/GNA, 2019b) do not identify any of these technologies as feasible for terminal-specific mitigation. At this time, near-zero- and zero-emission technologies are still in the pilot and demonstration phases, and forcing a marine terminal to employ them in large numbers, only to discover subsequently that they cannot do the work or are economically uncompetitive, would guarantee future non-compliance. The Recirculated DSEIR does provide for incorporation of currently unavailable technologies in the future, at such time as they are determined to be feasible: LM MM AQ-1 and LM AQ-3 obligate the CS Terminal to test and evaluate zero-emission equipment and to purchase such equipment as it is deemed feasible, consistent with the goals of the 2017 CAAP.

Response to Comment SCAQMD-4

As described in Section 2.5.2 of the Recirculated DSEIR, the mitigation measures that were modified under the Revised Project were determined to be either infeasible as initially formulated (e.g., MM AQ-20) or no longer relevant (e.g., MM AQ-16 and several transportation-related measures). The purpose of the SEIR is to modify infeasible mitigation measures and to impose all feasible mitigation. Any increases in emissions are attributable to increased projected cargo throughput compared to the projections in the 2008 EIS/EIR and to the lesser effectiveness of feasible mitigation measures compared to the measures contained in the 2008 document that turned out to be infeasible.

With respect to consistency with the AQMP, it is important to note that the AQMP is not based upon commitments from specific projects analyzed under CEQA, and in fact neither the CS Terminal nor the Approved Project is referenced anywhere in the 2016 AQMP. Rather, the 2016 AQMP emissions inventory is based on CARB regulatory models and databases using existing fleet information; technologies based on the current fleet and the future effects on that fleet of adopted rules and regulations; and regional and sub-regional growth forecasts, including growth at the ports. The 2016 AQMP does not rely upon emission reductions from those mitigation measures, and those measures do not affect the 2016 AQMP control strategy. Please see Response to Comment SCAQMD-28 for more detail on this issue.

With respect to consistency with the 2017 CAAP, the Revised Project contains, and the Recirculated DSEIR analyzes, feasible mitigation that can be applied to reduce air emissions from operation of the CS Terminal. The Revised Project does not “remove key air quality mitigation measures from the 2008 EIR.” Instead, it revises the mitigation measures to make them feasible in accordance with to current technology and operating practices. The Revised Project proposed to combine Mitigation Measure MM AQ-16 with MM AQ-17. The Revised Project proposed to eliminate MM AQ-20 because it was never feasible (see Response to Comment SCAQMD-3) and would not have achieved any emissions reductions. See Master Response 1: Feasible Mitigation – Guidance and Applicability and Master Response 2: Zero Emission Technologies for discussions of the infeasibility of MM AQ-20.

The 2017 CAAP anticipates the introduction of technologies such as near-zero- and zero-emission cargo-handling and other goods movement-related equipment, but explicitly points out that most of those technologies are not yet available for application in the port environment. As discussed in the Recirculated DSEIR (Section 3.1.4.4, Impacts AQ-3 and AQ-8), the Revised Project is consistent with the 2017 CAAP: it includes feasible mitigation measures that will reduce emissions and it includes provisions (LM AQ-1 and LM AQ-3) to incorporate advanced technologies into the CS Terminal’s operations as they are deemed feasible.

The comment references Attachment B, which is a list of projects being supported by the District and CARB. Given that all of those projects are pilot and demonstration projects, many apparently not even underway at the time the list was prepared, the LAHD does not agree that the attachment supports a claim of current feasibility. In fact, as Master Response 2: Zero- and Near-Zero-Emission Technologies explains, none of the technologies listed in Attachment B has reached a stage of development sufficient to be deemed commercially and operationally feasible.

Response to Comment SCAQMD-5

The comment is noted and is hereby part of the Final SEIR. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment SCAQMD-6

The District's summary of the Revised Project is noted and is hereby part of the Final SEIR. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment SCAQMD-7

LAHD does not believe that it is feasible to establish emissions reductions targets beyond the reductions achieved by the feasible mitigation measures evaluated in this SEIR. With respect to the District's recommendations for more aggressive emissions reduction targets and mitigation measures, please see Master Response 1: Feasible Mitigation – Guidance and Applicability and Master Response 2: Zero-and Near-Zero-Emission Technologies; the mitigation measures in the Revised Project represent the most aggressive feasible measures that can at present be imposed on a single terminal through CEQA.

With respect to consistency with the 2016 AQMP, please see Response to Comment SCAQMD-28. With respect to the issue of Port growth projections, please note that, as described in Section 1.4.1, the Recirculated DSEIR used the most recent projections of Port cargo growth and terminal capacity available (i.e., 2016 projections). In fact, those data were the basis for including a revised estimate of future throughput at the CS Terminal as a factor in assessing the impacts of the Revised Project (Recirculated DSEIR Section 1.4.1.5); otherwise, the Recirculated DSEIR would have used the throughput projections in the 2008 EIS/EIR, resulting in substantially less impact than identified in this analysis.

With respect to technology assessments performed as part of the 2017 CAAP, see Master Response 2: Zero- and Near-Zero-Emission Technologies. All of the factors presented in that master response were taken into consideration, as suggested by the commenter, in developing mitigation measures that are feasible and can contribute to the Revised Project's fair share of emission reductions.

Response to Comment SCAQMD-8

With respect to the comment on the measure identified in the 2008 EIS/EIR's MMRP as "MM AQ-22 – Periodic Review of New Technology and Regulations," that measure was not imposed as a CEQA or NEPA mitigation measure on the original project approval. Rather, the 2008 EIS/EIR determined that measure did not meet all the criteria for CEQA or NEPA mitigation, and instead identified it as a lease measure with uncertain potential to reduce future emissions. Because the potential for MM AQ-22 to reduce emissions was not known, it was not included in calculating project emissions in the 2008 EIS/EIR. That measure, in combination with LM AQ-23 and as discussed in Section 2.5.2.1 of the Recirculated DSEIR, was not incorporated into the tenant's permit. As a result, the seven-year technology review was not implemented by 2015. Even if the review had taken place in 2015, none of the measures related to cargo-handling equipment (MM AQ-15, AQ-16, and AQ-17) would have been affected: the latter two had implementation dates prior to January 1, 2015, and MM AQ-15's implementation date was 1 January, 2015. In the case of MM AQ-20, which had implementation dates extending to 2018, a 2015 technology review would not have identified an alternative feasible technology given that there is still no such technology in 2019 (see Master Response 2: Zero-and Near-Zero-Emission Technologies). Please note that the original intent of LM AQ-22 – to facilitate the incorporation of lower-emission technologies into the operation of the CS

Terminal as they become available – is met by the Revised Project's LM AQ-1: Cleanest Available Cargo-Handling Equipment. That measure ensures periodic check-ins to verify that the CS Terminal's equipment replacement process is consistent with the goals of the 2017 CAAP regarding near-zero- and zero-emission equipment.

The LAHD disagrees with the District's characterization of the Recirculated DSEIR as having dismissed MMs AQ-15, AQ-16, and AQ-17 on the grounds of infeasibility. MM AQ-16 was not dismissed but rather combined with MM AQ-17 because there is actually no distinction between railyard equipment and container yard equipment. MMs AQ-15 and AQ-17 were not dismissed but were instead revised to reflect the realities of current cargo-handling equipment. The Recirculated DSEIR notes (Section 2.5.2.1) that, consistent with the findings of the 2017 CAAP, zero-emission technologies were not, at the time of publication, feasible for yard tractors, top-picks, and heavy-duty forklifts. However, the Recirculated DSEIR also notes that, in accordance with the goals of the 2017 CAAP, CARB, and the mayors of Los Angeles and Long Beach, such technology is expected to be phased in to the CS Terminal over the next decade (i.e., by 2030 at the latest). MM AQ-17 requires the CS Terminal to transition to all-electric RTGs in those areas of the terminal that can support them and explains why the entire RTG inventory cannot be converted to electric power without substantial terminal modifications. Furthermore, LM AQ-1 requires the terminal to work with the Port to attain the 2017 CAAP's equipment procurement goals (i.e., to transition to zero-emission CHE as soon as practicable).

MM AQ-20 was dismissed on the grounds of infeasibility based upon substantial evidence. As described in detail in Section 2.5.2.1 (pp 2-22 to 2-24) and the report "Assessment of the Feasibility of Requiring Alternative-Technology Drayage Trucks at Individual Container Terminals," cited in that section as LAHD (2017) and hereinafter the "Drayage Truck Study," the Port based its dismissal of MM AQ-20 on three factors: industry structural constraints, truck technology constraints, and financial constraints.

With regard to the financial issues raised in the comment, please note that at no point did the Recirculated DSEIR determine infeasibility exclusively on the basis of financial loss or hardship. The financial information in Chapter 1 of the Recirculated DSEIR was provide as background to illustrate the economic downturn that occurred after certification of the 2008 FEIR. China Shipping is a subsidiary of Cosco, not the entirety of that corporation, and Cosco's profits and losses are not necessarily indicative of China Shipping's economic performance in a given year. Furthermore, China Shipping's operations at the CS terminal must be financially competitive with the other terminals operating in the Ports, regardless of Cosco's global financial performance, meaning that very expensive mitigation measures may be unduly burdensome to the terminal.

The LAHD intends to comply fully with all requirements of CEQA with regard to mitigation measures determined to be infeasible.

Response to Comment SCAQMD-9

Please refer to Response to Comment CoSPNC-4. The Recirculated DSEIR explained this issue in detail in Section 2.5.2.1. Furthermore, binding the effective start date of mitigation measures to certification of the Final SEIR, as the District recommends, would not result in most of those measures actually being implemented. All of the measures require implementation by the CS Terminal's tenant, and the only way to obligate the tenant to implement the measures is through provisions of a lease amendment. As the District pointed out in its own comment, "Mitigation measures must be fully enforceable through permit conditions, agreements, or other legally binding instruments." That is why the mitigation measures are scheduled based on the effective date of a new lease amendment.

With regard to contingency measures, it is unclear what specific enforceable measures the District has in mind, and without specific suggestions no further response is required (PRC 21091(d); CEQA Guidelines Section 15204(a)).

Response to Comment SCAQMD-10

The LAHD disagrees with the comment's statement that a number of mitigation measures have been "forgone" and with the comment's characterization of the Revised Project as a "further weakening of the commitment to emissions reductions." The Revised Project proposes to eliminate MM AQ-20, which was not implemented, as discussed in the Recirculated DSEIR (Section 2.5.2.2). It was determined to be infeasible as originally written and was therefore not included in the Revised Project because there is no feasible way to implement it on an individual terminal basis (see RDSEIR Section 2.5.2.2, the Drayage Truck Study, and Response to Comment SCAQMD-11). The remaining air quality measures were partially implemented, and the Revised Project has modified those measures to make them feasible given the state of technology at this time. The LAHD remains committed to achieving all emissions reductions within its authority and consistent with feasible technology. That commitment is clearly articulated in the 2017 CAAP.

Response to Comment SCAQMD-11

In removing MM AQ-20 from the Revised Project, the LAHD recognizes that, contrary to the expectations of the stakeholders in 2008, LNG trucks have not been successfully introduced into the drayage industry in sufficiently large numbers to support a requirement of 100% LNG trucks at any given terminal, and that a different approach is necessary. The LAHD disagrees with the District's statement that the removal of MM AQ-20 shows a lack of commitment to "achieving a zero-emission goods movement future". LNG trucks are not part of a zero-emission environment –they still emit air pollutants in the form of NOx, CO, and CO_2, although at lower rates than diesel trucks and without diesel particulate matter. They were conceived at the time as the best possible approach to reducing drayage truck emissions, but they turned out not to be successful at achieving that goal: as Mr. David Pettit of the Natural Resources Defense Council pointed out (KPCC, 2017), *"It was a huge experiment with public money, well meaning, and it didn't work. This is public money going to private industry to clean up the air pollution that private industry is causing. A lot of money was essentially wasted on subsidizing LNG trucks that were not successful in operation."* The failure to achieve substantial progress towards the goal of 100% LNG trucks reflects the trucking industry's real-world experience with LNG trucks, as highlighted in the KPCC article, and the realities of the goods movement industry, as described in the Drayage Truck Study and summarized in Section 2.5.2.1 of the Recirculated DSEIR.

As discussed in more detail in the Drayage Truck Study, Master Response 2: Zero- and Near-Zero-Emission Technologies, and Master Response 3: Port-Wide Emissions Reduction Programs, an industry-wide solution to drayage truck emissions is needed. The 2017 CAAP outlines that solution – the Clean Trucks Program's proposed fleet-wide transition to near-zero-emission (including LNG technology) and ultimately zero-emission trucks as they become economically and operationally feasible – and commits the ports of Los Angeles and Long Beach to pursuing and implementing that solution.

That commitment includes a schedule: the ports have a goal of achieving zero-emissions drayage operations by 2035. Considering that there are at this time no commercially available zero-emissions trucks capable of heavy-duty drayage operations, this is an ambitious goal; even the goal of a near-zero-emissions truck fleet in the near future is ambitious, given the regulatory and technological uncertainties outlined in the 2017 CAAP (see p. 34) and the enormous expense of replacing the older trucks. The District's comment suggests an even more aggressive schedule of zero-emissions by 2029 but does not provide any information on how to accomplish that goal.

Please note that the comment's statement that "LNG-fueled trucks made only six percent of truck calls operated by WBCT, including the Revised Project" is inaccurate: WBCT did not operate any trucks because it is a container terminal operating firm, not a trucking firm or licensed motor carrier (see also the letter from E. Wise to J. Sidley, March 25, 2015, which reiterates that "neither WBCT nor China Shipping provides over the road trucks or trucking services" [cited in footnote 94 of NRDC's comment letter as "Attachment 33 at POLA000995]). As described in the Drayage Truck Study, decisions about which trucks are sent to the WBCT-operated terminals are made by third parties. The percentage of LNG-fueled trucks servicing any given terminal is a product of those decisions and is out of WBCT's control.

Response to Comment SCAQMD-12

The comment suggests the inclusion of additional measures for facilitating the development of zero-emission trucks. The suggested measures are essentially the same, and would serve the same purposes, as those measures that are already included in the Recirculated DSEIR. A preferential access system for clean trucks (LM AQ-2 Priority Access for Drayage) would incentivize contracting with cleaner truck fleets. The establishment of an air quality fund (essentially, LM GHG-1 GHG Credit Fund) would be aimed at paying for emission reductions in the project vicinity. In addition, please note that the Clean Truck Program will impose fees on drayage trucks that do not meet the CARB's near-zero emission standard, once that is promulgated. Note also that the Port funds the Technology Advancement Program, some of the goals of which are consistent with the District's suggestion. Finally, the Port already funds the Port Community Mitigation Fund that is used to mitigate direct port impacts as consistent with the restrictions placed on the use of public trust funds for off-port purposes (summarized in a letter from J. Lucchesi, State Lands Commission, to Meghan Reese, Harbor Community Benefit Foundation, December 6, 2017).

Response to Comment SCAQMD-13

As the high compliance rates in the AMP data cited by the comment show, shipping lines are clearly making good faith efforts to achieve up to 100% compliance at the CS Terminal. A close look at the data in Table 2-1 of the Recirculated DSEIR shows, however, that they are not able to do so consistently – in 2015 the compliance rate was 94%, the highest compliance rate, in 2016, was 99%, and compliance fell to 96% in 2017. The Recirculated DSEIR (Section 2.5.2.1) discusses the reasons why requiring 95% is appropriate.

The 2017 CAAP (Section 1.5) also discusses the State's goal of achieving 100% compliance and outlines existing programs and future initiatives that the Port will undertake to increase compliance. However, the Ports have pointed out in their comment on CARB's proposed measure on at-berth emissions (POLB and POLA, 2019) that the CARB's requirement to control 100% of vessels calls is not realistic. They point to the likelihood of redundant systems with severe physical challenges, they predict costs in the hundreds of millions of dollars with minimal emissions benefits, and they do not believe that whatever implementation scenario is chosen can be implemented within CARB's proposed deadlines. A compliance requirement of 95% is consistent with both POLA practice and the constraints to higher compliance rates due to emergencies and third-party vessels that are not AMP capable as discussed in the Recirculated DSEIR, and thus represents all feasible mitigation.

With respect to the suggestion that mitigation go into effect on the date of the FSEIR's certification, please refer to Response to Comment SCAQMD-9. With respect to a mitigation fee for non-compliance, please refer to Response to Comment CFASE-9.

Response to Comment SCAQMD-14

As the high compliance rates in the VSRP data cited by the comment show, shipping lines calling at the CS Terminal have approached 98% compliance at the 40 nm limit. However, MM AQ-10's required compliance rate of 100% has not been consistently achieved, particularly in the 20-40 nm zone, where compliance between 2012 and 2018 was often less than 95% for the major shipping lines (compliance rates of China Shipping vessels were consistently among the highest of the major lines). The Recirculated DSEIR (Section 2.5.2.1) discusses why requiring 95% is appropriate, and further points out that the effects on public health and air quality of a non-compliance rate of 5% are negligible. The 2017 CAAP (Section 1.4) also discusses constraints to achieving 100% compliance, and outlines the Ports' existing programs and future initiatives to increase compliance in the 20-40 nm zone. Based on the most recent data for 2017 and 2018 (see https://www.portoflosangeles.org/environment/air-quality/vessel-speed-reduction-program), the average compliance rate at the 40 nm limit for shipping lines calling at the Port has been approximately 85%. The Port of Long Beach's average compliance rate in 2017 was 91% (see http://www.polb.com/environment/air/greenflag.asp). A compliance requirement of 95% is consistent with both POLA practice and the constraints to higher compliance rates discussed in the 2017 CAAP and the Recirculated DSEIR and represents all feasible mitigation.

With respect to the suggestion that mitigation go into effect on the date of the FSEIR's certification, please refer to Response to Comment SCAQMD-9. With respect to a mitigation fee for non-compliance, please refer to Response to Comment CFASE-9.

Response to Comment SCAQMD-15

The phase-in dates for ultra-low NOx/near-zero-emissions yard tractors set forth in MM AQ-15 are the result of careful study by the LAHD, considering both the availability of the technology and the financial implications of replacing existing yard tractors at the CS Terminal that have substantial useful life left. Changes to MM AQ-15 require replacement of model years 2007 or older no later than one year after the effective date of a new lease amendment. This immediate turnover is tied to the useful life of the yard tractors that are in use at the CS Terminal and could, as a recent technology review by the LAHD's consultant suggests, be due as early as 2020. As described in that review, the Port's consultants contacted manufacturers of yard tractors to ascertain the availability of units equipped with any of several LNG or CNG-fueled engines CARB-certified to meet the 0.02 g/bhp-hr standard. As of 2017, no such units had actually been deployed, but the two manufacturers involved in near-zero-emission yard tractor production (TICO and Capacity) expressed confidence that an engine such as the Cummins Westport 6.7-liter ISL G Near-Zero engine would be readily adaptable to their tractor models. Cummins

Westport stated that large-scale production of that engine awaited a substantial demand, which had not yet appeared. The survey concluded that units might be available in adequate quantities to support a fleet replacement effort starting in 2020 to 2022, depending on the availability of the engine.

Please see Master Response 2: Zero- and Near-Zero-Emission Technologies, which discusses the feasibility of zero-emission technology in the port environment, and Response to Comment SCAQMD-3, which explains the problem with requiring unproven technologies as CEQA mitigation. The LAHD believes that it would be imprudent to require replacement of existing tractors with zero-emission yard tractors "within one year of Final SEIR certification" because there is no assurance that such tractors would be commercially available, let alone in sufficient quantities, by that time. As noted in the master response and in the 2017 CAAP, zero-emission technologies suitable for the container terminal environment are not, contrary to the comment's assertion, "commercially available for deployment today".

Given the uncertainty of the availability of near-zero- and zero-emissions yard tractors and the amount of remaining useful life on MY 2011 and newer yard tractors, the LAHD has determined that the phase-in schedule required by MM AQ-15 is the most aggressive feasible mitigation. The phase-in schedules in MM AQ-15 ensure that substantial emission reductions are achieved in the near term while zero emissions technologies mature sufficiently. As the Recirculated DSEIR explains (Section 2.5.2.1), the longer-term goal, supported by LM AQ-1, LM AQ-3, and LM AQ-22, is to convert the CS Terminal to zero-emission technology by 2030, consistent with the goal of the 2017 CAAP.

Please note that the federal ozone attainment deadline is completely unrelated to the feasibility of a particular technology; using that deadline as the basis for a mitigation measure's schedule could very well result in future non-compliance.

Response to Comment SCAQMD-16

The District's concern over the phase-in schedule for CHE is noted, but the reasons for that schedule were clearly explained in the Recirculated DSEIR (Section 1.2.4.2 and Section 2.5.2.1). To summarize, much of the CHE in service at the CS Terminal has considerable useful life remaining, and scrapping those units immediately and replacing them with more expensive Tier 4-compliant units would be prohibitively expensive. Nevertheless, MM AQ-17 does incorporate the need to achieve the objectives of the 2017 CAAP and of the original 2008 EIS/EIR with respect to reducing CHE emissions as soon as practicable. As stated on p. 2-20 of the Recirculated DSEIR, "The replacement schedule for CHE incorporated the useful economic service life of the existing equipment and the high capital costs (e.g., $650,000 per unit for toppicks; LAHD 2014) but accelerated the replacement." (Note that the citation LAHD 2014 in the Recirculated DSEIR has been changed to LAHD, 2016 in the FSEIR [p. 3-9].)

Please note that arbitrarily speeding up phase-in schedules for a mitigation measure is inadvisable, since phase-in cannot occur faster than equipment is proven and available in adequate numbers (please see Master Response 2: Zero- and Near-Zero Emission Technologies, for a discussion of the potential availability of such equipment for in-use deployment).

As stated in the Recirculated DSEIR and Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures, LAHD implements mitigation measures on container terminal projects by including them in leases with its tenants. Since the tenant never signed the new lease, the 2008 mitigation measures were not included in the tenant's lease and could not be enforced by the LAHD. This situation applies to MM AQ-17, which, as the comment points out, required the tenant to participate in a one-year electric yard tractor pilot project. As stated in Table 2-1 of the Recirculated DSEIR, this pilot project was not implemented by the tenant, and the LAHD could not enforce this requirement through the tenant's lease. Section 2.5.2.2 of the Recirculated DSEIR includes a new lease measure, LM AQ-3, that, unlike MM AQ-17's yard tractor pilot project, calls for a one-year demonstration project with at least ten units of zero-emission cargo handling equipment along with feasibility assessments in 2020 and 2025, all leading to a goal of 100% zero-emission cargo handling equipment by 2030. This new lease measure is more robust than the original pilot project in MM AQ-17 and, like all other measures, would be implemented once a lease amendment occurs.

Response to Comment SCAQMD-17

Although low NO_x 18-ton forklifts are not currently commercially available (see Master Response 2: Zero- and Near-Zero Emission Technologies), please note that LM AQ-1: Cleanest Available Cargo Handling Equipment would ensure that, if available emissions control technology that exceeds the requirements of MM AQ-17 (e.g., low-NO_X or zero-emissions) is available at the time of equipment replacement, the CS Terminal would be required to purchase 18-ton forklifts with that technology.

With respect to the suggestion that the replacement schedule for 5-ton and 18-ton forklifts be related to the date of the FSEIR's certification, please refer to Response to Comment SCAQMD-9.

Response to Comment SCAQMD-18

As described in the Recirculated DSEIR (p. 2-19), the replacement schedule for toppicks/top handlers reflects the economic realities of replacing units with significant remaining useful life, given how expensive toppicks are ($650,000 for conventional units [Recirculated DSEIR p. 2-20], likely more for units with advanced emissions control). The schedule is based upon China Shipping's representations to the LAHD of replacement costs, as described in the Recirculated DSEIR (p. 2-19). Please note, too, that LM AQ-1: Cleanest Available Cargo Handling Equipment would ensure that, if available emissions control technology that exceeds the requirements of MM AQ-17 (e.g., low-NO_X or zero-emissions) is available at the time of equipment replacement, the CS Terminal would be required to purchase that technology.

Response to Comment SCAQMD-19

As described in the Recirculated DSEIR (p. 2-19 and p. 2-21), the replacement schedule for RTGs reflects both the economic realities of replacing units with significant remaining useful life, as represented to the LAHD by China Shipping, and the constraints to deploying all-electric units in most of the CS Terminal. MM AQ-17 would begin replacing diesel-powered cranes within three years of a new lease amendment, and by 2030 the RTG fleet would be electrified to the extent allowed by the CS Terminal's configuration.

Response to Comment SCAQMD-20

As described in the Recirculated DSEIR (p. 2-19 and p. 2-20), the replacement schedule for sweepers reflects the economic realities of replacing units with significant remaining useful life, as represented to the LAHD by China Shipping. With respect to the suggestion that the replacement schedule for sweepers be related to the date of the FSEIR's certification, please refer to Response to Comment SCAQMD-9.

Response to Comment SCAQMD-21

As described in the Recirculated DSEIR (p. 2-19 and p. 2-20), the replacement schedule for shuttle buses reflects the economic realities of replacing units with significant remaining useful life, as represented to the LAHD by China Shipping. With respect to the suggestion that the replacement schedule for shuttle buses be related to the date of the FSEIR's certification, please refer to Response to Comment SCAQMD-9.

Response to Comment SCAQMD-22

A demonstration program for OGV retrofits would not result in substantial reductions of ongoing emissions, since at most two or three vessels would be involved. Such demonstrations have been undertaken in the past, and as described in the 2017 CAAP (sections 1.6 and 1.7) the ports continue to work with the shipping industry on reducing vessel emissions. Substantial emissions reductions can only be achieved by actions at the fleet level. Because the ports have no control over cargo vessels, the 2017 CAAP adopted the Clean Ship Program, which uses financial incentives to encourage deployment of cleaner vessels (i.e., those with Tier 2 and Tier 3 engines) to the San Pedro Bay area in higher numbers than would otherwise be the case and to discourage calls by Tier 0 vessels.

Furthermore, the 2008 EIS/EIR included, aside from the VSRP, four OGV mitigation measures, MM AQ-11 through AQ-14, that were aimed at requiring the use of low sulfur fuel and slide valves on main engines, and at encouraging the rerouting of cleaner ships and new vessel builds, since neither the Port nor the tenant has any direct control over the deployment and purchasing of vessels. These four OGV measures are not included in the SEIR because they would not be removed or modified as part of the Revised Project. In addition, MM AQ-14 New Vessel Builds already targets future technologies to reduce criteria pollutant emissions (NO_X, SO_X and PM) and GHG emissions from vessels through design considerations, which is consistent with the comment's suggestion.

Finally, CEQA does not require that a supplemental EIR for proposed changes to a previously approved project assess mitigation to reduce or avoid impacts of the project that occurred prior to approval of the proposed change. Nevertheless, for informational purposes only, the Recirculated DSEIR does disclose emissions that occurred between 2008 and the present due to incomplete implementation of mitigation from the 2008 EIS/EIR (see Table 3.1-11.) See also Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures.

Response to Comment SCAQMD-23

The comment has extrapolated from the figures for two months presented in the cited article to characterize WBCT's turn times as the worst in San Pedro Bay. Drayage truck turn times vary substantially from month to month at all terminals, largely as a result of short-term variations in cargo volumes, although also reflecting various other time-varying factors as well as different terminal configurations and operating modes (e.g., wheeled versus stacked). Accordingly, two months of data provide a very poor indication of overall performance for any terminal and should not be the basis for mandating a mitigation measure. The actual GeoStamp data used in the cited article (Harbor Trucking Association, 2018) shows that in 33 of the 48 months over the four-year period ending December 2018 WBCT's turn times were below the bay-wide monthly average, and for the entire period the average turn time was the same as the bay-wide average (GeoStamp data provided by POLA, January 2019).

Please note, too, that turn times are not the same as idling times. Idling refers to the amount of time a truck is stationary on the terminal waiting to enter, leave, or be loaded/unloaded. Turn times are the total amount of time a truck spends on a transaction at a terminal. Data from the Port's annual emissions inventories, which track truck and equipment activity, indicate that WBCT, including the CS Terminal, was in compliance with MM AQ-21 between 2008 and 2014.

Nevertheless, the Recirculated DSEIR contains a measure (LM AQ-2 Priority Access for Drayage) aimed at improving the turn times of zero- and near-zero emissions trucks at the WBCT. While focused on a limited class of trucks, the measure is expected to have a beneficial effect on turn times at that terminal. However, long turn times at container terminals are a serious, port-wide issue that cannot be resolved by the piecemeal application of mitigation measures at individual terminals. Recognizing that problem, the goods movement industry, including the Port, has developed several port-wide programs aimed at improving supply chain efficiency, with the concomitant benefit of improving container terminal turn times. These include:

- E-Dray, a port logistics management collaborative that, among other things, allows shippers and trucking companies to improve the efficiency of drayage activities by matching up containers, shippers, and truckers in real time and by managing in-terminal container storage to minimize truck waiting times (www.edray.com);
- Port Optimizer (https://www.portoflosangeles.org/business/supply-chain/port-optimizer™), which is a partnership between the Port and GE Transportation that provides real-time supply chain data such as vessel arrival times and loading details, empty container logistics, and cargo volume forecasts; and
- the Off-Terminal Chassis Depot program, currently being developed by the Port, that will provide a centralized pool of empty chassis for use by the container terminals in both ports.

These port-wide programs, along with other collaborative efforts among elements of the goods movement industry, will help improve the efficiency of drayage operations at the Port. As the District's comment does not contain any specifics on what a mitigation measure aimed at turn times would include, no further response is required (PRC 21091(d); CEQA Guidelines Section 15204(a)).

Finally, CEQA does not require that a supplemental EIR for proposed changes to a previously approved project assess mitigation to reduce or avoid impacts of the project that occurred prior to approval of the proposed change. Nevertheless, for informational purposes only, the Recirculated DSEIR does disclose emissions that occurred between 2008 and the present due to incomplete implementation of mitigation from the 2008 EIS/EIR (see Table 3.1-11.) See also Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures and Master Response 5: Comparative Emissions.

Response to Comment SCAQMD-24

The LAHD acknowledges that the Revised Project's health risk impacts will be significant in comparison to the floating future baseline, and that impacts under the FEIR Mitigated Scenario would be less than significant in comparison to the floating future baseline, as is disclosed in the Recirculated DSEIR. However, as the Recirculated DSEIR explains (Section 3.1.4.4, Impacts AQ-3 and AQ-8), no additional feasible mitigation is available to apply to the Revised Project (see also Master Response 1: Feasible Mitigation – Guidance and Applicability). With respect to the comment's characterization of the Revised Project's mitigation measures as "less stringent", please see Response to Comment SCAQMD-3. The comment recommends that the Port provide additional mitigation measures but offers no suggestions as to what those might be; accordingly, no further response is required (PRC 21091(d); CEQA Guidelines Section 15204(a)).

Response to Comment SCAQMD-25

The comment recommends that additional mitigation be provided on the basis that "it is likely that the Port has underestimated health risks." CEQA does not require that mitigation be imposed for a speculative assumption. As explained below, the LAHD has determined that the analyses in the Recirculated DSEIR were correct and that health risks were not underestimated.

In the Recirculated DSEIR, locomotives were modeled in AERMOD as non-buoyant line sources. The dispersion algorithms used by AERMOD for non-buoyant line, area, and volume sources have no allowance for plume rise (EPA, 2018a). This means that when applying the atmospheric conditions to emissions from those sources to predict their downwind dispersion, AERMOD assumes the emission plumes have zero upward momentum and neutral buoyancy. Therefore, for non-buoyant line, area, and volume sources, it is appropriate to manually adjust the vertical starting point for a plume in cases where momentum- and buoyancy-related plume rise is expected.

Because locomotives release their exhaust with upward momentum and thermal buoyancy, AERMOD's source heights were manually adjusted upward to equal the expected plume heights instead of the locomotive exhaust port heights. This same approach was used in health risk assessments for 17 major railyards prepared between 2007 and 2009 pursuant to the 2005 Statewide Railyard Agreement (CARB, 2013). For example, the analysis for the Dolores and ICTF Rail Yards (UPRR, 2007; Table 92), which was reviewed and approved by CARB, used AERMOD source heights identical to those used in the Recirculated DSEIR for off-site locomotives (Table B2-1).

The commenter states that AERMOD "already accounts for the diurnal [meteorological] patterns" when modeling the locomotive emissions as a line source, and therefore a manual adjustment to the source height is taking double credit for plume rise. That is not correct because, as stated above, the AERMOD line-source algorithm assumes no plume rise due to upward momentum or thermal buoyancy; it only accounts for diurnal variations. While diurnal meteorological patterns do affect the degree to which a plume disperses as it is carried downwind from the source, they do not have any effect on the starting height of the plume centerline.

The method for determining plume heights for moving locomotives was first developed by CARB in the Roseville Rail Yard Study (CARB, 2004). At that time, the approved regulatory dispersion model was ISCST3. However, the principle of adjusting a non-buoyant source height upward to equal the plume height is the same whether the dispersion model is ISCST3 or its successor, AERMOD. CARB accounted for the differences in atmospheric stability between daytime and nighttime conditions (specifically, the effects of stability on plume rise) to calculate different daytime and nighttime locomotive plume heights. As a result, different AERMOD source heights were used in the Recirculated DSEIR for daytime versus nighttime. Without this adjustment, the pollutant concentrations predicted by AERMOD for locomotives would have been overstated because the modeled exhaust plumes would have been too low. Therefore, pollutant concentrations were appropriately predicted, health risks have not been understated, and additional mitigation measures are not warranted.

As explained above, a source height adjustment for non-buoyant AERMOD sources is appropriate when plume rise is expected. Accordingly, health risks were not underestimated and additional mitigation measures are not warranted.

With respect to the other sources in Table B2-1, the volume source heights for ships in transit, turning, and docking were obtained from the Recirculated Draft EIS/EIR for the Berth 97-109 [China Shipping] Container Terminal Project (LAHD, 2008). They are based on a series of visual observations of containership exhaust plumes near the Port of Los Angeles (SAIC 2006). The average plume heights were estimated to be 25 percent above vessel stack height for fairway and precautionary area transit, 50 percent above vessel stack height for harbor transit, and 100 percent above vessel stack height for turning and docking. The higher plume rise at slower ship speeds is the result of lower apparent (i.e., actual plus vessel motion) wind speeds. The resulting modeled plume heights, which range from 49.1 to 78.6 m above water, as shown in Table B2-1, agree reasonably well with the limited published literature that could be found, such as Liu et al. (2000) (240-300 m above water), CARB (2006) (50 m above water), Frick and Hoppel (2000) (200 m above water), Beecken et al. (2014) (50-70 m above water), and Murphy et al. (2009) (30-55 m above water). The volume source height for ships at anchorage was conservatively set at 44.5 m, which is the auxiliary engine stack height, because there was no visual plume observation made for ships at anchorage.

The methodologies for adjusting the line and area source heights for the remaining source types in Table B2-1 are as follows. The average plume heights above water or ground for tugboats, cargo handling equipment, and trucks were estimated through visual observations by Port staff to be 50 feet (15.2 m), 15 feet (4.57 m), and 15 feet (4.57 m), respectively (LAHD, 2008). These heights account for the exhaust port height plus a nominal amount of plume rise due to thermal buoyancy and upward momentum. The source height for rubber-tired gantry (RTG) cranes of 41 feet (12.5 m) is the average exhaust port height, provided by equipment manufacturers as reported by UPRR (2007). The source height for worker vehicles of 2 feet (0.61 m) is based on the CARB Risk Reduction Plan (CARB, 2000) and recommendations from ARB staff, as reported in Appendix C2 of the Southern California International Gateway Project FEIR (LAHD, 2013c).

To determine the initial vertical dimension (σz0) for a volume or line source, Table 3-2 of the AERMOD User's Guide (EPA, 2018a) recommends that the vertical dimension of the source be divided by 2.15 for a surface-based source or elevated source on or adjacent to a building, or by 4.3 for an elevated source not on or adjacent to a building. The commenter contends that the σz0 for a locomotive source should equal the "…release height, divided by 4.3", which implies that the commenter considers a locomotive volume source to be an elevated source not on or adjacent to a building. However, the source descriptions in Table 3-2 of the AERMOD User's Guide leave room for interpretation. For example, one might consider a locomotive volume source to be a surface-based source since the locomotive is in contact with the ground. Or one might consider it to be an elevated source on or adjacent to a building, where the "building" is the locomotive itself. In either of those two cases the denominator in the calculation of σz0 would be 2.15 rather than 4.3.

Moreover, the AERMOD User's Guide says the "vertical dimension of source", not the "release height", should be divided by 4.3. Professional judgment is required in estimating the "vertical dimension of the source". For example, one possible interpretation would be to assume that the "source" means the plume, and the vertical dimension of the source would be twice the release height since one would expect the plume to disperse roughly equal distances both below and above the plume centerline (i.e., the plume would spread from the plume centerline down to the ground, a distance equivalent to one release height, and simultaneously it would also spread upward from the plume centerline a similar distance equivalent to one release height). Using this interpretation would result in σz0 = 2 × Release Height ÷ 4.3, which is equivalent to σz0 = Release Height ÷ 2.15. Given the subjectivity involved in this determination, the Port deferred to regulatory agency precedent for locomotives. Therefore, as documented in the Roseville Rail Yard Study (CARB, 2004 p. 40) and Table 7 of the Diesel Particulate Matter Exposure Assessment Study for the Ports of Los Angeles and Long Beach (CARB, 2006), σz0 for locomotives was set equal to the release height divided by 2.15.

Response to Comment SCAQMD-26

The LAHD agrees with the District that the analysis of OGV peak-day emissions related to MM AQ-9 that was presented in the Recirculated DSEIR was unclear. The analysis has been revised in the Final SEIR to present the peak-day emissions for OGVs at berth under the Revised Project scenario for years 2023-2045 without AMP usage, to reflect the difference in mitigation against the FEIR Mitigated scenario peak-day OGV emissions at-berth, which are assumed to use AMP. This would result in an increase in peak daily emissions of years 2023-2045 for the Revised Project, which have been updated in Tables 3.1-9 and 3.1-11 (see Section 3.2.3.1 of the FSEIR). Peak daily emissions in the Recirculated DSEIR for years 2008-2018 did not require updating; the annual emissions in the Recirculated DSEIR reflected the difference in mitigations between the FEIR Mitigated and Revised Project. Please note that these Final SEIR revisions only affect 24-hour and hourly emissions for years 2023-2045 of the Revised Project. The increase in emissions due to these revisions does not change the impact findings for operational emissions (Impact AQ-3) as shown in Table 3.1-9.

In view of an increase in peak daily emissions for years 2023-2045 under the Revised Project, their effect on criteria pollutant concentrations was evaluated to confirm if findings for Impact AQ-4 would change in the Final SEIR. Remodeling analysis found the 24-hr $PM_{2.5}$ concentration increment, as well as other pollutant concentrations for years 2023-2045 evaluated in AQ-4, to have a negligible increase related to the updates, and therefore no additional impacts were found for the Revised Project in the Final SEIR. Because there are no additional impacts, additional mitigation, even if it were available, would not be required.

Response to Comment SCAQMD-27

The LAHD disagrees with the suggestion of updating the assumed percent of drayage truck trips fueled with LNG in the SEIR's air quality analysis from 2014's average (8.2%) to 0%. There is evidence from past years' Port activity (LAHD, 2015 p. 52) that a small percentage of the fleet coming to the CS Terminal is LNG-fueled, so there is no basis to assume it would be zero in the future. The LAHD expects that the percentage of drayage trucks in the Port's fleet using non-diesel technologies (including LNG) will increase once that technology becomes commercially and operationally feasible and through the support of the port-wide strategies in the CAAP. The SEIR, however, cannot take credit for potential increases in the number of LNG trucks in the Port-wide fleet and there are no feasible terminal-specific measures to transform the drayage fleet, as explained in Response to Comment SCAQMD-11.

Response to Comment SCAQMD-28

The LAHD disagrees with the statement that the 2016 AQMP did not take the Revised Project into account. As the Recirculated DSEIR states (p. 3.1-79), "LAHD regularly provides SCAG with its Port-wide cargo forecasts for development of the AQMP. Therefore, the attainment demonstrations included in each AQMP account for the emissions generated by projected future growth at the Port. Because the forecasted throughput of the Revised Project is included in the Port-wide projections provided to SCAG (SCAG, pers. comm. 2018), the Revised Project cargo forecast and related emissions are included in the General Conformity budgets established in the Final 2016 AQMP (SCAQMD, 2017). The Revised Project would be considered consistent with the local AQMP and not interfere with attainment goals given that the Revised Project's activities (e.g. cargo throughput, ship berths) are consistent with the projections utilized in the formulation of the AQMP." The analysis also concludes that the Revised Project's compliance with the applicable SCAQMD mobile-source rules would ensure that it would not obstruct implementation of the AQMP.

Furthermore, it is important to note that the AQMP is not based upon mitigation commitments from specific projects analyzed under CEQA, and in fact neither the CS Terminal nor the Approved Project is referenced anywhere in the 2016 AQMP. Rather, the 2016 AQMP emissions inventory is based on CARB regulatory models and databases using existing fleet information; technologies based on the current fleet and the future effects on that fleet of adopted rules and regulations; and regional and sub-regional growth forecasts, including growth at the ports. Appendix III of the 2016 AQMP describes the emission inventories and the development process for mobile sources, including trucks, ships, cargo handling equipment and other port-related sources. Appendix III indicates that new engines and equipment are cleaner in the future as a result of adopted rules and regulations, and that normal fleet turnover reduces on- and off-road mobile NOx emissions and tailpipe diesel $PM_{10}/PM_{2.5}$ monotonically from 2012 through 2031.

There is no indication that advanced-technology project mitigation commitments are included in the projected AQMP baseline inventories. For example, near-zero- and zero-emission trucks (other than certain refuse trucks) are not included in the base year or future baseline inventories. To the extent that 2016 AQMP control measures affect port-related sources, they would also affect the sources at the CS Terminal, regardless of project mitigation measures. Thus, the 2016 AQMP does not rely upon emission reductions from those mitigation measures, and those measures do not affect the 2016 AQMP control strategy. No further analysis related to AQMP consistency beyond that already provided in the Recirculated DSEIR is necessary.

CEQA does not require that a supplemental EIR for proposed changes to a previously approved project assess mitigation to reduce or avoid impacts of the project that occurred prior to approval of the proposed change. Nevertheless, for informational purposes only, the Recirculated DSEIR does disclose emissions that occurred between 2008 and the present due to incomplete implementation of mitigation from the 2008 EIS/EIR (see

Table 3.1-11.) See also Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures.

Response to Comment SCAQMD-29

Please see Master Response 2: Zero- and Near-Zero-Emission Technologies and Response to Comment SCAQMD-11. This comment appears to be a compilation of ongoing pilot and demonstration projects and concept development efforts related to zero-emission truck technologies, none of which appears to be nearing completion. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

2.3.2.3 City of Los Angeles Bureau of Sanitation

FORM GEN. 160 (Rev. 6-12)

CITY OF LOS ANGELES

INTER-DEPARTMENTAL CORRESPONDENCE

CITY OF LOS ANGELES
OCT 26 2018
ENV MGMT DIV
HARBOR DEPARTMENT

DATE: October 22, 2018

TO: Christopher Cannon, Director of Environmental Management
Los Angeles Harbor Department

FROM: Ali Poosti, Division Manager
Wastewater Engineering Services Division
LA Sanitation and Environment

SUBJECT: **BERTHS 97-109 [CHINA SHIPPING] CONTAINER TERMINAL PROJECT - NOTICE OF AVAILABILITY OF A RECIRCULATED DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT**

BOS.1-1 This is in response to your October 2, 2018 Notice of Availability of a Recirculated Draft Supplemental Environmental Impact Report for the proposed Improvement project located at Berths 97-109 at the Port of Los Angeles, San Pedro, CA 90731. LA Sanitation, Wastewater Engineering Services Division has received and logged the notification. Upon review, it has been determined that the project is unrelated to sewers and does not require any hydraulic analysis. Please notify our office in the instance additional environmental review is necessary for this project.

If you have any questions, please call Christopher DeMonbrun at (323) 342-1567 or email at chris.demonbrun@lacity.org

CD/AP:sa

c: Kosta Kaporis, LASAN
Cyrous Gilani, LASAN
Christopher DeMonbrun, LASAN

File Location: CEQA Review\FINAL CEQA Response LTRs\FINAL DRAFT\Berth 97-109 [China Shipping] Container Terminal Project - NOA of a Recirculated dsEIR.doc

FORM GEN. 160 (Rev 8-12)

CITY OF LOS ANGELES

INTER-DEPARTMENTAL CORRESPONDENCE

CITY OF LOS ANGELES
NOV 27 2018
ENV MGMT DIV
HARBOR DEPARTMENT

DATE: November 19, 2018

TO: Christopher Cannon, Director of Environmental Management
Los Angeles Harbor Department

FROM: Ali Poosti, Division Manager
Wastewater Engineering Services Division
LA Sanitation and Environment

SUBJECT: **BERTHS 97-109 [CHINA SHIPPING] CONTAINER TERMINAL PROJECT - REVIEW PERIOD NOTICE OF RECIRCULATED DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT**

BOS.2-1 This is in response to your October 11, 2018 Review Period Notice of Recirculated Draft Supplemental Environmental Impact Report for the proposed improvement project located at Berths 97-109 at the Port of Los Angeles, San Pedro, CA 90731. LA Sanitation, Wastewater Engineering Services Division has received and logged the notification. Upon review, there were no changes to the project and the previous response is valid. Please notify our office in the instance that additional environmental review is necessary for this project.

If you have any questions, please call Christopher DeMonbrun at (323) 342-1567 or email at chris.demonbrun@lacity.org

CD/AP: mg

c: Kosta Kaporis, LASAN
Cyrous Gilani, LASAN
Christopher DeMonbrun, LASAN

File Location: CEQA Review\FINAL CEQA Response LTRs\FINAL DRAFT\Berth 97-109 [China Shipping] Container Terminal Project - Review Period Notice of Recirculated dsEIR.doc

Response to Comment BOS.1-1 and BOS.2-1

The Bureau's determination that the Revised Project is unrelated to its jurisdiction is noted. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

2.3.2.4 Citizens for a Safe Environment

Coalition For A Safe Environment
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November 16, 2018

City of Los Angeles Harbor Department
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NOTE: The attachment "Commercial Status..." is CFASE 23 and the "Wilmington Container..." is CFASE 24.

Re: Recirculated Draft Supplemental Environmental Impact Report (DSEIR)
Berths 97-109 China Shipping Container Terminal Project 2018
SCH No. 2003061153, APP No. 150224-504

Su: Submission of Public Comments Regarding The Recirculated Draft Supplemental Environmental Impact Report (RDSEIR) Berths 97-109 China Shipping Container Terminal Project

The Coalition For A Safe Environment (CFASE) and et all undersigned organizations and individuals wish to submit the following public comments on the Recirculated Draft Supplemental Environmental Impact Report (RDSEIR) Berths 97-109 China Shipping Container Terminal Project

1. **POLA must have a signed contract with a shipping company operator of the China Shipping Terminal.**

CFASE-1

The Port of Los Angeles must immediately cease operation of the China Shipping Terminal for failure to have a signed long term lease agreement. A month-to-month lease or MOU is not acceptable for compliance with CEQA requirements for assurance of completion of adopted Mitigation Measures.

2. **The RDSEIR fails to include a Zero Emissions Heavy-Duty Truck Mitigation Measure**

CFASE-2

The RDSEIR fails to include a Zero Emissions Heavy-Duty Truck Mitigation Measure. There are currently available Zero Emission Class 8 Drayage Trucks that can service all short-haul requirements of less 100 miles. Long-haul trucks will be available in 2019. A Mitigation Measure should include immediate ZE Heavy Duty Short-Haul Truck Phase-In Plan for less than 100 miles beginning in 2019 and ending in 2024 and a Long-Haul Truck Phase-In Plan for more than 100 miles beginning in 2020 and ending in 2025. See Attachment.

CFASE-2

The POLA has provided no current 2018 information, evidence or research that justifies the non-availability or non-performance of Zero Emission Heavy Duty Drayage Trucks for Mitigation Measures and our proposed schedule. The non-availability of funds for new purchases is the fault of the POLA for its failure to adequately budget for mitigation expenses, schedule the phase-in of new technologies and to charge appropriate container tariffs.

MM-AQ 20 has been removed and should be replaced with our recommended Mitigation Measure and schedule.

CFASE-3

3. **The RDSEIR Discloses That There Will Be An Increase of 296,794 TEU's Above The 2014 Baseline With No Additional Mitigation**

This will result in a 77% increase of TEU's being handled by on-dock rail with no rail Locomotive Mitigation Measure being proposed or Cumulative Impact Mitigation Measures for increased impacts to the Environment, Public Health, Environmental Justice Communities and Disadvantaged Communities. This will be in violation of CEQA requirements, AB 32 and AB617 for the mandatory reduction of all categories of stationary and mobile air pollution sources, greenhouse gases and improvement of public health.

CFASE-4

4. **The Conclusion That There are no Additional Feasible Mitigation For AQ-3, AQ-4, AQ-7 and GHG-1 is Unacceptable.**

The Coalition For A Safe Environment has conducted a Commercial Status Availability Of Zero Emission Trucks, Cargo Handling Equipment Construction Equipment, Specialty Vehicles & Buses Survey which identifies numerous available, feasible technology mitigation which can be incorporated into the SEIR. See Attachment.

5. **Mitigation Measure MM AQ-9 is not acceptable for the following reasons:**

CFASE-5

a. The Mitigation Measure must apply to China Shipping and any other shipping company which is authorized to currently use, plan to use or approved to use the China Shipping Terminal.
b. The Mitigation Measure must mandate that the Port of Los Angeles and China Shipping Terminal Administration be notified by a shipping company a minimum of 30 days in advance of its intent to use China Shipping Terminal and whether the ship is AMP Capable.
c. The RDSEIR failed to disclose that the China Shipping Terminal currently has the shore-power capability of 100% compliance rate by 2019.
d. If the ship vessel is not AMP Capable, An AMP-Capable Berth is Unavailable, An AMP-Capable Ship is Not Able to Plug-In or there is an Emergency the China Shipping Terminal must use an equivalent alternative at-berth emission control capture and treatment system. At this time only one company technology has been certified by the California Air Resources Board that can service all container ships which is the Advanced Environmental Group – AMECS: Advanced Maritime Emissions Control System. This is a 100% feasible and available technology contrary to your conclusion. An order can be placed and delivery within 6-12 months. See attachment.
e. If the China Shipping Terminal or POLA does not have an AMECS or equivalent technology available it shall pay a $ 100 per container tariff. 50% will go towards a fund to purchase additional AMECS or equivalent systems technology and 50% will go to the Harbor Community Benefit Foundation to mitigate all off-port community environmental impacts.

CFASE-5

f. If a ship is not a Container Ship but using the China Shipping Terminal it/POLA shall pay a $ 1.00 per metric ton of cargo tariff. 50% will go towards the POLA Harbor Enforcement Program and 50% will go to the Harbor Community Benefit Foundation to mitigate all off-port community environmental impacts.

CFASE-6

g. It is a fact the AMECS Technology is more efficient in capturing and treating more ship emissions and more cost effective than the POLA's AMP Technology.

CFASE-7

h. The Mitigation Measure must also require the POLA to publish a quarterly Compliance Report.

6. **Mitigation Measure MM AQ-10 is not acceptable for the following reasons:**

CFASE-8

a. The RDSEIR failed to disclose that the China Shipping Terminal achieved a 99% VSRP Participation Rate in 2014 according to POLA data and the goal should now be 100% participation.

CFASE-9

b. Does not contain any penalty for failure to comply with the VSRP.
c. If a Container Ship does not comply with the VSRP available it shall pay a $ 100 per container tariff. 50% will go towards the POLA Harbor Enforcement Program and 50% will go to the Harbor Community Benefit Foundation to mitigate all off-port community environmental impacts.
d. If a ship is not a Container Ship but using the China Shipping Terminal and does not comply with the VSRP available it/POLA shall pay a $ 1.00 per metric ton of cargo tariff. 50% will go towards the POLA Harbor Enforcement Program and 50% will go to the Harbor Community Benefit Foundation to mitigate all off-port community environmental impacts.
e. The Mitigation Measure must also require the POLA to publish a quarterly Compliance Report.

7. **Mitigation Measure MM AQ-15 is not acceptable for the following reasons:**

CFASE-10

a. There are Near Zero Emission Yard Tractors currently available that exceed Tier 4 Final Off-Road Engine standards. These include LPG, CNG and RNG. See CFASE Attachment.
b. There are Zero Emission Yard Tractors currently available that can meet all short haul requirements requirement by 2019. See CFASE Attachment.

CFASE-11

f. There is no penalty for the failure to comply with any schedule. If the China Shipping Terminal/POLA fails to comply it shall pay a $ 100 per container lift tariff. 50% will go towards a POLA fund for new Yard Tractor purchases and 50% will go to the Harbor Community Benefit Foundation to mitigate all off-port community environmental impacts.

CFASE-10

g. The POLA has provided no current 2018 information, evidence or research that justifies the non-availability or non-performance of Zero Emission or Near Emission Yard Tractor Technologies for mitigation and our proposed date. The non-availability of funds for new purchases is the fault of the POLA for its failure to adequately budget for mitigation expenses, schedule the phase-in of new technologies and to charge appropriate container tariffs.

8. **Mitigation Measure MM AQ-16 and Mitigation Measure MM AQ-17 is not acceptable for the following reasons:**

CFASE-12

a. There are Near Zero Emission Cargo Handling Equipment (CHE) currently available that exceed Tier 4 Final Off-Road Engine standards that can meet all requirements requirement by 2019. These include LPG, CNG and RNG. See CFASE Attachment.

CFASE-12

b. There are Zero Emission Cargo Handling Equipment (CHE) currently available that can meet all requirements requirement by 2019. See CFASE Attachment.
c. There are Zero Emission Yard Tractors currently available that can meet all port and railyard requirements by 2019. See CFASE Attachment.

CFASE-13

h. There is no penalty for the failure to comply with any schedule. If the China Shipping Terminal/POLA fails to comply it shall pay a $ 100 per container lift tariff. 50% will go towards a POLA fund for new CHE purchases and 50% will go to the Harbor Community Benefit Foundation to mitigate all environmental impacts.
i. There is no penalty for the failure to comply with any schedule. If the China Shipping Terminal/POLA fails to comply it shall pay a $ 1.00 per metric ton of cargo lift tariff. 50% will go towards the POLA Harbor Enforcement Program and 50% will go to the Harbor Community Benefit Foundation to mitigate all off-port community environmental impacts.

CFASE-12

j. The POLA has provided no current 2018 information, evidence or research that justifies the non-availability or non-performance of Zero Emission or Near Zero Emission CHE Technologies for mitigation and our prosed date. The non-availability of funds for new purchases is the fault of the POLA for its failure to adequately budget for mitigation expenses, schedule the phase-in of new technologies and to charge appropriate container tariffs.

CFASE-14

9. Mitigation Measure LM GHG-1: GHG Credit Fund is Unacceptable

a. As an Environmental Justice Organization which represents EJ Communities in the San Pedro Bay we under no circumstances will accept this mitigation measure of allowing the purchase of credits from CARB or any other GHG Offset Registry. The POLA has failed to conduct an adequate survey of all current available, feasible and cost-effective, CARB Certified/ South Coast AQMD BACT:

- Zero Emission Technologies
- Near Zero Emissions Technologies
- Emission Capture Technologies
- Emission Capture & Treatment Technologies

b. The POLA has provided no current 2018 information, evidence or research that justifies the non-availability or non-performance of Zero Emission, Near Zero Emission, Emissions Capture Technologies, Emissions Capture & Treatment Technologies that can be included as part of the China Shipping Terminal Project or Mitigation.
c. We disagree with the limitations of funds being used only on Port of Los Angeles property when it is a fact that a significant amount of GHGs are generated by the Port, Port Tenants and Tenant Service Providers Off-Port Property which will also cause significant direct and indirect negative community environmental, public health, public safety, community sustainability and socio-economic impacts.
d. GHG Mitigation Funds can be given to the Harbor Community Benefit Foundation to sponsor projects that would reduce GHG environmental and public impacts off-port property.
e. The proposed amount of $ 250,000 is inadequate to mitigate the GHG Environmental and Public Health Impacts. We request a study be completed to determine the costs and Mitigation Measures to address GHG Environmental and Public Health Impacts.

CFASE-15

10. Mitigation Measure LM AQ-1: Cleanest Available Cargo Handling Equipment is Unacceptable

CFASE-15

a. There are Zero Emission and Near Zero Emission Cargo Handling Equipment (CHE) currently available that can meet all requirements requirement by 2019. See CFASE Attachment.
b. There are Zero Emission and Near Zero Emission Yard Tractors currently available that can meet all port and railyard requirements by 2019. See CFASE Attachment.
c. We request that POLA and Tenant create, maintain and update quarterly a Survey of Zero Emissions and Near Zero Emissions Handling Equipment.
d. We have no confidence in the LAHD and Tenant conducting adequate feasibility assessments when they have ignored past public comments identifying Zero Emission, Emission Capture & Control Technologies and BACT and denied currently available, feasible and CARB certified technologies.

CFASE-16

11. Mitigation Measure LM AQ-2: Priority Access System Is Acceptable

CFASE-17

12. Mitigation Measure LM AQ-3: Zero Emissions Equipment Demonstration And Feasibility Assessment is Not Acceptable

a. There are numerous categories of CHE and we request that that when available Tenant shall conduct a minimum of three zero emission demonstrations of each category of CHE.
b. We request that beginning in 2019 all available ZE CHE be identified annually.
c. We request that beginning in 2019 all ZE CHE that has passed all demonstration/test requirements and/or certified by CARB be published annually.
a. The proposed goal of 2030 is not acceptable. CFASE proposes our CAAP Freight System & Technologies recommended transition schedule:

25% by 2020 50% by 2023 100% by 2025

CFASE-18

13. SDEIR fails to identify, assess and mitigate all truck, container and chassis negative impacts from Truck, Container & Chassis Points of Origin to all Port and Tenant destinations.

We disagree to POLAs determination that Air Quality Impacts are Less Than Significant because the POLA has not identified and has significantly underestimated air emissions and greenhouse gases from Port and Tenant Freight Transportation Destinations.

These negative impacts include but are not limited to: increased traffic congestion, increased air pollution, increased greenhouse gasses, increased noise, increased ground and street contamination, diversion of city services when there are truck accidents, increased public infrastructure damage, increased public health and safety impacts. These origins and destinations include as a minimum:

- Truck Points of Origin. Throughout Los Angeles, Orange County, Inland Empire etc.
- On/Off Tidelands Property Truck Container/Flat Bed Inspection Facilities.
- On/Off Tidelands Property Container Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Container/Flat Bed Chassis Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Chassis 40’ to 53’ Modification, Cutting, Welding & Painting Facilities
- On/Off Tidelands Property TRU/Genset Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Truck Storage Yards, Staging, Maintenance & Repair Facilities.
- On/Off Tidelands Property Yard Tractor Storage Yards, Maintenance & Repair Facilities.

CFASE-18

- On/Off Tidelands Property Container Fumigation Facilities.
- On/Off Tidelands Property Container Transloading Facilities.
- On/Off Tidelands Property Truck Fueling Facilities: Diesel, Natural CNG, LNG, Hydrogen.
- On/Off Tidelands Property Truck Yard Tractor Fueling Facilities: Diesel, Natural CNG, LNG, Hydrogen.
- On/Off Tidelands Property Truck Electrical Charging Stations.
- On/Off Tidelands Property Truck Yard Tractor Fueling Facilities.
- On/Off Tidelands Property Peel-Off Yards.

CFASE has conducted a survey of Container Storage Yards in Wilmington and has identified 117 locations. See CFASE Attachments.

14. SDEIR fails to identify, assess and mitigate all Cumulative Impacts.

CFASE-19

The Cumulative Impacts have also been significantly underestimated because the POLA failed to include the following in the Cumulative Impact Assessment:

a. Freight Transportation:

- Truck Points of Origin. Throughout Los Angeles and Orange Counties.
- On/Off Tidelands Property Truck Container/Flat Bed Inspection Facilities.
- On/Off Tidelands Property Container Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Container/Flat Bed Chassis Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Chassis 40' to 53' Modification, Cutting, Welding & Painting Facilities
- On/Off Tidelands Property TRU/Genset Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Truck Storage Yards, Staging, Maintenance & Repair Facilities.
- On/Off Tidelands Property Yard Tractor Storage Yards, Maintenance & Repair Facilities.
- On/Off Tidelands Property Container Fumigation Facilities.
- On/Off Tidelands Property Container Transloading Facilities.
- On/Off Tidelands Property Truck Fueling Facilities: Diesel, Natural CNG, LNG, Hydrogen.
- On/Off Tidelands Property Truck Yard Tractor Fueling Facilities: Diesel, Natural CNG, LNG, Hydrogen.
- On/Off Tidelands Property Truck Electrical Charging Stations.
- On/Off Tidelands Property Truck Yard Tractor Fueling Facilities.
- On/Off Tidelands Property Peel-Off Yards.
- New POLA projects such as the Everport Terminal Expansion Project.

CFASE has conducted a survey of Container Storage Yards in Wilmington and has identified 117 locations. See CFASE Attachments.

The Harbor Community Benefit Foundation also completed a Harbor Community Off-Port Land Use Study which also conformed the number of Container Storage Yards in Wilmington and other significant Off-Port Land Use impacts to Harbor Communities.

https://harborcommunitybenefitfound1.app.box.com/s/1f5nlt2mz6mia9w5bpeejyjy0nl wzut3

We request that the Final RSEIR review these documents and establish appropriate Mitigation Measures to reduce and eliminate Environmental and Public Health Impacts.

b. Port of Los Angeles & Port of Long Beach Projects:

Port of Los Angeles

1. Berth 164 Valero Marine Oil Terminal Wharf Improvements Project (MOTEMS)
2. Berth 167-168 Shell Marine Oil Terminal Wharf Improvements Project (MOTEMS)
3. Berths 187-190 Vopak Terminals Wharf Improvements Project (MOTEMS)
4. Berths 118-120 Kinder Morgan Wharf Improvements Project (MOTEMS)
5. Berths 148-151 Phillips 66 Wharf Improvements Project (MOTEMS)
6. Berth NuStar Energy LP Wharf Improvements Project (MOTEMS)
7. Berths 238-240C PBF Energy Wharf Improvements Project (MOTEMS)
8. POLA/Caltrans SR 47 Improvement Project
9. Berths 195-200A WWL Vehicle Services Americas
10. Harbor Boulevard Roadway Improvements Project
11. Removal of Underground Storage Tanks at Cabrillo Marina
12. Marine Research Center Project
13. Wilmington Marina Parkway
14. Berths 177-178 Transit She Demolition Project
15. SA Recycling Crane Replacement & Electrification Project
16. Avalon Freight Services Relocation Project
17. U.S. Navy Commission Building Demolition Project
18. Reeves Avenue Marine Services Support Yard
19. John S. Gibson Blvd. Port Development Truck Parking Center
20. Harbor Performance Enhancement Center
21. Draft Amendment To the Port of Los Angeles Master Plan-Maritime Support Services 2017

CFASE-19

Port of Long Beach

1. Pier F Berth F209-Chemical Marine Terminal (MOTEMS)
2. Pier B BerthsB82, B83-Petro-Diamond (MOTEMS)
3. Pier B Berths B76-B80, B84-B87-Tesoro Logistics -Operations LLS (MOTEMS)
4. Pier T Berth T121-Tesoro Logistics Operations LLS (MOTEMS)
5. Pier S Berth S101-Volpak Terminal Long Beach Inc (MOTEMS)
6. Southern California Edison Transmission Lines Replacement.
7. PCMC Chassis Support Facility Project.
8. Mitsubishi Cement Facility Project.
9. Baker Cold Storage Facility Project.
10. Eagle Rock Aggregate Terminal Project.
11. Sulex, Inc. Negative Declaration/Application Summary Report.
12. On-Dock Rail Support Facility Project

CFASE-19 ↑ 13. Fireboat Station 20

15. The SDEIR fails to include an assessment of Alternative Electric Rail Transportation Technologies

Zero Emission Electric Trains such as Maglev Technologies are faster, more efficient and can significantly increase throughput. American MagLev Technologies, Inc. has proposed to the Port of Los Angeles, Port of Long Beach, South Coast AQMD and the Southern California Association of Governments a feasible container transport Maglev Train System.

CFASE-20

EMMI Logistics Solutions and American MagLev Technology have designed a state-of-the-art goods movement transportation system that can transport up to 8,000 containers a day and more than 3 times the speed of traditional diesel locomotives. This technology also does not require 1-2 days to accumulate 250-300 train cars before it can travel to its destinations.

The Coalition For A Safe Environment has researched and published a comprehensive technology survey of Zero Emissions Technologies which includes Zero Emission Electric Train Technologies. See Attachment.

16. Air Quality & Meteorology Unavoidable Significant Impacts Determination

We disagree with your determination because there are numerous feasible technologies that can reduce air quality significant impacts that you are not including in the project or as proposed Mitigation Measures. These include Zero Emission Technologies, Near Zero Emission Technologies, Best Available Control Technologies (BACT), Best Available Retrofit Technologies (BART) and Emission Capture Technologies. All referenced technologies are commercially available today and can be ordered with delivery within one year depending on the quantity ordered.

CFASE-21

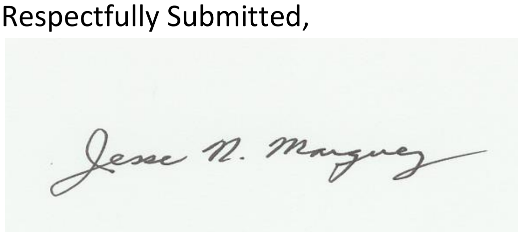
The Coalition For A Safe Environment has researched and published a comprehensive technology survey of all categories of Zero Emissions Technologies which can be used at the China Shipping Terminal, at the Port of Los Angeles and off-port. See Attachment.

17. Green House Gas Emissions Unavoidable Significant Impacts Determination

CFASE-22

We disagree with your determination because there are numerous feasible technologies that can reduce Greenhouse Gases significant impacts that you are not including in the project or as proposed Mitigation Measures. These include Zero Emission Technologies, Near Zero Emission Technologies, Best Available Control Technologies (BACT) and Emission Capture Technologies. All referenced technologies are commercially available today and can be ordered with delivery within one year depending on the quantity ordered.

Respectfully Submitted,



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Coalition For A Safe Environment

Zero Emission Transportation Vehicles, Cargo Handling Equipment & Construction Equipment Commercial Availability Survey

11.16.2018

Attachment "Commercial Status..." is Comment CFASE-23

Electric Trucks Class 8

1. BYD Motors - 8TT Battery-Electric Truck
2. BYD Motors - T9 Battery-Electric Truck
3. Kenworth - ZECT-Zero Emissions Cargo Transit T680 Hydrogen Fuel Cell
4. Nikola - Nikola One
5. Toyota - Electric Class 8 Truck - Hydrogen Fuel Cell
6. TransPower - ElecTruck
7. US Hybrid - Electric Class 8 Truck - eTruck
8. US Hybrid - Electric Class 8 Truck - H2Truck

Electric Yard Tractors Class 8

1. BYD Motors - 8TT Battery Electric Tractor *
2. BYD Motors - 8Y Tractor
3. BYD Motors - Q1M Battery Electric Tractor
4. Hoist Liftruck - TE Series Electric-Powered Terminal Tractor
5. Kalmar Ottawa - T2E Electric Terminal Tractor
6. Orange EV - T-Series 4x2 Terminal Truck
7. Orange EV - T-Series 4x2 Terminal Truck Conversion of Kalmar Ottawa Truck
8. Orange EV - T-Series Reman (Conversion/Repower)
9. Terberg - YT202EV
10. Transpower – Elec Truck Yard Tractor

Electric Trucks Class 6

1. BYD Motors - T7 Battery Electric Truck

Electric Trucks Class 5

1. BYD Motors - 5F/T5 Battery-Electric Box Truck
2. ADOMANI - Class 5 Truck Cab & Chassis

Electric Trucks Class 4

1. ADOMANI - Class 4 Truck

Electric Trucks Class 3

1. ADOMANI - Class 3 Truck

Electric Pickup Trucks

1. Havelaar Canada - Bison Electric Pickup Truck

2. Workhorse Group - W15 All Wheel Drive Electric Truck

Electric Ship-to-Shore (STS) Rail-Mounted Gantry Cranes

1. Konecranes Electric Ship-to-Shore (STS) Gantry Cranes
2. Liebherr Rail Mounted Electric Gantry Crane
3. Shanghai Zhenua Heavy Industries Co. Electric Ship-to-Shore Cranes

Electric Rubber-Tired Gantry (RTG) Cranes

1. ANUPAM-MHI - E-RTG Electric Rubber Tired Gantry Crane
2. Konecranes - Electric Cable Reel Rubber-Tired Gantry (RTG) Cranes
3. Konecranes - Electric Busbar Rubber-Tired Gantry (RTG) Cranes
4. Kalmar - E-One2 Zero Emission RTG
5. Liebherr Container Cranes - e-RTG
6. Terex Port Solutions - E-RTGs

Electric Rail-Mounted Gantry Cranes

1. HY Crane Co. Electric RMG Rail Mounted Container Gantry Crane

Reach Stackers

1. Transpower - Electric Forklift Reach Stacker
2. Konecranes Hybrid Reach Stacker

Shuttle Carrier

1. Kalmar Electric Shuttle Carrier

Straddle Carrier
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1. Konecranes Electric Straddle Carrier DE53
2. Konecranes Electric Straddle Carrier DE54
3. Konecranes Electric Boxrunner
4. Kalmar ESC440 Electric Straddle Carrier

Trailer Spreader

1. TEC Electric Trailer Spreader BA-030

Electric Forklifts

1. Bendi - Electric Narrow Aisle B-30
2. Bendi - Electric Narrow Aisle B-40
3. BYD Motors - ECB 16 Electric Forklift
4. BYD Motors - ECB 18 Electric Forklift
5. BYD Motors - ECB 20 Electric Forklift
6. BYD Motors - ECB 25 Electric Forklift
7. BYD Motors - ECB 27 Electric Forklift
8. BYD Motors - ECB 30 Electric Forklift
9. BYD Motors - ECB 35 Electric Forklift
10. CAT - EP16-20(C)N Electric Forklifts
11. CAT - EP10-15KRT PASC Electric Forklifts
12. CAT - EP10-16-20(C)PNT Electric Forklifts

13. Clark - GEX 40/45/50 Series Electric Forklifts
14. Clark - GEX ECX 20/25/30/32 Series Electric Forklifts
15. Clark - GEX 20/25/30 Series Electric Forklifts
16. Clark - GEX 16/18/20S Series Electric Forklifts
17. Clark - GTX 16/18/20S Series Electric Forklifts
18. Clark - TMX 12/15S/15/17/20/25 Series Electric Forklifts
19. Clark - ESX 12/15S/15/17/20/25 Series Electric Forklifts
20. Crown - RC 5500 Series Stand Up 3-Wheeled Electric Forklift
21. Crown - SC 5200 Series 3-Wheeled Electric Forklift
22. Crown - FC 4500 Series Four Wheeled Electric Forklift
23. Doosan - B40/45/50X-5 Series Electric 4-Wheel Forklift
24. Doosan - B22/25/30/35X-5 Series Electric 4-Wheel Forklift
25. Doosan - B20/25/25SE-7/30/32S-7 Series Electric 4-Wheel Cushion Forklift
26. Doosan - B15/18S/20SC-5 Series Electric 4-Wheel Cushion Forklift
27. Doosan - B15T/18TL/20T/20TL Electric 7 Series 3-Wheel Forklift
28. Doosan - B16/18/20X-7 Electric 7 Series 4-Wheel Forklift
29. Doosan - B13/15/16R-5 Series Rear Drive 3-Wheeled Forklift
30. Drexel - Electric Narrow Aisle SLT 30
31. Drexel - Electric Narrow Aisle SL-40
32. Hangcha - A Series 3 Wheeled Forklift
33. Hangcha - J Series 3 Wheeled Forklift
34. Hangcha - A Series 4 Wheeled Forklift
35. Hangcha - J Series 4 Wheeled Forklift
36. Hoist Liftruck - PE Series Heavy-Duty Pneumatic Lift Trucks
37. Hoist Liftruck - Lazer Series Cushion Tire Lift Truck
38. Hoist Liftruck - Neptune Electric Series Lift Truck
39. Hyster - E30-40XN Series Electric Lift 4 Wheel Truck
40. Hyster - J45-70XN Series Electric Pneumatic Tire
41. Hyster - J80-100XN Series Electric Pneumatic Tire
42. Hyster - Class 1 With Nuvera Hydrogen Fuel Cell
43. Hyster - Class 2 With Nuvera Hydrogen Fuel Cell
44. Hyster - Class 3 With Nuvera Hydrogen Fuel Cell
45. Hyundai Construction - Series 9 40B-9 Four Wheeled Forklift
46. Hyundai Construction - Series 9 45B-9 Four Wheeled Forklift
47. Hyundai Construction - Series 9 50B-9 Four Wheeled Forklift
48. Kalmar - EC50-90
49. Komatsu - FB10-FB18 Series Electric Forklifts
50. Komatsu - FB20 A Electric Forklift
51. Komatsu - FB15M-FB20M Series Electric Forklifts
52. Komatsu - FB25-FB30 Series Electric Forklifts
53. Komatsu - FB13RL-FB18RL Series Electric Forklifts
54. Konecranes - TX AC Electric Rider Lift Trucks
55. Konecranes - SRX AC Electric Reach Trucks
56. Mariotti - Electric AC
57. Raymond Corp. - 4150 Stand Up Forklift
58. Raymond Corp. - 4250 Stand Up Forklift
59. Raymond Corp. - 4460 Sit Down Forklift
60. Raymond Corp. - 4750 Stand Up Forklift
61. Raymond Corp. - 7200 Reach-Fork Truck
62. Raymond Corp. - 7300 Reach-Fork Truck
63. Raymond Corp. - 7500 Universal Stance Reach Truck
64. Raymond Corp. - 7500 Dockstance reach Forklift

65. Raymond Corp. - 7000 Series Deep-Reach Forklift Truck
66. Raymond Corp. - 7700 Reach-Fork Truck
67. Raymond Corp. - 7310 4-Directional Reach Truck
68. Raymond Corp. - 9600 Sw8ing Reach Turret Truck
69. Raymond Corp. - 9700 Sing Reach Truck
70. Raymond Corp. - 9800 Swing Reach Truck
71. Raymond Corp. - TRT Transtacker Truck
72. Raymond Corp. - 9300 Sideloader Long Load Forklift
73. Raymond Corp. - 9400 Sideloader Forklift
74. Still - RX 50 1.0-1.6T Three-Wheeled Electric Forklift
75. Still - RX 20 1.4-2.0T Three-Wheeled Electric Forklift
76. Still - RX 20 1.4-2.0T Li-Ion Three-Wheeled Electric Forklift
77. Still - RX 60 1.6-2.0T Four Wheeled Electric Forklift
78. Still - RX 60 2.5-3.5T Four Wheeled Electric Forklift
79. Still - RX 60 3.5-5.0T Four Wheeled Electric Forklift
80. Still - RX 60 6.0-8.0T Four Wheeled Electric Forklift
81. Mitsubishi Forklift Trucks - FB16PNT-FB20PNT Series Three-Wheeled Electric
82. Mitsubishi Forklift Trucks - FBC15N-FBC18N Series Small Electric Cushion
83. Mitsubishi Forklift Trucks - FBC22N2-FBC30LN3 Series Mid-Size Electric Cushion
84. Mitsubishi Forklift Trucks - FBC15NS-FBC20NS Series Stand-Up End Control
85. Toyota - Core Electric Forklift
86. Toyota - Large Electric Forklift
87. Toyota - 3-Wheel Electric Forklift
88. Toyota - Stand-Up Rider Forklift
89. Toyota - Electric Pneumatic Forklift
90. Toyota - High-Capacity Electric Cushion Forklift
91. Yale - ESC 30 Three-Wheeled Forklift
92. Yale - ERC Four Wheeled Forklift
93. Yale - ERP30 Four Wheeled Forklift

Electric Pallet Truck

1. BYD - P20JW All-Electric Walkie Pallet Truck

Electric Dredger

1. Custom Dredge Works, Inc.
2. DSC Dredge
3. IMS Dredges
4. Ellicott Dredges. LLC
5. TV Dredging

Electric Tow Tractor

1. Clark - CTX 40/70 Series Electric Tow Tractor
2. Konecranes - TGX AC Electric Tow Tractor
3. Raymond - 8610 Tow Tractor

Tracked Dozer (Tractor)

1. Catepillar - D7E Hybrid Bulldozer

Excavators

1. Bobcat - E10 Electric Micro-Excavator
2. Kato - 9VXE- 3 Electric Mini Excavator
3. Kato - 17VXE Electric Mini Excavator

Top Front End Payloader

1. BYD Motors - Zero Emission Top Front Payloader

Skid Steer

1. Giant - E-Skid Steer Remote Control Skid-Steer Loader
2. Kovaco - eLise 900 Electric Skid Ster Loader
3. Schibeci - 32PE Electric Mini Skid Steer Loader
4. Sherpa - 100 ECO Electric Mini Skid-Steer

Wheeled Loader

1. Catepillar - 988K XE Electric Drive Wheel Loader
2. Hitachi - ZW220HYB-5 Hybrid Wheel Loader
3. John Deer - 944K Hybrid Wheel Loader
4. Kramer - KL25.5e Electric Wheeled Loader
5. Kramer - 5055e Electric Wheel Loader

Rope Shovels

1. Catepillar - Model 7295 Electric Rope Shovels
2. Catepillar - Model 7395 Electric Rope Shovels
3. Catepillar - Model 7495 HD Electric Rope Shovels

Dump Trucks

1. California Truck Equipment Co. - All-Eectric Powertrain With Ford E450 Dump Truck
2. California Truck Equipment Co. - All-Eectric Powertrain With Ford F59 Dump Truck

Delivery Truck

1. AMP - E-100 V.2 All-Electric Step Van With Workhorse Chassis
2. BYD Motors - T7 Battery Electric Delivery Truck - Class 7
3. BYD Motors - T5 Battery Electric Delivery Truck - Class 5
4. Mitsubishi Fuso Truck & Bus Corp. - Fuso eCanter Light Class 4 Delivery Truck
5. Mitsubishi Fuso Truck & Bus Corp./E-Fuso Vision One Heavy Duty Class 5 Delivery Truck
6. Motive Power Systems - All-Electric Powertrain For Ford E450 Box Truck/Flat Bed
7. Motive Power Systems - All-Electric Powertrain For Ford F59 Walk In Van
8. UPS - Hydrogen Fuel Cell Class 6 Delivery Truck

Cab Chassis Delivery Truck

1. ADOMANI - Class 3 All-Electric Cutaway
2. ADOMANI - Class 5 Truck Cab & Chassis
3. Motiv Power Systems - EPIC 4 Series
4. Motiv Power Systems - EPIC 5 Series
5. Motiv Power Systems - EPIC 6 Series
6. Zenith - Electric Chassis Cab
7. Zenith - Electric Cutaway Cab

Flat Bed Truck

1. Motive Power Systems - All-Electric Powertrain For Ford E450 Box Truck/Flat Bed
2. Phoenix Motorcars - ZEUS Electric Flatbed Ford E350
3. Phoenix Motorcars - ZEUS Electric Flatbed Ford E450

Cargo Panel Van

1. ADOMANI - All-Electric Logistic Van
2. Chanje Energy Inc. - Class 5 - V8070 Electric Panel Van
3. Chanje Energy Inc. - V8100 Electric Panel Van
4. Morgan Olson Route Star - Motiv All-Electric Powertrain Ford F59 Walk-In-Van
5. Rockport Commercial Vehicles Cargoport - Motiv All-Electric Powertrain
6. Zenith Motors - Electric Step/Walk-In Van

Cargo Van

1. Green4U Technologies - Cargo Van
2. Lighting Systems - Electric Transit Cargo Van
3. Mercedes-Benz - eSprinter
4. VIA - Cargo Van
5. Volkswagon - I.D. Buzz Cargo Van
6. Workhorse - N-Gen Electric Cargo Van
7. Zenith Motors - Electric Cargo Van

Utility/Electric Trucks

1. California Truck Equipment Co. - Motiv All-Eectric Powertrain With Ford E450 Utility Truck
2. California Truck Equipment Co. - Motiv All-Eectric Powertrain With Ford F59 Utility Truck
3. Phoenix Motorcars - ZEUS Electric Utility Service Vehicle Ford E350/E450 *

Aerial Boom Truck

1. Altec - Aerial Boom Vehicle with JEMS: 16-20 kWh Lithium-Ion Battery *
2. Hyster - Ascender AWP
3. JLG - Aerial Lift
4. Yale - AEREO AWP

Electric Refuse Trucks

1. BYD/Wayne Engineering - Class 8 Electric Refuse Truck
2. Motiv Power - ERV Battery-Electric Class 8 Refuse Truck
3. Petebuilt - Model 520 Battery-Electric Class 8 Refuse Truck
4. Wrightspeed - Electric Powertrain Refuse Truck

Street Sweeper

1. Tropos - ABLE Sweep eCUV

Fire Trucks

1. Suzhou Eagle Electric Vehicle Manufacturing Co.
2. Citecareelectricvehilces.com - CitEcar Fire Buddy Deluxe

Compact Utility Vehicles

1. Alke - Electric Cargo Van
2. Columbia ParCar Corp. - Payloader/Welding
3. Columbia ParCar Corp. - Payloader/Van Body
4. Columbia ParCar Corp. - Payloader/Metal Cage
5. Columbia ParCar Corp. - Payloader/Folding Side Rails
6. Columbia ParCar Corp. - Payloader/Steel Cab
7. Columbia ParCar Corp. - Payloader/Refuse Unit
8. Columbia ParCar Corp. - Utility MVP
9. Columbia ParCar Corp. - Utilitruck
10. GEM - GEM e2
11. GEM - GEM e4
12. GEM - GEM e6
13. GEM - GEM eL XD
14. GEM - GEM eM 1400 LSV
15. Tropos Motors - ABLE FRV - Electric Fire Response Vehicle
16. Tropos Motors - ABLE EMSo - Electric Medical Service Vehicle, Open Platform
17. Tropos Motors - ABLE EMSc - Electric Medical Service Vehicle, Closed Platform
18. Tropos Motors - ABLE Trades
19. Tropos Motors - ABLE Pickup
20. Tropos Motors - ABLE Cargo

Passenger Trains

1. ALWEG Rapid Transit Company – Monorail Passenger Train
2. Altrom - Prima M4 - AZ4A Passenger Locomotives
3. Altrom - Citadis Dualis Tram-Train
4. Altrom – Ciutadis Spirit Light rail Vehicle
5. Altrom - Metropolis Metro
6. Altrom - Translohr Tramway On Tyres
7. Altrom - X'Trapolis Suburban Train
8. Bombardier Transportation
9. Bombardier - Innovia APM 100
10. Bombardier - Innovia APM 200 Automated People Mover System
11. Bombardier - Innovia APM 256
12. Bombadier - Innovia APM 300 Automated People Mover System
13. Bombardier - Innovia Monorail
14. Bombardier - Flexibility Trams
15. Bombardier - Flexibility 2 Trams
16. Bombardier - Flexibility Freedom
17. Bombardier - Flexibility Light Rail Vehicles
18. Bombardier - Single Deck Electric Multiple Units
19. Bombardier - Double-Deck Electric Multiple Units
20. BYD - Skyrail Monorail System
21. CAF - Electric Locomotive BB A 3000V
22. CAF - Electric Locomotive BBB A 3000V
23. CAF - Electric Locomotive C'C' 3.000V
24. CRRC Zhuzhou Locomotive Co. LTD - HX1D AC Rapid Electric Passenger Locomotive
25. CRRC Zhuzhou Locomotive Co. LTD - ERP Passenger
26. CRRC Zhuzhou Locomotive Co. LTD - Maglev Passenger Train
27. Hitachi - AT 100 Metro Dual Voltage
28. Hitachi - AT 200 Commuter Dual Voltage
29. Hitachi - AT 300 Intercity High Speed

30. Hitachi - Monorail Passenger Train
31. Hyundai Rotem - Manned Electric Passenger Trains
32. Hyundai Rotem - Unmanned Electric Passenger Trains
33. Inekon - Trio Low Floor Tram
34. Inekon - 04 Superior Low Floor Tram
35. Inekon - 11 Pento Low Floor Tram
36. JSC Kolomensky Zavoc - EP2K Passenger Electric Locomotive
37. Kawasaki - SWIMO Ultra Low Floor Tramway
38. Kawasaki - JR East 200 Electric Passenger Extreme Cold Weather Train
39. Kawasaki - 05 Series Electric Subway Train
40. Kawasaki - 22 Series Electric Subway Train
41. Kawasaki - 66 Series Electric Subway Train
42. Kawasaki - 70-000 High Speed Electric Rail Train
43. Kawasaki - 2000 Series High Speed Electric Rail Train
44. Kawasaki - 1000 Series Electric Subway Train
45. Kawasaki - 3000 Series Electric Subway Train
46. Kawasaki - 5000 Series Electric Subway Train
47. Kawasaki - 6300 Series Electric Subway Train
48. Kawasaki - 8000 Series Electric Subway Train
49. Kawasaki - 16000 Series Electric Subway Train
50. Kawasaki - R143 Series Electric Subway Train
51. Kawasaki - PA-5 Commuter Electric Train
52. Kawasaki - 30000 Series Electric Railway Train
53. Kawasaki - 1000 Series Monorail Vehicle
54. Kawasaki - efSET Electric High Speed Railway Vehicle
55. Nippon Sharyo - Light Rail Electric Vehicles (LACMTA)
56. Nippon Sharyo - Model 800 Low Floor Light Rail Electric Vehicles
57. Nippon Sharyo - Gallery Type Bi-Level EMU
58. Nippon Sharyo - Highliner Gallery Type Bi-Level EMU
59. Nippon Sharyo - Commuter EMU
60. Nippon Sharyo - AE100 Express EMU
61. Nippon Sharyo - Series 215 EMU
62. Nippon Sharyo - Series 371 Express EMU
63. Nippon Sharyo - Series 683 Express EMU
64. Nippon Sharyo - Series 1700 Express EMU
65. Nippon Sharyo - Series 2000 Electric EMU
66. Nippon Sharyo - Series 2200 Electric EMU
67. Nippon Sharyo - Series 50000 Express EMU
68. Nippon Sharyo - Series 60000 Express EMU
69. Nippon Sharyo - Series 7000 Driverless Tram With Rubber tires
70. Nippon Sharyo - Model HSST-100 Linimo Maglev Train Fully Auitomated
71. Nippon Sharyo - Model 40 Suspended Monorail
72. Nippon Sharyo - Light Rail Vehicle
73. Patentes Taolgo SI - Electric Locomotive
74. Scoda Electric - Emil Zatopek Electric Passenger Locomotive
75. Scoda Electric - Single Deck Electric Unit Passenger Train
76. Scoda Electric - Double Single Deck Electric Unit Passenger Train
77. Scoda Electric - Monorail Passenger Train
78. Siemens - Avenio Single Articulated Tram Low Floor
79. Siemens - Avenio Single Articulated Tram Low Floor
80. Siemens - Streetcar S70 Light Rail Passenger Train
81. Swiss Stadler Rail Group FLIRT High Speed Low Floor Multi Unit Passenger Rail

82. Swiss Stadler Rail Group FLIRT 160 High Speed Low Floor Single Decker Passenger Train
83. Swiss Stadler Rail Group - KISS200 long Distance Double Decker Passenger Train
84. Swiss Stadler Rail Group - TANGO City Train High or Low Floor
85. Swiss Stadler Rail Group - TRAMLINK Multi Link Low Floor Train
86. Titagarh - TSR Lenord Double Deck EMU
87. Titagarh - TAF Double Deck EMU
88. Titagarh - ETR500 High Speed Trainset
89. Titagarh - E403 Electric Loco
90. Titagarh - E404.600 High Speed Electric Loco
91. Titagarh - EMUCVS Articulated Single Deck EMU Metrostar
92. Toshiba - 15E Electric Locomotives
93. Toshiba - 19E Electric Locomotives Dual-Voltage
94. Toshiba - SciB Battery Light Rail Transit
95. Toshiba - HSR High Speed Rail
96. Tulomsas - E68000 Electric Outline Engine Passenger Train
97. WINDHOFF Bahn- und Anlagentechnik GmbH

Note: All electric trains in the Netherlands are now 100% Wind Powered

Freight Train

1. Alstrom – 800 Prima T8 (WAG12)
2. CRRC Zhuzhou Locomotive Co. LTD - HX1F Electric Locomotive
3. CRRC Zhuzhou Locomotive Co. LTD - HX 1B Electric Locomotive
4. CRRC Zhuzhou Locomotive Co. LTD - HX 1C Electric Locomotive
5. CRRC Zhuzhou Locomotive Co. LTD - HX 1 Electric Locomotive
6. CRRC Zhuzhou Locomotive Co. LTD - SS Electric Locomotive
7. CRRC Zhuzhou Locomotive Co. LTD - 22E Dual-Voltage
8. CRRC Zhuzhou Locomotive Co. LTD - 21E Dual-Voltage Narrow
9. CRRC Zhuzhou Locomotive Co. LTD - 20E Dual-Voltage Narrow
10. CRRC Zhuzhou Locomotive Co. LTD - KZ4AC
11. CRRC Zhuzhou Locomotive Co. LTD - O’Z-Y
12. Kawasaki - JR Cargo EF 210 Electric Locomotive
13. Kawasaki - JR Cargo EF 510 Electric Locomotive
14. Kawasaki - JR Freight M 250 Super Rail Cargo Electric Locomotive
15. Kawasaki - 6K Freight Electric Locomotive
16. Schoma Lokomotiven - Electric Tunnel Locomotives
17. Siemens - eHighway Freight System
18. Swiss Stadler Rail Group - NG Shunting Locomotive
19. Swiss Stadler Rail Group - Tailor Made Locomotives
20. Tulomsas - E43000 Electric Locomotive
21. Tulomsas - E1000 Electric Maneuvering Engine
22. Tulomsas - E68000 Electric Outline Engine Freight Train

Passenger Van

1. Green4U Technologies - Passenger Cargo Van
2. Lightning Systems - Ford Transit EV 350HD Passenger Wagon
3. Mercedes-Benz - eVito Passenger Van
4. VIA - Passenger Van
5. Zenith Motors - Electric Passenger Van

Passenger/Shuttle Buses

1. Altrom – Aptis Electric Bus
2. Ameritrans Bus - All-Electric Motiv ePCS On Ford E450 Chassis 25 Passenger Shuttle Bus
3. Advanced Vehicle Manufacturing (AVM) - All Electric Mid-Size Shuttle Bus EV21
4. Advanced Vehicle Manufacturing (AVM) - All Electric Mid-Size Shuttle Bus EV27
5. Advanced Vehicle Manufacturing (AVM) - All Electric Mid-Size Shuttle Bus EV33
6. BYD Motors - C6 23-Ft Zero-Emission Electric Motor Coach
7. BYD Motors - K7M 30-Ft All Electric Zero-Emission Transit Bus
8. BYD Motors - K9s 35-Ft Zero-Emission Transit Bus
9. BYD Motors - K9M 40-Ft All Electric Zero-Emission Transit Bus
10. BYD Motors - K9S 40-Ft All Electric Zero-Emission Transit Bus
11. BYD Motors - C9 40-Foot Zero-Emission Electric Motor Coach
12. BYD Motors - C10M 45-Ft Articulated All Electric Coach
13. BYD Motors - K11M 60-Ft Articulated All Electric Zero-Emission Transit Bus
14. Green4U Technologies - Shuttle Bus
15. Green4U Technologies - Touring Bus
16. GreenPower - EV350 40-Foot All Electric
17. GreenPower - EV550 40-Foot All Electric Double Decker Bus
18. GreenPower - SYNAPSE 72 All Electric Shuttle Bus
19. International IC Bus - IC charge All-Electric Bus
20. Mercedes-Benz - eCitaro
21. Motiv Power Systems - EPIC 4 Passenger Bus
22. Motiv Power Systems - EPIC 6 Passenger Bus
23. New Flyer - Xcelior XE 35 Bus With Lithion-Ion Battery Pack
24. New Flyer - Xcelior XE 40 Bus With Lithion-Ion Battery Pack
25. Phoenix Motorcars - ZEUS-Zero Emissions Utility Shuttles
26. Proterra - Catalyst FC 35-Foot Urban Transit Bus
27. Proterra - Catalyst XR 35-Foot Urban Transit Bus
28. Proterra - Catalyst E2 35-Foot Urban Transit Bus
29. Proterra - Catalyst FC 40-Foot Urban Transit Bus
30. Proterra - Catalyst XR 40-Foot Urban Transit Bus
31. Proterra - Catalyst E2 40-Foot Urban Transit Bus
32. Solaris - Urbino 8 LE Electric Bus
33. Solaris - Urbino 9 LE Electric Bus
34. Solaris - Urbino 12 LE Electric Bus
35. Solaris - Urbino 18 LE Electric Bus
36. Toshiba - Sora FC EV Bus
37. VDL Bus & Coach - Citea SLF-120 Electric Bus
38. VDL Bus & Coach - Citea SLF-121 Electric Bus
39. VDL Bus & Coach - Citea SLFA-180 Electric Bus
40. VDL Bus & Coach - Citea SLFA-181 Electric Bus
41. VDL Bus & Coach - Citea SLFA-187 Electric Bus
42. VDL Bus & Coach - Citea LLE - 99 Electric Bus
43. Zenith Motors - Electric Mini Bus

Compact Shuttle

1. Columbia - 6 Passenger Shuttle
2. Columbia - MVP 14 Passenger Shuttle

School Buses

1. ADOMANI - Electric School Bus
2. Blue Bird - Type D RE Electric School Bus
3. Blue Bird - Type A Micro Bird G5 Electric School Bus
4. Creative Bus Sales Inc. - Type C Motiv All-Eectric Powertrain With Ford F59 Starcraft School Bus
5. GreenPower - SYNAPSE 72 All Electric School Bus

6. LION Electric - eLion Type C School Bus
7. Motiv Power Systems - eQuest XL All-Eectric Powertrain With Ford F59 Starcraft School Bus
8. Motiv Power Systems - EPIC 4 Type A School Bus
9. Motiv Power Systems - EPIC 5
10. Motiv Power Systems - EPIC 6 Type C School Bus
11. Thomas Built Buses – Saf-T-Liner C2 Jouley Electric School Bus
12. Transpower - Type C Transit School Bus
13. Trans Tech Bus - SSTe - Motiv ePCS On Ford E450 Chassis School Bus

Taxi

1. BYD - E6 Electric Taxi
2. Electric Cab North America - Micro Transit Shuttles
3. Nissan LEAF Electric Taxi

Underground Mining Equipment

1. Epiroc - Scooptram ST7 Battery Electric Loader
2. Epiroc - Scooptram EST1030 Electric Loader
3. Epiroc - Scooptram EST2D Electric Loader
4. Epiroc - Scooptram EST3.5 Electric Loader
5. Epiroc - Minetruck MT2010
6. Epiroc - Minetruck MT42
7. Epiroc - Boomer E2 Battery Face Drill Rig

Note:
1. CFASE conducts periodic searches for all vehicles and equipment that are zero emissions. Our survey is the most comprehensive document of zero emission technologies.
2. CFASE contacted the manufacturer directly to obtain information or information was available on the manufacturer website.
3. Commercially Available means that the manufacturer is accepting orders for delivery to customer in less than one year. Time of delivery can vary due to the type and number of vehicles ordered.
4. Vehicles and Equipment can be new or used and be retrofitted to be zero emission.
5. California CEQA law does not require a technology being considered as a project element or mitigation measure to be certified, verified or validated by any governmental agency. However, the agency and/or project sponsor must do its due diligence to confirm that the technology works for the proposed project application or a part of the project application. i.e Trucks can service short distance hauls but not long distance hauls.
6. California CEQA law allows technologies under R&D, pilot testing and demonstration testing to be considered as proposed a mitigation measure and does not require a technology to be commercially available at the time of the EIR, but does require the technology to be commercially available and meet all application performance requirements by the project completion date.

Coalition For A Safe Environment (CFASE)

Wilmington Container Storage Yards Survey

Attachment "Wilmington Container..." is Comment CFASE-24

10.31.2016

117 Container Storage Yard (CSY) Locations

Notes:

1. CFASE Container Storage Yard definition: Has 5 or more containers stored at location temporarily, long term or permanent).
2. Containers may be stacked as high as 5 high on top of each other.
3. Containers are traditionally stacked on the ground. (? Long Term or Permanently Stored)
4. Containers may be stored on a chassis. (? Temporary Storage)
5. Some Container Storage Yards now store Trucks, Chassis and TRU's. (TRU-Transport Refrigeration Unit)
6. Some Container Storage Yards now repair and maintain Trucks, Chassis and TRU's.
7. Some CSY's have no visible address, so we put the nearest street sign address. Addresses which are 400, 600 etc. may be the corner street sign address.
8. CFASE did not check CSY with the City of Los Angeles to verify type of business license, permit or waiver.

EJ Community Issues:

1. Unlicensed Business, Unpermitted Business and no approved Certificate of Occupancy.
2. Many public street routes to CSY's are not zoned for heavy duty trucks.
3. Trucks enter No Over 6,000 lb. truck streets even with posted signs.
4. New CSY's not complying with new City of Los Angeles CSY zoning and Q conditions.
5. Contaminated storage lot land PM dust ambient air pollution source from truck movement and wind. (Hydrocarbons)
6. PM dust from dirt lots are a major air pollution source which blow into adjacent residential neighborhoods.
7. Contaminated storage lot land dirt on truck tires and PM falls onto public streets, curbs and gutters.
8. TRU's on reefer containers are not evacuated & HFC's greenhouse gases escape into ambient air.
9. Illegal and improper hazardous materials storage, transport and disposal. No Risk Management Plan.
10. CSY's become Insect Vector Haven.
11. CSY's become Rat Vector Haven. Rats cross street becoming major resident complaint issue.
12. CSY's become Raccoon & Possum Vector Havens.
13. Some CSY's wash containers, trucks and chassis and the water run-off goes into public streets, curbs and gutters. If there are curbs and gutters.
14. Many CSY's are often stored on dirt lots and when it rains them fall over and slide down hill banks.
15. The majority of containers are made in Asia & suspected of using lead paint which deteriorates into flakes and powder which is toxic PM dust that drifts into the ambient air & adjacent residential neighborhoods.
16. Trucks often park in neighborhood streets waiting to enter CSY's.
17. Trucks often double park in streets waiting to enter CSY's.
18. Truck drivers use empty containers illegally to help move household furniture for friends & family.

Container Storage Yards:

1.		921 E. Opp Street	Wilmington, CA 90744	
2.	American Integrated	1502 E. Opp Street	Wilmington, CA 90744	
3.	Gold Point/ConGlobal Industries	1621 E. Opp Street	Wilmington, CA 90744	
4.	Excell Truck Services, Inc	505 N. Flint Ave.	Wilmington, CA 90744	310-404-7330
5.	FX Express	531 N. Flint Ave.	Wilmington, CA 90744	310-835-4504
6.	FX Express	525 Flint Ave.	Wilmington, CA 90744	
7.		522 N. Flint Ave	Wilmington, CA 90744	
8.		531 N. Flint Ave.	Wilmington, CA 90744	
9.	Certifresh	572 N. Flint Ave.	Wilmington, CA 90744	
10.		605 N. Flint Ave.	Wilmington, CA 90744	
11.		825 N. Flint Ave.	Wilmington, CA 90744	
12.		600 N. Preble Ave.	Wilmington, CA 90744	
13.		918 N. Preble Ave.	Wilmington, CA 90744	
14.		401 E. F Street	Wilmington, CA 90744	
15.		901 E. F Street	Wilmington, CA 90744	
16.		933 E. F Street	Wilmington, CA 90744	
17.		936 E. F Street	Wilmington, CA 90744	
18.		413 N. Eubank Ave.	Wilmington, CA 90744	
19.		514 N. Eubank Ave.	Wilmington, CA 90744	
20.		534 N. Eubank Ave.	Wilmington, CA 90744	
21.	Schafter Logistics	600 N. Eubank Ave.	Wilmington, CA 90744	
22.		900 N. Eubank Ave.	Wilmington, CA 90744	
23.		910 N. Eubank Ave.	Wilmington, CA 90744	
24.		930 N. Eubank Ave.	Wilmington, CA 90744	
25.		940 N. Eubank Ave.	Wilmington, CA 90744	
26.	ICE-International Cargo Equipment	1540 N. Eubank Ave.	Wilmington, CA 90744	
27.	IRE-International Refrigeration Services	1542 N. Eubank Ave.	Wilmington, CA 90744	
28.	DPE Container Sales & Modifications	1550 N. Eubank Ave.	Wilmington, CA 90744	
29.		444 N. Quay Ave.	Wilmington, CA 90744	
30.	PacAnchor Transportation, Inc.	425 N. Quay Ave.	Wilmington, CA 90744	562-435-6464
29.	Harbor Express	501 N. Quay Ave.	Wilmington, CA 90744	
30.		518 N. Quay Ave.	Wilmington, CA 90744	
31.		520 N. Quay Ave.	Wilmington, CA 90744	
32.	CPNJ Trucking Inc.	544 N. Quay Ave.	Wilmington, CA 90744	310-325-9100
33.		550 N. Quay Ave.	Wilmington, CA 90744	
34.		710 N. Quay Ave.	Wilmington, CA 90744	
35.		730 N. Quay Ave.	Wilmington, CA 90744	
36.		734 N. Quay Ave.	Wilmington, CA 90744	
37.	KNR Logistics	800 N. Quay Ave.	Wilmington, CA 90744	
38.		413 E Street	Wilmington, CA 90744	
39.		419 E Street	Wilmington, CA 90744	
40.		427 E Street	Wilmington, CA 90744	
41.		429 E Street	Wilmington, CA 90744	
42.		525 E Street	Wilmington, CA 90744	
43.	J & P Clutch	626 E Street	Wilmington, CA 90744	
44.		701 E Street	Wilmington, CA 90744	
45.		922 E Street	Wilmington, CA 90744	
46.	PacAnchor Transportation, Inc.	211 E. D Street	Wilmington, CA 90744	562-435-6464
47.	Swift Transportation	221 E. D Street	Wilmington, CA 90744	
48.	Tricon Transportation, Inc.	650 E. D Street	Wilmington, CA 90744	310-518-8900
49.		721 E. D Street	Wilmington, CA 90744	
50.		325 W. C Street	Wilmington, CA 90744	

51. Pacific Container Carriers	335 W. C Street	Wilmington, CA 90744	310-518-8641
52.	400 W. C Street	Wilmington, CA 90744	
53.	425 W. C Street	Wilmington, CA 90744	
54. UTI	429 W. C Street	Wilmington, CA 90744	
55.	509 W. C Street	Wilmington, CA 90744	
56.	512 W. C Street	Wilmington, CA 90744	
57.	519 W. C Street	Wilmington, CA 90744	
58.	232 E. G Street	Wilmington, CA 90744	
59.	412 E. G Street	Wilmington, CA 90744	
60.	417 E. G Street	Wilmington, CA 90744	
61.	420 E. G Street	Wilmington, CA 90744	
62. Southbay Logistic Intl.	505 E. G Street	Wilmington, CA 90744	
63. HBR	910 E. G Street	Wilmington, CA 90744	
64.	1027 E. G Street	Wilmington, CA 90744	
65. WJE Trucking	1117 E. G Street	Wilmington, CA 90744	
66. Athens Transportation	321 Lakme Ave.	Wilmington, CA 90744	
67.	536 McFarland Ave.	Wilmington, CA 90744	
68. ASK Marine, Inc.	1020 McFarland Ave.	Wilmington, CA 90744	
69.	1025 McFarland Ave.	Wilmington, CA 90744	
70.	825 Mahar Ave.	Wilmington, CA 90744	
71. TS Golden State Trucking Inc.	936 Mahar Ave.	Wilmington, CA 90744	
72. ACX-USDA Certified Export Hay	920 Pacific Coast Hwy.	Wilmington, CA 90744	
73. IBT-Intermodal Bridge Transport, Inc.	1919 E. Pacific Coast Hwy.	Wilmington, CA 90744	
74. Pacific Coast Container, Inc.	1919 E. Pacific Coast Hwy.	Wilmington, CA 90744	
75. Pacific Coast Container Inc.	1921 E. Pacific Coast Hwy.	Wilmington, CA 90744	
76. Fast Lane Intermodal, LLC	2400 E. Pacific Coast Hwy.	Wilmington, CA 90744	
77. Container Express Transport, Inc.	306 N. Avalon Blvd.	Wilmington, CA 90744	
78. Pacific Trucks, LLC.	527 N. Avalon Blvd.	Wilmington, CA 90744	
79. Container Intermodal Transport	816 N. Henry Ford Ave.	Wilmington, CA 90744	
80. Pioneer Ocean Containers, Inc.	316 Banning Blvd.	Wilmington, CA 90744	
81. Milestone Trucking	520 Banning Blvd.	Wilmington, CA 90744	
82.	522 Banning Blvd.	Wilmington, CA 90744	
83.	532 Banning Blvd.	Wilmington, CA 90744	
84.	536 Banning Blvd.	Wilmington, CA 90744	
85. McLine Carrier Corp.	535 Banning Blvd.	Wilmington, CA 90744	
86. Container Care International, Inc.	1711 Alameda Street	Wilmington, CA 90744	
87. ConGlobal Industries	1711 Alameda Street	Wilmington, CA 90744	310-427-3125
88.	921 Goodrich Ave.	Wilmington, CA 90744	
89. Long Beach Container Transport	1040 Goodrich Ave	Wilmington, CA 90744	
91. Certified Container Services, LLC	1301 E. Lomita Blvd.	Wilmington, CA 90744	
92. Ventura Transfer Company	1302 E. Lomita Blvd.	Wilmington, CA 90744	
93. RES Refrigerated Container California	1304 E Lomita Blvd.	Wilmington, CA 90744	
94.	1320 E. Lomita Blvd.	Wilmington, CA 90744	
95. Martin Container, Inc.	1402 E. Lomita Blvd.	Wilmington, CA 90744	310-830-0500
96. Absolute Intermodal, LLC	1500 E. Lomita Blvd.	Wilmington, CA 90744	
97. Harbor Division, Inc.	1500 E. Lomita Blvd.	Wilmington, CA 90744	
98. CMI-California Multimodal LLC	1501 E. Lomita Blvd.	Wilmington, CA 90744	
99. Con Global Industrial Container Sales	1507 E. Lomita Blvd.	Wilmington, CA 90744	
100.	330 Lecouveur Ave.	Wilmington, CA 90744	
101.	420 Lecouveur Ave.	Wilmington, CA 90744	
102.	422 Lecouveur Ave.	Wilmington, CA 90744	
103.	521 Lecouveur Ave.	Wilmington, CA 90744	
104.	523 Lecouveur Ave.	Wilmington, CA 90744	
105.	602 Lecouveur Ave.	Wilmington, CA 90744	

106.	WJE Trucking	800 E. Colon Street	Wilmington, CA 90744	
107.	Anderson Hay Company	900 E. Colon Street	Wilmington, CA 90744	
108.		1000 E. Sandison St.	Wilmington, CA 90744	
109.		1811 Mauretania St.	Wilmington, CA 90744	
110.	Anviari	1733 Robidoux St.	Wilmington, CA 90744	
111.		1815 Robidoux St.	Wilmington, CA 90744	
112.		1857 Robidoux St.	Wilmington, CA 90744	
113.		506 Sanford Ave.	Wilmington, CA 90744	
114.		544 Sanford Ave.	Wilmington, CA 90744	
115.		642 Sanford Ave.	Wilmington, CA 90744	
116.		716 Sanford Ave.	Wilmington, CA 90744	
117.	Tradelink Transport Inc.	1331 E. Anaheim St.	Wilmington, CA 90744	310-513-0900

Response to Comment CFASE-1

This is not a comment on the adequacy of the Recirculated DSEIR. As explained in Section 1.2.3.2 of the RDSEIR, the ASJ allowed for China Shipping to continue operating the terminal under the existing lease (Permit No. 999) signed in 2001. While the lease was supposed to have been amended after certification of the 2008 EIR, "[t]he preparation of an EIR is not generally the appropriate forum for determining the nature and consequences of prior conduct of a project applicant . . .." (Eureka Citizens for Responsible Gov't v. City of Eureka (2007) 147 Cal.App.4th 357, 371.) As required under CEQA, the Recirculated DSEIR will be used by LAHD, as the lead agency under CEQA, in making a decision regarding the future operation of the Revised Project. If it is determined that changes to existing mitigation measures are recommended as a result of the Recirculated DSEIR, the Board of Harbor Commissioners will consider amending the lease for operations at Berths 97-109 to include those measures. The Recirculated DSEIR does not determine how those measures will be implemented or enforced. Any action by LAHD to enforce mitigation measures (past or future), or other lease provisions, would be a separate proceeding outside the scope of this EIR process. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment CFASE-2

LAHD disagrees with the claim that the zero-emission trucks cited by the commenter are suitable for deployment in port drayage service and that "long-haul trucks will be available in 2019." Please see Master Response 2: Zero-and Near-Zero-Emission Technologies, which reviews the makes and models cited by the comment; the report "Assessment of the Feasibility of Requiring Alternative-Technology Drayage Trucks at Individual Container Terminals," referenced as LAHD (2017) in the Recirculated DSEIR and hereinafter "Drayage Truck Study;" and the report "2018 Feasibility Assessment For Drayage Trucks" (Tetra Tech/GNA, 2019a). Those analyses demonstrate that while zero-emission heavy-duty (i.e., Class 7 and 8) trucks are commercially available (although the numbers that could be supplied are uncertain), those trucks are not yet proven in port drayage applications, nor is adequate infrastructure to support large-scale deployment available. More testing, which the ports, the regulatory agencies, and the drayage and trucking industries are conducting, will likely demonstrate the suitability of those vehicles in at least some aspects of drayage service; as the technology becomes commercially viable it will be deployed in accordance with the goals and strategies of the 2017 CAAP. As the technology for zero-emission trucks is still unproven and, thus, cannot be deemed feasible, such a measure would be unenforceable and imposing it would be a violation of CEQA.

In addition, as the Drayage Truck Study shows, mandating the use of a particular technology in drayage service at a single terminal is infeasible, as individual terminals have little or no control over drayage trucks and would be placed at a severe competitive disadvantage if forced to turn away other technologies. Furthermore, as described in the Drayage Truck Study, the port-area drayage industry involves approximately 15,000 trucks, only a very few of which (i.e., those currently in demonstration testing) are zero-emissions. Ensuring that only zero-emissions trucks serviced the CS Terminal would require replacing the current diesel-powered fleet with zero-emissions units. Even if the technology were ready for deployment in regular service, that replacement would cost an estimated 3 to 5 billion dollars just for the vehicles (POLB and POLA, 2017), and the charging infrastructure to support the fleet would be many millions more. Such an expenditure is clearly infeasible as mitigation for a single project.

The Port has worked diligently with the Port of Long Beach, the SCAQMD, CARB, and the drayage industry for well over a decade to reduce the emissions of air pollutants from the drayage fleet serving San Pedro Bay marine terminals. Through the Clean Trucks Program, the older, high-polluting trucks that characterized the drayage fleet in the 1990s have been replaced by trucks meeting 2007 and 2010 engine standards. The Clean Truck Program was successful in large part because of massive financial support by the Ports and regulatory agencies in the form of grants, incentives, and outright purchase of older trucks. The result, as stated in the 2017 CAAP (p. 33) has been a 97% decrease in emissions of diesel particulate matter, the principle toxic air contaminant associated with trucks, since 2005. The CAAP acknowledges that trucks remain a significant source of air pollution and has committed the Ports to a goal of transitioning the drayage fleet to zero-emissions technologies by 2035. This is an aggressive goal, considering that, as explained above, zero- and near-zero-emissions drayage trucks have not yet been certified as feasible technologies. The transition will require substantial effort and financial support by all parties involved -- the ports, the regulatory agencies, the drayage industry, and the truck manufacturing industry -- because the issue must be addressed on a port-wide basis, not a project-by-project basis.

Finally, the suggestion to include a “Short-Haul Truck Phase-In Plan” and a “Long-Haul Truck Phase-In Plan” as a mitigation measure lacks any detail regarding what circumstances it would apply to, who would be responsible for implementing it, and how the drayage industry would be affected by it. Accordingly, it cannot be evaluated or responded to in this FSEIR.

Response to Comment CFASE-3

The basis for the figures cited in the comment is unclear. Table 2-3 of the Recirculated DSEIR shows that the CS Terminal handled 1.088 million TEUs in 2014, 19% through the on-dock railyard, and is projected to handle 1.698 million TEUs in 2036-2045, 14% through the on-dock railyard. Accordingly, the increase in terminal throughput is projected to be approximately 610,000 TEUs, and the increase in on-dock rail throughput approximately 31,000 TEUs, or 15%. Note that 2014 is not a baseline year in either the 2008 EIS/EIR (the baseline is 2000-2001) or in the Recirculated DSEIR (the baseline is 2008). Note also that the increase in terminal throughput that is projected in the Recirculated DSEIR is not attributable to any feature of the Revised Project, but is based market forces that are entirely independent of the Revised Project. See Section 1.4.1 of the Recirculated DSEIR.

The comment is incorrect in stating that an increase in on-dock rail throughput will result in more locomotive emissions in future years 2036-2045 than in 2014. Rail activity will increase somewhat in the future. However, the emission factors for locomotive engines are expected to decrease proportionately more for criteria air pollutants such as NOx, PM and VOC, due to the projected turnover of the locomotive and switcher fleet towards a higher mix of cleaner engines (assuming no major breakthroughs in locomotive emission controls). Accordingly, as shown in Table RTC CFASE-3, below, future emissions of those pollutants would be substantially lower than current emissions.

Table RTC CFASE-3: Annual locomotive emissions (switchers and line-haul combined) in tons per year for the Revised Project

Pollutant	Year	Rail Offsite	Rail Onsite	Total (tpy)
NOx	2008	199.504	13.085	212.589
	2012	176.470	12.060	188.530
	2014	171.443	12.591	184.034
	2018	202.644	11.645	214.290
	2023	243.945	11.958	255.903
	2030	177.252	8.501	185.754
	2036	114.603	5.980	120.583
	2045	62.075	3.809	65.884
VOC	2008	10.431	0.693	11.125
	2012	8.714	0.600	9.314
	2014	7.519	0.563	8.083
	2018	7.692	0.462	8.154
	2023	8.739	0.445	9.184
	2030	6.105	0.309	6.413
	2036	3.883	0.217	4.100
	2045	2.274	0.152	2.427
PM10	2008	7.037	0.455	7.492
	2012	5.904	0.383	6.288
	2014	5.066	0.350	5.416
	2018	5.036	0.269	5.306
	2023	5.536	0.259	5.796
	2030	3.608	0.164	3.771
	2036	2.052	0.100	2.152
	2045	0.943	0.053	0.996
CO	2008	35.234	2.369	37.602
	2012	37.607	2.728	40.335
	2014	38.603	3.025	41.629
	2018	45.119	2.820	47.939
	2023	67.954	3.443	71.397
	2030	71.165	3.419	74.584
	2036	67.272	3.384	70.656
	2045	61.918	3.383	65.301

Note: these emissions are found in Table B1-669 "Proposed Mitigated Scenario Annual Emissions by Source Category and Analysis Year in ton/year" in Appendix B1 of RDSEIR. Page B1-352

For some pollutants such as CO, SO_2, and CO_2, the emissions would not decrease over time because emission factors for those pollutants are not affected by the Tier level of the fleet (e.g., CO in Table RTC CFASE-3); in that case the emissions trend is driven by the on-dock rail throughput. However, those emissions would be less than were analyzed in the 2008 EIS/EIR because on-dock rail throughput is forecasted to be lower: as shown in Table 2-3 of the Recirculated DSEIR, the 2008 EIS/EIR assumed that 17% of 1.551 million TEUs, or approximately 264,000 TEUs, would be handled on-dock, whereas the Recirculated DSEIR assumed, on the basis of the Port's updated cargo forecasts, that 14% of 1.698 million TEUs, or approximately 238,000 TEUs would be handled on-dock. Accordingly, locomotive emissions from the Revised Project would not be greater than those of the Approved Project.

Note, too, that locomotive emissions are addressed in the 2017 CAAP and are not, in any case, an issue that can be solved on a terminal-by-terminal basis because of the nature of locomotive operations, which range from port-wide (for PHL switching units) to nation-wide (for Class 1 line-haul units). Please see Master Response 3: Port-Wide Emission Reduction Programs for more information on the issue of locomotive emission reduction measures.

Greenhouse gas emissions from rail activity associated with the Revised Project are analyzed in compliance with CEQA in section 3.2 of the Recirculated DSEIR. Those emissions do not violate AB 32 or AB 617, which concern regulation of greenhouse gases at the statewide level and thus do not apply directly to the Revised Project.

Response to Comment CFASE-4

The LAHD disagrees with the comment's contention that there are "numerous available, feasible technology mitigation" that could be adopted in the SEIR that are not already included in the Revised Project. The LAHD reviewed the brand and model names listed in the attachment referenced by the comment (please see Master Response 2: Zero- and Near-Zero-Emission Technologies) and concluded that 1) most are not relevant to the CS Terminal (for example, passenger train locomotives, light-duty and delivery trucks, light-duty forklifts, all construction equipment, refuse and fire trucks, school buses, taxis, and mining equipment), and 2) those that are relevant or potentially relevant (e.g., cargo-handling equipment, freight locomotives, heavy-duty trucks, and forklifts) have been considered and incorporated into the Revised Project where feasible. Note, too, that the ship-to-shore wharf cranes at the CS Terminal are already electric-powered, as are all of the wharf cranes at container terminals in the Port. Please see Master Response 2: Zero- and Near-Zero-Emission Technologies for a detailed analysis of the feasibility of the listed technologies.

Response to Comment CFASE-5

MM AQ-9 as currently written does apply to all vessels that call at the CS Terminal, regardless of the company that operates them. The meaning of the comment's statement, "the China Shipping Terminal currently has the shore-power capability of 100% compliance rate by 2019" is unclear. If, as seems likely, it is intended to imply that there is no reason why all vessels cannot use shore power, then LAHD disagrees: in fact, as described below, some of the vessels that call at the CS Terminal do not have the capability to use shore power.

The comment provides no rationale or requirement under CEQA for demanding that shipping companies provide 30-day notification of their plans, and the commenter may be unaware that the Port has already expended considerable sums of money in developing, with GE Transportation, the Port Optimizer system, which provides real-time data on supply chain modes, including 14-day advanced visibility for vessel tracking. In addition, the Port already requires 72-hour notice by AMP-capable vessels. Finally, please note that the Port has no role in scheduling vessels or arranging for AMECS or METS-1 services for non-AMP-capable vessels; that is a private business arrangement between the shipping company and the service provider.

MM AQ-9 does require the use of an alternative emissions at-berth emission control capture system; the only difference between MM AQ-9 and the comment's demand is that MM AQ-9 recognizes the possibility that an alternative system may not be available for every non-AMP-capable vessel that calls, as described below; therefore, the air quality impact analysis appropriately considers lower utilization rates that are feasible and attainable. Also, the LAHD does not agree that only one company can provide alternative treatment: CAEM's MET-1 system is also in operation in the Port. Please see also Master Response 3: Port-Wide Emission Reduction Programs for more detail on AMP.

The LAHD does not agree that the AMECS system is "100% feasible and available technology". AEG's AMECS is, as the comment points out, CARB-certified, and has been utilized in the two ports as an alternative to AMP for at-berth emissions control. Although AMECS and the similar METS-1 system (also CARB-certified) have been in operation in the Port, the number of units they deploy is limited, meaning that any time more vessels in the San Pedro Bay port complex need at-berth emissions control than AEG and CAEM have units available, the additional vessels will not be able to achieve emission control.

This observation is supported by data the LAHD has collected specifically for the CS Terminal (2018 AMP or Equivalent Data at CS Terminal from the Marine Exchange and e-mail communication from M. Wheeler to L. Ochsner 2-27-2019). In 2018, 98% of all ship calls at the CS Terminal utilized AMP or an AMP-equivalent technology. The vessel *Kristina* was not able to use AMECS or METS-1 because both systems were in use at other terminals during at least two visits. In addition, due to infrastructure issues and an emergency, at least two other vessels (*NYK Daedalus* and *ER Felixstowe*) were not able to use AMP or an equivalent technology. As shown in Table 2-1 in Section 2.2.3 of the Recirculated DSEIR, 100% AMP or AMP equivalent for all ship calls at the CS Terminal has not been achieved for any year from 2008 to 2017; the same was true in 2018. These facts illustrate the inability of any terminal to achieve emissions reductions for 100% of vessels and justifies the language of MM AQ-9 (and the analysis to support this measure for all future years, since it does not overestimate reductions by assuming 100% compliance) as presented in the Recirculated DSEIR.

In summary, the LAHD encourages all tenants to meet 100% utilization of shore power but recognizes that real-world conditions prevent achievement of that goal, as described in the discussion of MM AQ-9 in Section 2.5.2.1 of the Recirculated DSEIR. Please see also Master Response 3: Port-Wide Emission Reduction Programs for more detail on AMP.

The commenter states, "At this time only one company technology has been certified by the California Air Resources Board that can service all container ships which is the Advanced Environmental Group – AMECS: Advanced Maritime Emissions Control System. This is a 100% feasible and available technology contrary to your conclusion. An order can be placed and delivery within 6-12 months." Even if this may accurately describe the ordering process, it nevertheless ignores the challenges of deploying those additional units once they arrive. At present there are only two barge-mounted units in the ports and they have been accommodated at available locations. However, as the 2017

CAAP points out (p. 63), there are numerous impediments to deploying enough emission-control systems to handle the entire fleet, given the space and safety constraints for at-berth systems, whether barge-based or land-based. Operational and infrastructure assessments are needed for the deployment of additional alternative at-berth control units, including technologies other than the barge-based AMECS and METS-1, to service the San Pedro Bay ports complex.

A recent analysis (POLB and POLA, 2019) summarizing the challenges facing barge-based alternative control systems concluded that alternative compliance systems could actually increase greenhouse gases, have not had safety issues adequately resolved, and are not obviously cost effective, considering the already-high rate of at-berth emissions control for containerships. That analysis also pointed out the challenges of finding berthing space for barge-based technologies, given the high proportion of waterfront space already leased, and casts doubt on the commenter's statement regarding delivery times, given that no facilities are currently producing either the AMECS or the METS-1 systems.

With respect to the suggested per-container "tariff" and the use of the resultant revenues, please see Response to Comment CFASE-9.

Response to Comment CFASE-6

The commenter presents no data or evidence to support the assertion that AMECS is more efficient at capturing and treating emissions than AMP, and lacking such data or evidence, LAHD has no basis for accepting that statement as "fact". AMP eliminates all at-berth emissions from auxiliary engines because those engines are shut down once AMP is connected. AMECS, on the other hand, captures 80 – 90% of the emissions from auxiliary engines once it is connected (80% when connected to two auxiliary engine ports, 90% when connected to one) and treats them to a certified control efficiency of 95% for $PM_{2.5}$ and 90% for NO_X (CARB Executive Order AB-15-02; https://www.arb.ca.gov/ports/shorepower/eo/ab-15-02.pdf); note that the AMECS generators produce untreated emissions of their own. The net result is that AMP results in zero emissions while AMECS does not.

Note, too, that the AMECS system may not be able to provide effective emissions control for the largest vessels that call at the Port. CARB has certified the system to handle auxiliary engines with power ratings up to 3,700 kW, but container vessels over 12,000 TEUs capacity (and some smaller vessels) have auxiliary engines with higher power ratings. For those vessels, which in 2017 amounted to approximately 10% of vessel calls (A. Coluso, pers. comm.), there is no information regarding the emissions capture and control efficiencies. AMP-capable vessels are not so limited: every AMP-capable vessel can connect with the shore-based electrical grid.

Response to Comment CFASE-7

CEQA requires that a lead agency adopt a program for monitoring and/or reporting to ensure that mitigation measures imposed for a particular project are implemented in accordance with the program and by the responsible entities that are identified. CEQA does not mandate specific requirements for the program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. The MMRP for the Revised Project specifies the requirements of each mitigation measure, the timing of when the measure is required to be implemented, the responsible party for carrying out the measure, the responsible party for monitoring and oversight of the mitigation measure, and the applicable reporting requirements of the mitigation measure such as annual reports to the Board to disclose the status of mitigation measures. There is no requirement under CEQA that the lead agency must compile or publish any compliance report from its oversight of the mitigation monitoring and reporting program. Nonetheless, for non-CEQA purposes, the comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Response to Comment CFASE-8

In Table 2-1 the Recirculated DSEIR did disclose the VSRP compliance of vessels calling the CS Terminal in 2014. The commenter errs in characterizing that compliance as 99%, since compliance between 20 and 40 nm was actually 96%. Furthermore, the commenter gives no technical basis for recommending 100% compliance despite the Recirculated DSEIR's (Section 2.5.2.1) and the 2017 CAAP's (Section 1.4) explanations for why 100%, while a goal, is not a reasonable compliance mandate given the uncertainties involved in vessel operation. Accordingly, the LAHD maintains that the compliance requirement of 95% as stated in MM AQ-10 represents the maximum feasible mitigation.

Response to Comment CFASE-9

The commenter is suggesting a monetary penalty or fee for failure to comply with a mitigation measure. CEQA does not mandate specific requirements for a mitigation program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. Monetary penalties are not required by CEQA to be included as enforcement mechanisms in a mitigation program. The LAHD does not agree that a penalty for non-compliance with the VSRP would be effective mitigation designed to minimize the Revised Project's significant environmental impacts (Public Resources Code §§ 21002.1(a), 21100(b)(3).) Providing a penalty could encourage non-compliance with the mitigation measures, as an operator could opt to pay the penalty rather than comply with the mitigation measure.

Per CEQA, LAHD will adopt a mitigation monitoring and reporting program designed to ensure compliance with mitigation measures during the implementation of the Revised Project. As stated in the Recirculated DSEIR, LAHD implements mitigation measures on container terminal projects by including them in leases with its tenants. Although there are procedural requirements and approvals described in Sections 1.8.1 and 1.8.2 of the Recirculated DSEIR related to implementation or non-implementation of the Revised Project, the lease amendment process to incorporate and enforce mitigation measures is a separate action, requiring the Board's approval, that would be subject to a negotiation process and LAHD's leasing policy (LAHD, 2013b). Currently, LAHD's leasing policy does not contain any provisions for penalties or fees associated with non-compliance with mitigation measures or environmental requirements. The leasing policy requires tenants to comply with all applicable environmental standards including, but not limited to, federal, state, and local laws and regulations. It allows environmental deposits to be created, depending on risk factors associated with the tenant's use of the leasehold. These policies are all subject to a negotiation process until such time a lease is brought to the Board for consideration and approval. Nonetheless, for non-CEQA purposes, the comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Although the commenter has recommended a calculation method to impose penalties for non-compliance with the VSRP at $100 per container for containerships and $1.00 per metric ton of cargo for non-containerships, the commenter provides no data or evidence to support how this monetary contribution is proportional to the environmental impact resulting from failure to comply with VSRP. The commenter also recommends that 50% of the funds should go towards "the POLA Harbor Enforcement Program," which is undefined by the commenter and currently does not exist at the Port, and 50% towards the Harbor Community Benefit Foundation (HCBF) for off-port community environmental impacts.

With respect to the HCBF, please see Response to Comment CFASE-14, below. Regarding the comment that LAHD is required to publish a compliance report, please see Response to Comment CFASE-7.

Response to Comment CFASE-10

The LAHD disagrees that there are near-zero-emissions yard tractors that could be deployed immediately. The list of equipment referred to by the commenter was attached to the comment letter as "Zero Emission Transportation Vehicles, Cargo Handling Equipment & Construction Equipment Commercial Availability Survey." The list includes over 400 models of various types of equipment, both near-zero- and zero-emissions units. The Port commissioned an expert review of the list by Gladstein Neandross & Associates (GNA) to determine which units are potentially feasible for marine terminal service. GNA (2019) found that the majority of the listed equipment are either irrelevant to container terminal operations (e.g., light-duty trucks and vans, construction equipment, passenger trains, school buses, and fire and refuse trucks) or are not types of equipment included in the Revised Project's mitigation measures (e.g., rail-mounted gantry cranes). That process resulted in 187 pieces of equipment (nearly half of them light-duty forklifts) that were potentially relevant to the CS Terminal; those models were subjected to basic technical screening criteria for operation in a container terminal.

The 82 pieces of equipment that passed the technical screening criteria included forklifts, yard tractors, electric rubber-tired gantry cranes (ERTGs), shuttle buses, and drayage trucks. Those units were then screened for commercial availability by contacting manufacturers. The results of that screening are presented in Table RTC CFASE-10a, below, and include five yard tractor models. Ten of the 82 units (three forklifts, six shuttle buses, and an RTG) could not be evaluated for commercial availability because the manufacturers did not respond to contacts, but GNA concluded on the basis of other information that two of the forklifts and all six shuttle buses would not be available.

Table RTC CFASE-10a. Results of GNA Screening for Commercial Availability

Make	Model	Commercial Availability
	Forklift (5-10-ton capacity)	
Clark	GEX 40/45/50 Series Electric Forklifts	Pass
Doosan	B40/45/50X-5 Series Electric 4-Wheel Forklift	Pass
Hangcha	A Series 4 Wheeled Forklift	Pass
Hangcha	J Series 4 Wheeled Forklift	Fail: Out of production
Hyster	J80-100XN Series Electric Pneumatic Tire	Pass
Hyundai Construction	Series 9 50B-9 Four Wheeled Forklift	Pass

Make	Model	Commercial Availability
Kalmar	ECG50	Pass: Europe now, NorthAm in 2019
Kalmar	ECG90	Pass: Europe now, NorthAm in 2019
Yard Tractor		
BYD Motors	8TT Battery Electric Tractor	Pass
BYD Motors	8Y Tractor	Pass
Kalmar Ottawa	T2E Electric Terminal Tractor	Pass
Orange EV	T-Series 4x2 Terminal Truck	Pass
Orange EV	T-Series 4x2 Terminal Truck Conversion of Kalmar Ottawa	Fail: Not available
Orange EV	T-Series Reman (Conversion/Repower)	Pass
Transpower	ElecTruck Yard Tractor	Fail: Not available
Electric Rubber-Tired Gantry (RTG) Crane		
Kalmar	E-One2 Zero Emission RTG	Pass
Konecranes	Electric Cable Reel RTG	Pass
Konecranes	Electric Busbar RTG	Pass
Liebherr Container Cranes	e-RTG	Pass
Terex Port Solutions	E-RTGs	Fail: Not available
Kalmar	E-One2 Zero Emission RTG	Pass
Passenger/Shuttle Buses		
BYD Motors	C6 23-Ft Zero-Emission Electric Motor Coach	Pass
BYD Motors	K7M 30-Ft All Electric Zero-Emission Transit Bus	Pass
BYD Motors	K9S 35-Ft Zero-Emission Transit Bus	Pass
BYD Motors	K9M 40-Ft All Electric Zero-Emission Transit Bus	Pass
BYD Motors	C9 40-Foot Zero-Emission Electric Motor Coach	Pass
BYD Motors	C10M 45-Ft Articulated All Electric Coach	Pass
GreenPower	EV350 40-Foot All Electric	Pass
GreenPower	EV550 40-Foot All Electric Double Decker Bus	Pass
GreenPower	SYNAPSE 72 All Electric Shuttle Bus	Pass
GreenPower	EV STAR	Pass
International IC Bus	IC charge All-Electric Bus	Fail: Not available
Mercedes-Benz	eCitaro	Fail: not in US market
Motiv Power Systems	EPIC 4 Passenger Bus	Pass
Motiv Power Systems	EPIC 6 Passenger Bus	Pass
New Flyer	Xcelior XE 35 Bus with Lithium-Ion Battery Pack	Pass
New Flyer	Xcelior XE 40 Bus with Lithium-Ion Battery Pack	Pass
Phoenix Motorcars	(ZEUS) Zero Emissions Utility Shuttles	Pass
Proterra	Catalyst FC 35-Foot Urban Transit Bus	Pass
Proterra	Catalyst XR 35-Foot Urban Transit Bus	Pass
Proterra	Catalyst E2 35-Foot Urban Transit Bus	Pass
Proterra	Catalyst FC 40-Foot Urban Transit Bus	Pass

Make	Model	Commercial Availability
Proterra	Catalyst XR 40-Foot Urban Transit Bus	Pass
Proterra	Catalyst E2 40-Foot Urban Transit Bus	Pass
Solaris	Urbino 8 LE Electric Bus	Fail: not in US market
Solaris	Urbino 9 LE Electric Bus	Fail: not in US market
Solaris	Urbino 12 LE Electric Bus	Fail: not in US market
Toshiba	Sora FC EV Bus	Fail: not in US market
VDL Bus & Coach	Citea SLF-120 Electric Bus	Fail: not in US market
VDL Bus & Coach	Citea SLF-121 Electric Bus	Fail: not in US market
VDL Bus & Coach	Citea LLE - 99 Electric Bus	Fail: not in US market
Zenith Motors	Electric Mini Bus	Pass
Drayage Trucks		
BYD Motors	8TT Battery-Electric Truck	Pass
Efficient Drivetrains Inc	Battery-electric Class 8 truck	Fail: not available
Efficient Drivetrains Inc	Plug-in Hybrid Class 8 truck	Fail: not available
Kenworth	ZECT T680 Hydrogen Fuel Cell	Fail: not available
Kenworth	PHET with CNG range extender	Fail: not available
Hydrogenic/Siemens	Fuel cell range extended truck	Fail: not available
Nikola	Nikola One	Fail: not available
Toyota	Electric Class 8 Truck- Hydrogen Fuel Cell	Fail: not available
TransPower	ElecTruck	Fail: not available
Transpower	ElecTruck with fuel cell range extender	Fail: not available
Transpower/Peterbilt	Battery-electric Class 8 truck	Fail: not available
US Hybrid	Electric Class 8 Truck- eTruck	Fail: not available
US Hybrid	Electric Class 8 Truck - H2Truck	Fail: not available
Volvo	Plug-in hybrid Class 8 truck	Fail: not available
Volvo	VNR Class 8 Electric truck	Fail: not available

Source: GNA (2019) Table 4

GNA determined that five yard tractor models are represented by manufacturers as being commercially available (Table CFASE -10a). They point out that BYD's 8TT model is actually an on-road truck and that the appropriate yard tractor model would be the 8Y, and that the two Orange EV models are the same basic tractor, one being a re-power and the other a new build. Accordingly, there are essentially three commercially available, zero-emission yard tractors: BYD 8Y, Kalmar T2E, and Orange EV T-Series. GNA further evaluated the suitability of those three models and determined that none of these models demonstrated the ability to complete two consecutive shifts in marine terminal operations without requiring an intermediate charge between first and second shifts (Table CFASE-10b), and that the operational feasibility of such a charging event was uncertain. This, as well as other operational issues, needs to be resolved in demonstration testing, meaning that these three models are not yet ready for large-scale deployment. As described in Master Response 2: Zero- and Near-Zero-Emission Technologies, further testing, which is underway at several San Pedro Bay marine terminals, is needed to establish the operational viability of battery-electric yard tractors (the only zero-emission technology currently available for yard tractors).

Table CFASE-10b. Estimated Shift Capacity for Battery-Electric Yard Tractors

Model	BYD 8Y	Kalmar T2E	Orange EV
Basic Specifications	**Yes**	**Yes**	**Marginal** (top speed)
Standard 2-shift Endurance	**Marginal** (single charge) **Yes** (inter-shift charge)	**Marginal** (single charge) **Yes** (inter-shift charge)	**No** (single charge) **Yes** (inter-shift charge)
Extended 2-shift Endurance	**No** (single charge) **Yes** (inter-shift charge)	**No** (single charge) **Marginal** (inter-shift charge)	**No** (single charge) **No** (inter-shift charge)
3-Shift Endurance	**No**	**No**	**No**

Source: GNA 2019

The commenter states that there are "Zero Emission Yard Tractors currently available that can meet all short-haul requirements…by 2019". Because yard tractors, as off-road vehicles, are not used for short-haul applications (i.e., short trips outside the terminal), that portion of the comment (CFASE-10 item b) is not relevant to the Revised Project and requires no further response.

Response to Comment CFASE-11

The commenter suggests a monetary penalty or fee for failure to comply with a mitigation measure. CEQA does not mandate specific requirements for the program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. Enforcement mechanisms, such as penalties, are not required by CEQA to be part of the program. The LAHD does not agree that a penalty for non-compliance with the schedule would be effective mitigation designed to minimize the Revised Project's significant environmental impacts (Public Resources Code §§ 21002.1(a), 21100(b)(3).) Providing a penalty could encourage non-compliance with the mitigation measures, as an operator could opt to pay the penalty rather than comply with the mitigation measure. Per CEQA, LAHD will adopt a mitigation monitoring and reporting program designed to ensure compliance with mitigation measures during the implementation of the Revised Project. Nonetheless, for non-CEQA purposes, the comment is noted and is hereby part of the Final EIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project. Please see Response to Comment CFASE-9 for more information on how LAHD implements mitigation measures on container terminal projects by including them in leases with its tenants.

Although the commenter has recommended a calculation method to impose penalties for non-compliance with the measure's schedule at $100 per container lift, the commenter provides no data or evidence to support how this monetary contribution is proportional to the environmental impact resulting from failure to comply with schedule. The commenter also recommends that 50% of the funds should go towards a POLA fund for "New Yard Tractor purchases", which is undefined by the commenter and currently does not exist at the Port, and 50% towards the Harbor Community Benefit Foundation (HCBF) for off-port community environmental impacts.

With respect to the HCBF, please see Response to Comment CFASE-14.

Response to Comment CFASE-12

The commenter states that there are "Near-Zero Emission Cargo-Handling Equipment (CHE) currently available that exceed Tier 4 Final Off-Road Engine standards that can meet all requirements…by 2019" and refers to "CFASE Attachment." It is unclear which, among the 400-plus models in the attachment, are meant to represent near-zero-emissions models exceeding Tier 4 requirements, and without specific details, no further analysis is possible. Please note, however, that MM AQ-17 accommodates and encourages, through the emission standards in the measure, the use of near-zero-emission CHE. Specifically, the requirements for top handlers, RTGs, and yard tractors in MM AQ-17 ensure that the CS Terminal will, in the short term, utilize near-zero-emission units in terminal operations.

The LAHD agrees with the statement that "Zero Emission Cargo Handling Equipment (CHE) currently available that can meet all requirements requirement by 2019," although only with respect to RTGs, small-capacity forklifts, and shuttle buses. As the GNA analysis shows (GNA, 2019), there are no available zero-emission top handlers, large-capacity (18-ton) forklifts, or street sweepers; note, too, that the remaining CHE types on the attachment, such as straddle cranes, shuttle carriers, rail-mounted gantry cranes, and reach stackers, are not relevant to the CS Terminal. Table CFASE-10a, above, shows the available zero-emission RTGs, forklifts, and shuttle buses.

As the GNA analysis indicates, electric RTGs (ERTGs) are widely available and need only a suitable terminal configuration (long rows of container stacks) and electrical infrastructure to be feasible (see Master Response 2: Zero- and Near-Zero-Emission Technologies for more detail). In the case of the CS Terminal, the Recirculated DSEIR (pp. 2-19 – 2-20) explains that a portion of the terminal is already suitably configured for ERTGs, whereas the remainder of the terminal has short container stack rows, which makes the deployment of ERTGs inefficient.

Numerous zero-emissions forklifts are listed in the CFASE attachment. However, the GNA analysis (GNA, 2019) showed that only a few models are suitable for marine terminal applications because most of the listed models either have inadequate capacity (less than 5 tons) or have other design constraints. GNA did identify seven small-capacity (up to 10 tons) models that could be suitable and that are commercially available (Table RTC CFASE-10a); three other models could not have their availability confirmed and GNA concluded that they are unavailable.

The CFASE attachment lists 43 models of shuttle buses represented by the list's title to be zero-emissions technology. Some did not pass GNA's preliminary screening because they were too large for container terminal use (GNA, 2019). Of the remaining 31 models (Table RTC CFASE-10a), 22 were found to be commercially available. Six other models could not have their availability confirmed and GNA concluded that they are unavailable. GNA further screened the available shuttle buses to identify models in the shorter lengths optimal for container terminal operations (maneuverability and passenger capacity of 12-20 are preferred). They found three such models, all of which had sufficient range and charging profiles to be suitable, and the LAHD accordingly concludes that the technology is feasible for deployment. GNA observed that the purchase price of the three models ranges from $230,000 to $325,000, three to four times CARB's estimate for a baseline-model shuttle bus. That means that the incremental cost of replacing WBCT's three shuttle buses would exceed $500,000 and could approach $1 million.

The Revised Project incorporates zero- and near-zero-emissions technologies for RTGs, forklifts, and shuttle buses to the extent feasible. Specifically, MM AQ-17 requires that the CS Terminal deploy zero-emission technology for shuttle buses and small-capacity forklifts because those are technologically feasible and commercially available. In the case of RTGs, MM AQ-17 requires that zero-emission units be deployed in that portion of the terminal for which they are suited and that near-zero-emission units (i.e, hybrid units) be deployed in the remainder of the terminal.

The LAHD disagrees with the statement that "there are Zero Emission Yard Tractors currently available that can meet all port and railyard requirements by 2019". Please see Response to Comment CFASE-10, and Master Response 2: Zero-and Near-Zero Emission Technologies for a detailed analysis of the feasibility of the yard tractor models listed in the CFASE attachment. Please note, too, that by requiring low-NO_X and Tier 4 engines, MM AQ-15 phases in near-zero-emission yard tractors.

Response to Comment CFASE-13

The commenter suggests a monetary penalty or fee for failure to comply with a mitigation measure. CEQA does not mandate specific requirements for the program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. Enforcement mechanisms, such as penalties, are not required by CEQA to be part of the program. The LAHD does not agree that a penalty for non-compliance with the Schedule would be effective mitigation designed to minimize the Revised Project's significant environmental impacts (Public Resources Code §§ 21002.1(a), 21100(b)(3).) Providing a penalty could encourage non-compliance with the mitigation measures, as an operator could opt to pay the penalty rather than comply with the mitigation measure. Per CEQA, LAHD will adopt a mitigation monitoring and reporting program designed to ensure compliance with mitigation measures during the implementation of the Revised Project. Nonetheless, for non-CEQA purposes, the comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project. See Responses to Comments CFASE -9 and CFASE -11.

Response to Comment CFASE-14

The commenter states that offset credits coordinated with the California Air Resources Board or another appropriate entity are an unacceptable form of mitigation for the GHG impacts of the Revised Project. With respect to the comment that LAHD failed to conduct a survey of available mitigation technology, the Recirculated DSEIR cites (e.g., pp. 2-17 and 2-21), and relies on, the analysis of current emissions reduction technologies contained in Strategy 1 (Clean Vehicles and Equipment Technology and Fuels) of the 2017 CAAP. That analysis concludes that most of the zero-emissions and near-zero-emissions technologies and concepts being tested, developed, or promoted are not yet practicable for application to the maritime goods movement; recent technology reviews (POLA & POLB, 2018 and 2019; Tetra Tech/GNA, 2019a, b; GNA, 2019) confirm those conclusions (see Master Response 2: Zero-and Near-Zero-Emission Technologies for additional detail on the current status of zero-emission technologies). Accordingly, the technologies and standards included in the Recirculated DSEIR represent the currently available, feasible, CARB-certified technologies, consistent with CEQA requirements. Lease Measure LM AQ-1 commits the CS Terminal and the Port to reviewing and implementing new, cleaner technologies into terminal operations as they are proven and become commercially available, consistent with the goals of the 2017 CAAP, and Lease

Measure LM AQ-3 commits the terminal to conducting a demonstration of zero-emissions cargo-handling equipment, consistent with the goals of the 2017 CAAP.

With respect to the comment that mitigation funds should be provided to the Harbor Community Benefit Foundation for projects to reduce GHG impacts off-port property, the commenter provides no evidence or data that providing offset credits to the California Air Resources Board or another appropriate entity for GHG-reducing projects and programs on Port of Los Angeles property would be insufficient to mitigate the GHG impacts of the Revised Project. Furthermore, GHG emissions are a global level cumulative impact, not a localized impact. Accordingly, reduction of GHG emissions through mitigations focused on on-site sources would be as effective to reduce overall GHG cumulative impact of the Project as off-site mitigation measures, which, as explained below, the LAHD may not be able to implement. With respect to the off-port impacts mentioned in the comment, please note that the State Lands Commission has informed the Harbor Community Benefit Foundation that, "a legal justification must be carefully considered before the Port makes an expenditure of Public Trust funds from the Port Community Mitigation Fund" (letter from J. Lucchesi, SLC, to M. Reese, HCBF, December 6, 2017). Accordingly, the LAHD considers that no further response related to that issue is required.

With respect to the amount of the GHG funding, the comment gives no indication as to why the proposed amount of $250,000 is "inadequate" and how the appropriate amount to "mitigate the GHG Environmental and Public Health Impacts" of the Revised Project would be calculated. Furthermore, the demand for a study to determine costs for mitigation is too vague to justify a more detailed response. It is important to point out that the commenter incorrectly identifies the GHG Credit Fund as a mitigation measure. This measure is not required under CEQA to mitigate an identified impact but rather is proposed as a lease measure in the Recirculated DSEIR for the purposes of establishing a Greenhouse Gas Credit Fund to offset costs for GHG-reducing projects and programs on Port of Los Angeles property. Please note, however, that the lease measure (LM GHG-1) has been revised in the Final SEIR (see Chapter 3), substantially raising the amount of funding. The fund contribution amount is now based on the calculated maximum annual emissions of GHGs above the significance threshold and the current (2019) market value of carbon credits as established by CARB. As described in the measure, that calculation results in a payment of $250,000 per year for eight years, for a total contribution of $2 million. The measure has also been modified to incorporate a firm implementation schedule. Accordingly, the LAHD concludes that no further response is required.

Response to Comment CFASE-15

With respect to the availability of the technologies referred to in the comment, please see Response to Comment CFASE -14.

The request for quarterly reviews of current technology envisions a level of effort that would represent an inefficient use of public resources, given the current pace of zero-emission technology development. Furthermore, such a survey would be ineffective mitigation for a single project; instead, the LAHD believes that the periodic technology reviews provided through the CAAP updates and LM AQ-1 are the appropriate format for the information the commenter is seeking.

The comment concerning the LAHD's feasibility assessments is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment CFASE-16

The comment that LM AQ-2 is "acceptable" is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Response to Comment CFASE-17

See Master Response 2: Zero- and Near-Zero-Emission Technologies and Responses to Comments CFASE-14 and CFASE-15.

The comment's wording implies that the goals suggested in the comment (25% by 2020, 50% by 2023, 100% by 2025) are those of the CAAP, but that is not the case. As stated in the 2017 CAAP (p. 24), "the [Sustainable City pLAn] seeks to increase the percentage of Port-related goods movement trips that use zero-emissions technology to at least 15% by 2025 and 25% by 2035...On June 12, 2017, the Mayors of the cities of Los Angeles and Long Beach publicly signed a joint declaration affirming the commitment to move toward zero emissions at the Ports, including setting goals of zero-emission cargo-handling equipment by 2030 and zero-emission drayage trucks by 2035."

Response to Comment CFASE-18

The Recirculated DSEIR considered the impacts of truck trips associated with the Revised Project between the CS Terminal and the first point of rest (for import cargo, typically a near-dock or off-dock railyard, a distribution warehouse, a peel-off yard, or a transloading facility). Accordingly, the SEIR does consider the impacts of project-related trips to those types of facilities that are included in the commenter's list of destinations (and the attachment identifying specific businesses operating those destinations), and the mitigation measures in the SEIR address those impacts. However, the other facilities in the list, such as truck, chassis, and other equipment storage and maintenance facilities, truck fueling stations, container storage yards, fumigation facilities, and inspection points, represent facilities that are owned and operated by third parties, are not a part of the Revised Project, and are presumed to have undergone the appropriate environmental reviews and approvals. Accordingly, the truck trips generated by those operations are not evaluated in the SEIR.

Response to Comment CFASE-19

With respect to the freight transportation list and the Harbor Benefit Foundation issue, see Responses to Comments CFASE-18 and CFASE-14.

With respect to the port projects list, the comment lists 21 Los Angeles projects and 13 Long Beach projects, whereas the Recirculated DSEIR (Table 4-1) considers 39 Los Angeles projects, 7 Long Beach projects, and one joint LA-LB project. Eight of the Los Angeles projects included in the commenter's list were not included in the Recirculated DSEIR for the following reasons: 1) as of June 2017, when the cumulative projects list for this SEIR was developed, the Vopak and Nustar MOTEMS projects were on hold, as is still the case; 2) the commenter provides no information on the "Harbor Boulevard Roadway Improvements Project" so it is unclear where on Harbor Boulevard that project is located and whether it is ongoing or even a Port project; 3) the Removal of USTs at Cabrillo Marina was a one-time project completed in June 2017 and was determined to have no effect on potential cumulative impacts related to this SEIR; 4) the Wilmington Marina Parkway was a past project (2013) that was determined to have no effect on potential cumulative impacts related to this SEIR; 5) the Berths 177-178 Transit Shed Demolition Project is a past project to address fire damage that occurred in 2014 and was determined to have no effect on potential cumulative impacts related to this SEIR; 6) the US Navy Commissary Building Demolition Project is a past project (2014) to address building fire/life safety concerns and was determined to have no effect on potential cumulative impacts related to this SEIR; and 7) the John S. Gibson Blvd Port Development Truck Parking Center is no longer a reasonably foreseeable project.

For Long Beach, the comment lists five MOTEMS projects that are not on the Port of Long Beach's development list of projects or on the list of CEQA projects (see the Port's website under the Environment tab), while the remaining eight projects in the commenter's list are included in Table 4-1 of the Recirculated DSEIR; accordingly, the LAHD concludes that the list of projects considered in the SEIR's cumulative analysis is based on the most current and available information at the time of the analysis. Because the commenter does not identify any other specific deficiencies in the cumulative analysis, no further response is required (PRC 21091(d); CEQA Guidelines Section 15204(a)).

Response to Comment CFASE-20

It is unclear whether the comment proposes "alternative electric rail transportation technologies" as a project alternative or as a mitigation measure. If as an alternative, please note that, as stated in Section 1.7 of the Recirculated DSEIR, "a supplemental EIR is not required to consider alternatives to a component of the project. Rather, the alternatives analysis in the 2008 EIS/EIR appropriately considered alternatives to the project as a whole. The proposed modifications to the mitigation measures in the Revised Project do not change the Approved Project as a whole and do not require that an alternative be developed that specifically addresses those particular modifications."

If as a mitigation measure, the construction of an electrified container movement system of the sort referred to in the comment is not feasible for consideration as mitigation for the impacts of the Revised Project. As described in more detail in Master Response 2: Zero- and Near-Zero-Emission Technologies, these systems require very large capital investments, have extensive geographical coverage, fall under the purview of railroad companies, and are disproportionate to the impacts of an individual project. In 2008, EMMI Logistics estimated the building cost for a complete MagLev system at 4.4 billion dollars (by 2013), which is likely underestimated at this point in time (American Maglev Inc., 2008). Although LAHD can authorize additional loading tracks at on-dock yards within the Port boundaries, the alternative rail transportation system would have to extend well beyond the on-dock yards to areas beyond the Port's sole jurisdiction.

Such a measure would also require a substantial reorganization of the regional goods movement system, besides having widespread construction-related impacts of its own. A zero-emissions rail transportation system may be implemented by the goods movement industry, including the ports, in the future if it proves to be technologically and operationally feasible, practicable to build (considering jurisdictional, environmental, cost, and land use issues), and economically feasible to operate. The ports have participated in the evaluation of a number of zero-emissions container movement systems concepts, including the two mentioned in the comment (see the "Roadmap for Moving Forward with Zero Emission Technologies at the Ports of Los Angeles and Long Beach" [POLB and POLA, 2011]). Although they have concluded that there are no zero-emissions solutions for locomotives and rail transportation as a whole that can be implemented in the near term, they continue to be engaged in the identification, evaluation, and demonstration of zero-emission rail options, as set forth in the 2017 CAAP.

Finally, the "comprehensive technology survey of…Zero Emission Electric Train Technologies" referred to in CFASE's comment letter appears to be the attachment considered in Responses to Comments CFASE-10 and CFASE-12. That attachment does not contain any of the advanced technologies discussed in the comment and in this response, but instead lists conventional European and Asian electric locomotives.

Response to Comment CFASE-21

The LAHD disagrees with the comment's claims that 1) "there are numerous feasible technologies that can reduce air quality significant impacts that you are not including in the project or as proposed Mitigation Measures" and 2) "All referenced technologies are commercially available today and can be ordered with delivery within one year…" Please see Master Response 2: Zero- and Near-Zero-Emission Technologies for a detailed discussion of the feasibility and availability of such technologies. Please note that the terms Best Available Control Technology and Best Available Retrofit Technology are applicable only to stationary sources such as power plants, refineries, and chemical plants, and do not apply to the mobile sources that generate virtually all of the emissions from the CS Terminal's operations. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment CFASE-22

Please see the response to comment CFASE-21.

Response to Comment CFASE-23

Please see Master Response 2, and response to comments CFASE-4, CFASE-10 and CFASE-12.

Response to Comment CFASE-24

Please see response to comments CFASE-14 and CFASE-18.

2.3.2.5 Central San Pedro Neighborhood Council

Harbor Administration Building
425 S. Palos Verdes Street
San Pedro, California 90731
Commissioner@portla.org

CITY OF LOS ANGELES BOARD OF HARBOR COMMISSIONERS NEIGHBORHOOD COUNCIL SPEAKER REQUEST FORM

I, James Allen (President Name/Designee) declare that I am the President/Designee, respectively of the Central San Pedro Neighborhood Council (NC) and that on 11/13/18 (date adopted), a Brown Act noticed public meeting of this NC was held.

With a quorum of 13 (number) Board members present, the following vote was adopted on the Subject Matter of China Shipping SEIR (General/Agenda Item No.). The NC's position on the matter in question is:

- ☐ For
- ☐ Against
- ☐ Abstained

ATTACH THE APPROVED RESOLUTION/MOTION

The Neighborhood Council's representative shall provide the Board with a copy of the Neighborhood Council's Resolution/Motion.

IN WITNESS of the above action, the undersigned has executed and delivered this certificate in the name and on behalf of the Central San Pedro (NC Name) and as of the date set forth below.

Alexander Hall

Signature of NC President/Designee

Print Name: Alexander Hall

Date: 11/14/18

For Harbor Department Commission Office Use Only:

Board Meeting Date: ____________ Name of Speaker: ____________

General/Agenda Item No. ____________ Notes: ____________

Method Received ____________

*See Attachment

CeSPNC Port Committee resolution Oct. 2018 passed by vote 11/13/18

The Central San Pedro Neighborhood Council has significant concerns over the China Shipping SEIR, and for the previous lack of oversight regarding the court ordered mitigations.

CSPNC-1 We join with the NRDC in calling for "new mitigation monitoring and reporting plan with public disclosure of the status of all mitigation measures for all past and present POLA CEQA projects."

We believe reasonable minds would support a these actions to the DSEIR to the effect as the following:

CSPNC-2

- Identify and define the failures that resulted in the non-compliance with the Port of Los Angeles Mitigation Monitoring and Reporting Program Port of Los Angeles Master Plan Update, Program Environmental Impact Report

CSPNC-3

- State the corrective actions completed and to be completed to ensure compliance with EIR defined Mitigations Port-wide.
- State the corrective actions completed and to be completed to ensure compliance with the referenced Mitigation Monitoring and Reporting Program
- Develop and implement a public process wherein EIR defined Mitigations are presented in a yearly public meeting.
- Develop and implement a public process wherein the Mitigations specifically related to ADP No. 110518-060/SCH No. 2012071081 are presented in a yearly public meeting.

CSPNC-4

The actions we are asking for are these:

- Develop and implement a public committee and meeting venue in accordance with the Brown Act to allow for objective oversight of Port compliance with the California Environmental Quality Act through inclusion of the following specifically assigned representatives knowledgeable and responsible for the subjects to be discussed:
    1. Port staff with the technical knowledge to discuss impacts, technologies, operations etc.;
    2. South Coast Air Quality Management representative;
    3. California Air Resources Board representative;
    4. US Environmental Protection Agency representative;
    5. Industry representatives as subject matter experts that may be required for the varying subjects to be discussed (e.g., engine manufacturers, fuel distributors, etc.);
    6. Community representatives assigned by recognized agencies such as the City of Los Angeles Neighborhood Councils in closest proximity to the ports.

Thank you for your consideration to act on the above items and for your timely response to these matters of great significance to communities of the Greater Los Angeles Harbor area.

Sincerely,

Alex Hall, President of Central San Pedro Neighborhood Council

Response to Comment CSPNC-1

For a discussion on the disclosure of mitigation measures for the Revised Project, please see Master Response 4: Non-Compliance with Original FEIR Mitigation Measures. As to the disclosure of the status of all mitigation measures for Port CEQA projects, this is not a comment on the adequacy of the Recirculated DSEIR. Development of an MMRP to oversee and disclose CEQA compliance for all Port projects is outside the scope of this SEIR and is not required by CEQA. CEQA requires that a lead agency adopt a program for monitoring and/or reporting to ensure that mitigation measures imposed for a particular project are implemented in accordance with the program and by the responsible entities that are identified.

As part of the Final SEIR, an MMRP will be developed for the Revised Project. CEQA does not mandate specific requirements for the program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. The MMRP for the Revised Project will specify, at a minimum, the requirements of each mitigation measure, the timing of when the measure is required to be implemented, the responsible party for carrying out the measure, the responsible party for monitoring and oversight of the mitigation measure, and the applicable reporting requirements of the mitigation measure such as annual reports to the Board to disclose the status of mitigation measures. There is no requirement under CEQA that the lead agency must compile or publish any compliance report from its oversight of the mitigation monitoring and reporting program. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)). Nonetheless, for non-CEQA purposes, the comment is noted, is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Comment Number: CSPNC -2

This is not a comment on the adequacy of the Recirculated DSEIR. The MMRP prepared for the Port of Los Angeles Master Plan Update Program EIR (LAHD, 2013a) was designed to assess, at a program level, the environmental impacts of a long-range plan to establish policies and guidelines for future development at the Port. LAHD uses the Master Plan Update Program EIR's program-scale analysis to focus project-specific CEQA review for appealable/fill projects, including certain major terminal developments, and recommending mitigation measures identified in the Master Plan Update Program EIR MMRP that are appropriate and specific to those individual projects. As such, the MMRP for the Port Master Plan Update was not intended to serve as port-wide mitigation requirements for all POLA CEQA projects but rather is implemented at the individual project level, as appropriate (see page 1-2 of the Port Master Plan Update MMRP for further details). Discussion of mitigation measures and other pollution-reduction actions for Port projects other than the Revised Project is outside the scope of this SEIR and is not required by CEQA. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Comment Number: CSPNC -3

This is not a comment on the adequacy of the Recirculated DSEIR. Please see Responses to Comments CSPNC-1 and CSPNC-2. Discussion of mitigation measures and other pollution-reduction actions for Port projects other than the Revised Project is outside the scope of this SEIR and is not required by CEQA. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Comment Number: CSPNC -4

This is not a comment on the adequacy of the Recirculated DSEIR. See Response to Comment CSPNC-1. Formation of a committee to oversee CEQA compliance for all Port projects is outside the scope of this SEIR and is not required by CEQA. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

2.3.2.6 Coastal San Pedro Neighborhood Council

October 29, 2018

City of Los Angeles Harbor Department
Christopher Cannon, Director
Environmental Management Division
P.O. Box 151 San Pedro CA 90733-0151
ceqacomments@portla.org

Subject: Berths 97-109 [China Shipping] Container Terminal Project (SCH#2003061153) Comments Submittal

To whom it may concern,

For the Subject Project and for the failure to comply with the mitigations defined in the respective Year 2008 Environmental Impact Report for the China Shipping Project, please respond to the following recommendations.

CoSPNC-1 1) State the cause of the Port's management or system failure that resulted in the State Tidelands tenant violation of the referenced 2008 EIR and state the correction(s) that will preclude a repeat failure to comply with required environmental mitigations by Port tenants.

CoSPNC-2 2) As emissions of carbon monoxide, nitrogen oxides, and volatile organic compounds will be significant over multiple years, state the actions to reduce emissions of the listed pollutants elsewhere in the Port to ensure no net increase in the respective emissions and to remain consistent with the San Pedro Bay Ports Clean Air Action Plan.

CoSPNC-3 3) As cancer risks would be significant for residential, sensitive, and occupational receptor types, state the actions to reduce cancer risk elsewhere in the Port to ensure no net increase in the respective cancer risks and to remain consistent with the San Pedro Bay Ports Clean Air Action Plan.

CoSPNC-4 4) State the expected date (or time period) when the new lease amendment is expected to be filed.

Sincerely,

Douglas Epperhart

Doug Epperhart
President
On behalf of the Coastal San Pedro Neighborhood Council Board

Response to Comment CoSPNC-1

Please see Master Response 4: Non-Compliance with Original FEIR Mitigation Measures. This is not a comment on the adequacy of the Recirculated DSEIR. Please note that sections 1.2.3 and 1.2.4 of the Recirculated DSEIR already describe in adequate detail the background of the Revised Project, including the status of the lease with China Shipping and the reasons why some mitigation measures were not complied with.

Per CEQA, LAHD will adopt a mitigation monitoring and reporting program designed to ensure compliance with mitigation measures during the implementation of the Revised Project. CEQA does not mandate specific requirements for the program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. There is no requirement under CEQA that LAHD must provide a full public accounting of past activities at the Project site. Nonetheless, for non-CEQA purposes, the comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Response to Comment CoSPNC-2

Please note that both the 2008 EIS/EIR and the Recirculated DSEIR identified significant air quality impacts, and that CEQA does not require impacts to be reduced to below baseline levels. Furthermore, the 2017 CAAP does not include a policy of no net increase; instead, it seeks to minimize air quality impacts of port operations through the implementation of all feasible control measures. The comment does not reference any specific section of the Recirculated DSEIR; therefore, no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment CoSPNC-3

Please note that both the 2008 EIS/EIR and the Recirculated DSEIR identified significant impacts related to health risk, and that CEQA does not require impacts to be reduced to below baseline levels. Furthermore, the 2017 CAAP does not include a policy of no net increase in health risks and allows the Board of Harbor Commissioners discretion when considering projects for which cancer risk exceeds 10 per million (see POLB and POLA, 2011, p. 26). The comment does not reference any specific section of the Recirculated DSEIR; therefore, no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment CoSPNC-4

As mentioned in the Recirculated DSEIR (Section 2.5.2.1), the uncertainty in the timing of mitigation measures reflects the uncertainty in the time needed to certify the Final SEIR and negotiate and execute a new lease. A new lease or lease amendment cannot be executed until the Final SEIR is certified, and since that timing is unknown, it is not possible to provide a date for lease execution. However, the time period is assumed to be 2019 for analysis purposes only in order to disclose the potential environmental impacts of the Revised Project and the earliest possible timing of when certain mitigation measures can be imposed.

2.3.2.7 Natural Resources Defense Council et al.

& San Pedro and Peninsula Homeowners' Coalition
San Pedro Peninsula Homeowners United
Urban and Environmental Policy Institute, Occidental College

City of Los Angeles Harbor Department
Christopher Cannon, Director
Environmental Management Division
P.O. Box 151
San Pedro, CA 90731
ceqacomments@portla.org
Via Email and U.S. Mail

November 16, 2018

Re: Recirculated Draft Supplemental Environmental Impact Report – Berths 97-109 [China Shipping] Container Terminal Project

Dear Mr. Cannon,

On behalf of the Natural Resources Defense Council, San Pedro and Peninsula Homeowners' Coalition, San Pedro Peninsula Homeowners United, Coalition for Clean Air, East Yard Communities for Environmental Justice, Long Beach Alliance for Children with Asthma, and Urban & Environmental Policy Institute, Occidental College, we provide comments on the Recirculated Draft Supplemental EIR for Berths 97-109, China Shipping Container Terminal (RDSEIR).

NRDC-1

On September 29, 2017, we submitted comments on the Draft Supplemental EIR (DSEIR). These comments are directed to the RDSEIR and, accordingly, refer to and incorporate our September 29, 2017 comments where appropriate. We specifically request that our September 29, 2017 comments and all attachments to those comments be included in the administrative record for this project.[1]

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[1] These comments do not address the Port's violations of the 2004 Amended Stipulated Judgment (the Amended Stipulated Judgement or ASJ). *NRDC et al. v. City of Los Angeles et al.*, No. BS 070017 (Cal. Sup. Ct. June 14, 2004) (Amended Stipulated Judgment, Modification of Stay, and Order thereon). All signatories to this letter who were parties or members of parties

Our written comments below are organized as follows:

EXECUTIVE SUMMARY

We adopt and incorporate here the section entitled "Factual Context And Summary Of Concerns" from our September 29, 2017 comment letter on the DSEIR. We note that our concerns raised in that letter are largely unaddressed by the recirculated document, and as a result, many of our comments on the DSEIR are reiterated below and apply to the RDSEIR.

With respect to comments unique to the RDSEIR, we raise the following concerns, which are discussed in greater detail below:

NRDC-2

1. The RDSEIR's analysis of air quality impacts remains confusing and inadequate to inform the public of the project's impacts. The Port continues to use improper baselines and comparisons that hide (a) the full impacts of its noncompliance with the 2008 FEIR, and (b) the full impacts from the Revised Project. And the RDSEIR's air quality analysis relies on unsupportable assumptions that underestimate the Revised Project's truck and ship emissions.

involved in the ASJ reserve all rights with respect to breaches of the ASJ, and note that the Port's obligations under the ASJ are separate from and in addition to those required under CEQA.

NRDC-3

2. While the RDSEIR provides some data to calculate at least a part of the past and future "excess emissions" shouldered by the community, an analysis by an independent expert shows that **from 2009 to 2045, the Port's noncompliance results in excess emissions totaling at least 1,400 tons of NOx, 192 tons of VOCs, 3,623 tons of CO, 19 tons of PM 2.5, 20 tons of PM10, 25 tons of SOx, and 54 tons of DPM. And just looking at the *past* excess emissions caused by the Port's noncompliance with the 2008 EIR, local communities have *already* shouldered excess emissions totaling at least 778 tons of NOx, 82 tons of VOCs, 1,034 tons of CO, 11 tons of PM 2.5, 12 tons of PM10, 12 tons of SOx, and 18 tons of DPM. This is the equivalent of tens of millions of heavy-duty truck miles traveled—right in the communities near the Port.** These emissions have significant health impacts, ranging from aggravated asthma to cancer. Port neighbors were and continue to be exposed to a higher risk for these illnesses because of the illegal excess emissions from the China Shipping project.

NRDC-4

3. Despite having multiple chances to do so, the Port has failed to fully mitigate the past, current, and future emissions created by its noncompliance and the Revised Project. The Port has not shown that the mitigation measures it adopted in 2008 are now infeasible. And it has also failed to explain why the additional measures we proposed—made possible by technological advancements at other terminals, more aggressive measures the Port has required of its own tenants, the San Pedro Bay Ports' Draft Clean Air Action Plan, and the Mayors' zero emission goals—are also supposedly infeasible. These include enhanced measures for ship emissions, deploying zero emission technologies like those used to feasibly mitigate emissions at the Trapac[2] and Middle Harbor projects, taking older diesel trucks off the road and replacing them with zero emission trucks, creating mitigation funds for impacted communities, and ensuring proper oversight of mitigation for the China Shipping terminal so that noncompliance never recurs.

NRDC-5

In short, what we have learned from the DSEIR and RDSEIR is that there is no dispute that the Port's noncompliance with the 2008 EIR mitigation measures had significant negative impacts on the environment and local communities. Likewise, there is no dispute that the Revised Project would have additional significant impacts compared to the currently approved project, precisely because it would forego some of the mitigation measures imposed in 2008. However, the Port fails to adopt all feasible mitigation for the project's past, current, and future impacts, and thus, violates CEQA. By adopting zero emission equipment inside and outside of the fence line, the

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[2] *See, e.g.,* the Port-produced video at https://www.trapac.com/news/trapac-tomorrows-technology-today, which depicts feasible mitigation measures for intra-terminal cargo moves directly across the West Basin at the TraPac facility. There, the yard tractors and cranes that move and stack containers are zero emission and so will reduce NOx. If TraPac can operate this way under a Port of Los Angeles lease, so can China Shipping. And if China Shipping can't, despite the financial backing of the Government of China, it should be shut down. At 5:13 of this video, a China Shipping vessel can be seen at berth directly across from the TraPac site.

Port can start to mitigate the emissions that it illegally permitted to occur, but it has refused to do so.

NRDC-5

The Port must put an end to its years of delay on these issues. The FEIR was certified in 2008. In 2015, the Port revealed it violated pollution-cutting measures it promised to implement and committed to study and rectify the problem. It has now been three years since the Port revealed its noncompliance, and ten years since the project was approved. For more than a decade, emissions from the China Shipping terminal have been higher than they should have been. While we appreciate robust CEQA processes, this process had gone on too long. All the while, communities continue to suffer from the Port's violations while the Port operates and profits from the China Shipping terminal. And there seems to be no end in sight.

The Port must commit to finishing the CEQA process as soon as possible, and implementing the feasible mitigation measures set forth in this letter.

ERRORS IN THE RDSEIR

I. The RDSEIR's air quality analysis still violates CEQA

NRDC-6

The fundamental goal of an EIR is to inform decision makers and the public about the environmental consequences of a project. *Communities for a Better Env't v. City of Richmond*, 184 Cal. App. 4th 70, 88 (2010). Here, the Port's air quality analysis obscures important impacts, and thus violates CEQA.

In the DSEIR, the Port used a 2014 baseline for its air quality analysis. We explained in our prior comment letter why that baseline was illegal. Although the Port has moved the baseline to 2008, its analysis still fails to comply with CEQA. Since the approval in 2008, the Port repeatedly granted China Shipping waivers from the approved mitigation measures, meaning that local communities were subject to excess emissions in the past. Now, the Port proposes changes to the project analyzed and approved in 2008, which will subject local communities to excess emissions in the future.

Accordingly, the Port must evaluate two things in its analysis of air quality impacts: First, the Port must disclose and mitigate the *past* excess emissions that were caused by its failure to comply with the 2008 EIR mitigation measures. Second, it must analyze and mitigate the *future* emissions that will be caused by the Revised Project as compared to what would have happened under the approved project.

In short, because of the specific details of this project and its lengthy, complicated history, it is important that the Port carefully design its analysis and choose a baseline to answer those two critical questions. However, as explained below, the Port has failed to do so. The Port's failure to fully disclose, analyze, and mitigate these past and future excess emissions violates CEQA.

A. The Port must accurately account for and mitigate past excess emissions caused by its noncompliance with the 2008 EIR mitigation measures

i. Under CEQA, the Port must disclose and mitigate past excess emissions

NRDC-7

In the 2008 EIR and through the parties' Amended Stipulated Judgment, the Port committed to implement pollution-cutting measures for the China Shipping project. The 2008 EIR incorporated the mitigation measures that the Port agreed to in the Amended Stipulated Judgment. Those approved measures were set to phase in between 2004 and 2018.[3] In 2015, the Port revealed that it violated its commitments in the 2008 EIR and the Amended Stipulated Judgment. Only months after the Port certified the 2008 EIR, the Port began providing waivers to China Shipping, excusing it from complying with a key mitigation measure in the EIR: that a certain percentage of ships utilize shore-power. The Port also failed to enforce measures that would have further reduced pollution from ships, as well as trucks and cargo handling equipment. And even now, the Port is not in full compliance with the mitigation measures.

There is no dispute that the Port's noncompliance with the 2008 EIR mitigation measures had significant negative impacts on the environment and local communities. The Port admits as much in the RDSEIR (even though that analysis underestimates the emissions for the reasons described below, *see infra* Section I.A.ii.). Under CEQA, the Port must disclose, analyze, and mitigate these past excess emissions that were caused by the Port's violation of the 2008 EIR mitigation measures. *See Poet, LLC v. State Air Resources Board*, 12 Cal. App. 5th 52, 76 (2017) (requiring the agency to "carefully identify the informational deficit in its earlier environmental disclosure document and then show that deficit was put right").

The Port fails to do this in the RDSEIR, and instead states that any disclosure of past excess emissions is for "informational purposes only." *See, e.g.,* RDSEIR at 3.1-5. But the Port is wrong. It must catalogue and sum all excess emissions caused by cheating from all years, from when the first mitigation measures were supposed to be implemented in 2004 to the present, and offset those emissions by requiring additional mitigation measures. *See Poet,* LLC, 12 Cal. App. 5th at 81.

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[3] Measures to reduce operational emissions from yard equipment were set to phase in as early as 2004 (MMAQ-15 and MMAQ-17). Port of Los Angeles, China Shipping FEIR, Transmittal 4: Berth 97-109 [China Shipping] Container Terminal Project Mitigation Measures, *available at* https://www.portoflosangeles.org/EIR/ChinaShipping/FEIR/_Mitigation_List.pdf ("FEIR Mitigation Measures"). The last measure to phase in is MMAA-20, which requires 100% LNG trucks by 2018. Port of Los Angeles, FEIR, Berth 97-109 [China Shipping] Container Terminal Project, Mitigation Monitoring and Reporting Program, at 2-13–2-20, *available at* https://www.portoflosangeles.org/EIR/ChinaShipping/FEIR/MMRP.pdf ("FEIR Mitigation Monitoring and Reporting Program").

ii. The RDSEIR fails to accurately account for past excess emissions

NRDC-8

Although the RDSEIR purports to provide an accounting for past excess emissions for informational purposes, its analysis is fundamentally flawed and vastly understates the emissions local communities were exposed to because of the Port's noncompliance with the required mitigation measures.

As an initial matter, the Port's evaluation of past emissions inexplicably evaluates only three years: 2012, 2014, and 2018.[4] However, the Port was in noncompliance with approved mitigation measures for many other years as well. *See* RDSEIR, Table 2-1. The Port must evaluate the impact of any noncompliance for *all* years, going back to 2000-2001, not just for 2012, 2014, and 2018. And the Port must then aggregate the amount of pollution shouldered by the local communities over those years, so that it can provide for mitigation to offset that total.

NRDC-9

In addition to leaving out many relevant years, RDSEIR's analysis suffers from another fundamental flaw. Even for the years the RDSEIR purports to analyze, it fails to make the correct comparisons. Rather than comparing what actually happened in past years to what *should have happened* under the 2008 EIR, the Port compares what actually happened in past years[5] to the "2008 Actual Baseline." RDSEIR, Table 3.1-9. This comparison to the 2008 Actual Baseline is perplexing and fails to provide the required information under CEQA.

The 2008 Actual Baseline, as defined by the Port, is the actual conditions in 2008 (and is identical to the required mitigation scenario in that year because the Port was supposedly in full compliance with required mitigation measures that year). RDSEIR at 2-28. Thus, the only year for which comparison to the 2008 Actual Baseline is relevant is the year 2008. For other years, the relevant comparison is what actually happened in that year to what *should have happened* in that year.

For example, for 2012, it makes no sense to compare the actual emissions in 2012 to the actual emissions in 2008. But that's precisely what the RDSEIR does. *See* RDSEIR, Table 3.1-9. Instead, the Port should compare what actually happened in 2012 to what was required to happen in 2012 under the approved mitigation measures. That would disclose the excess emissions for

[4] It is not entirely clear, but it appears that the Port based its evaluation of 2018 on predicted actual compliance with mitigation measures. *See* RDSEIR at 3.1-6 and Table 3.1-1. Because the Port remains in noncompliance today, it must include 2018 in any calculations setting forth past excess emissions.

[5] Although the RDSEIR lists these past years under "Revised Project," we understand the data provided for past years to be actual data from those years, not an estimate of what the emissions would be under a hypothetical Revised Project in those years *See, e.g.,* RDSEIR, Tables 3.1-9, 3.1-10, 3.1-11. The Port should clarify that this is the case, and fully disentangle the concepts of past actual compliance with the future Revised Project, which has not yet been approved. As it stands now, the Port conflates these two separate inquiries.

NRDC-9

that year. And although the Port contains an "FEIR Mitigated Scenario" showing what should have happened in each year if there had been full compliance, it compares that scenario—again, perplexingly—to the 2008 Actual Baseline. RDSEIR, Table 3.1-10. Returning to the example year of 2012, it is entirely unclear what a comparison of the 2012 FEIR Mitigated Scenario to the 2008 Actual Baseline is intended to show.

In short, the RDSEIR fails to make the correct comparisons. It compares past years' actual emissions to the 2008 Actual Baseline. It also compares past years' FEIR Mitigated Scenarios to the 2008 Actual Baseline. But it never directly compares past years' actual emissions to past years' FEIR Mitigated Scenarios; that is the comparison that would disclose how much additional pollution local communities suffered in those years due to the Port's noncompliance.

NRDC-10

The problems are similar for the Port's evaluation of toxic air contaminants and cancer risk. The RDSEIR uses both a "static" 2008 baseline and a "floating" 2008 future baseline, and then compares the Revised Project and the FEIR Mitigated Scenario to those 2008 baselines. RDSEIR at 3.1-29 to 3.1-30, 3.1-39 to 3.1-40, 3.1-68 to 3.1-73. Again, neither of those baselines provides a meaningful comparison. For the Port's evaluation of past toxic air contaminants exposure and cancer risk, it is unclear why the Port is using a 2008 baseline at all, except for comparison to what actually happened in 2008. Again, the Port should compare what should have happened in past years to what actually happened in those same past years. The RDSEIR fails to make that comparison and therefore fails to satisfy CEQA.

B. The Port must accurately account for and mitigate future excess emissions that would be caused by approval of the Revised Project

i. Under CEQA, the Port must disclose and mitigate the impacts of modified projects

NRDC-11

Under CEQA, agencies must disclose, analyze, and mitigate, where feasible, all new environmental impacts caused by changes in previously approved projects. Here, the Port must compare the Revised Project to the 2000-2001 baseline or, because the project was previously reviewed and approved in 2008, at the very least, to the levels of pollution that would have occurred under the previously approved project. *See, e.g., Am. Canyon Cmty. United for Responsible Growth v City of Am. Canyon*, 145 Cal. App. 4th 1062, 1073-81 (2006). The Port does not appear to contest that it must disclose and, where feasible, mitigate the excess future emissions that would be caused by the Revised Project.

ii. The RDSEIR fails to accurately account for future excess emissions

NRDC-12

Although the Port concedes that it must disclose the excess emissions that would be caused by approving the Revised Project, it fails to accurately analyze those emissions. The RDSEIR commits several errors in its analysis of future emissions under the Revised Project.

Most significantly, the RDSEIR makes the fundamental error of failing to compare the correct data for future excess emissions. As explained in our September 29, 2017 letter, the Port should compare the Revised Project to a 2000-2001 baseline because that represents the period before

NRDC-12

the project was constructed. If, however, the Port is unwilling to compare the Revised Project to a 2000-2001 baseline, at the very least it must compare the Revised Project to the baseline of the currently approved project (which the RDSEIR refers to as the "FEIR Mitigated Scenario"). Instead, the RDSEIR compares the Revised Project to the 2008 Actual Baseline. RDSEIR, Table 3.1-9. Again, the Port provides no compelling justification for using a 2008 Actual Baseline for these comparisons, given that not all mitigation measures had phased in by 2008. The Port's use of a 2008 baseline therefore obscures impacts. In other words, the RDSEIR compares both the Revised Project and the FEIR Mitigated Scenario to the 2008 Actual Baseline (RDSEIR, Tables 3.1-9, 3.1-10), but it never compares the Revised Project directly to the FEIR Mitigated Scenario.

NRDC-13

The problems are similar for the Port's evaluation of toxic air contaminants and cancer risk. The RDSEIR uses both a "static" 2008 baseline and a "floating" 2008 future baseline, and then compares those baselines to the Revised Project and the FEIR Mitigated Scenario. RDSEIR at 3.1-29 to 3.1-30, 3.1-39 to 3.1-40, 3.1-68 to 3.1-73. Again, neither of these baselines provides a meaningful information. As explained above, the static 2008 baseline fails to account for the increasingly stringent mitigation measures that were set to phase in over time. And the "floating" 2008 future baseline fails for similar reasons: It does not assume implementation of the mitigation measures as required by the 2008 EIR. Rather, it apparently "incorporates the effects of existing air quality regulations" over time. RDSEIR at 3.1-30. To the extent that the mitigation measures adopted in the 2008 EIR are more stringent than existing air quality measures, the use of the "floating" 2008 future baseline hides impacts. Nonetheless, even that baseline indicates that adopting the Revised Project will have a significant impact on individual cancer risk. *See* RDSEIR, Table 3.1-18. It is highly likely there would be additional significant impacts if the correct comparison were made. *See* RDSEIR, Tables 3.1-18, 3.1-19 (showing that the impacts are nearly significant when using the "floating" 2008 future baseline).

NRDC-14

The RDSEIR's analysis of the impacts of the Revised Project also contains other flaws. It bases its future air quality analysis on the fiction that new lease measures will go into effect in 2019. There is no basis to assume that this will occur because China Shipping has refused every past request by the Port to revise its lease—even after receiving millions of dollars in public funds from the Port, ostensibly to ease compliance with the terms of the Amended Stipulated Judgment. Without a 2019 lease amendment date, the future projected emissions will be higher than those predicted.

NRDC-15

In addition, the RDSEIR contains dubious assumptions about the future port drayage truck fleet and ocean-going vessels. For example, the Port assumes that NOx emissions have been and will be the same for diesel and LNG trucks, contradicting published data from CARB and U.C. Riverside showing lower NOx emissions from LNG trucks, especially with the newly-certified 0.02 g/hp/hr Cummins engine. Likewise, the RDSEIR assumes that after 2023, emissions from ocean-going vessels will be the same under the Revised Project and the approved project. The Port provides no explanation for this assumption.

NRDC-16

In sum, the RDSEIR's air quality analysis underreports future air emissions from the Revised Project. But even with this underreporting, the amounts of excess air pollution that Port

NRDC-16

neighbors have suffered and will continue to suffer are enormous. What CEQA demands now is a set of robust mitigation measures. Under no circumstances should the Port validate its past cheating by adopting a statement of overriding considerations and ignoring existing, feasible mitigation measures.

NRDC-17

C. Even using the incomplete data provided by the RDSEIR, it is clear that both past and future excess emissions are significant

At NRDC's direction, Sustainable Systems Research, LLC (SSR), quantified the past and future excess emissions (emissions reductions lost).[6] Specifically, using the data provided in Appendix B1, SSR calculated the past excess emissions caused by the Port's past noncompliance with the 2008 EIR mitigation measures and the future excess emissions that would result from the adoption of the Revised Project. As shown by Table 1 of the SSR report, by any measure, those emissions are significant:

Table 1: Total Tons of Excess Emissions for the period from 2009 to 2045

	NO_X	VOC	CO	PM2.5	PM10	SO_X	DPM
Through the Present: 2009 to 2018							
Trucks	-	-	-	-	-	-	8
OGV	191	4	18	4	4	13	4
CHE	588	77	1016	7	7	0	5
TOTAL	**778**	**82**	**1034**	**11**	**12**	**12**	**18**
Future Years: 2019 to 2045							
Trucks	-	-	-	-	-	-	24
OGV	283	11	33	7	8	13	8
CHE	339	99	2556	2	1	0	4
TOTAL	**621**	**110**	**2589**	**9**	**8**	**13**	**36**
All Years: 2009 to 2045							
Trucks	-	-	-	-	-	-	33
OGV	474	15	51	11	12	25	12
CHE	926	177	3572	8	8	0	9
TOTAL	**1400**	**192**	**3623**	**19**	**20**	**25**	**54**
Share Emitted by 2018	**56%**	**42%**	**29%**	**55%**	**58%**	**49%**	**33%**

[6] *See* Report from Dana Rowangould, Sustainable Systems Research, LLC, "China Shipping Container Terminal: Excess Emissions from Modified FEIR Mitigations" (Nov. 14, 2018), included as Attachment K1.

NRDC-17

SSR then illustrated the impact of those excess emissions by comparing them to equivalent emissions from coal-fired power plants, millions of truck miles traveled, or other similar figures:

- The excess NO_X emissions from 2009 through 2045 are equivalent to a typical coal-fired power plant operating for approximately 11 months.
- The excess NO_X, VOC, CO, PM2.5, PM10, SO_X, and DPM that will be emitted from 2009 through 2045 are the equivalent of:
  - 210; 700; 2,400; 140; 96; 1,500; and 520 million truck miles traveled in 2018, respectively;
  - Emissions from 56,000; 180,000; 480,000; 32,000; 21,000; 400,000; and 110,000 trucks traveling for the entire period from 2009 to 2045, respectively; or
  - 59%, 200%, 490%, 35%, 22%, 390%, and 140% of all heavy duty truck emissions occurring within the SCAB region for the entire period from 2009 to 2045, respectively.

These figures—as massive as they are—still undercount the excess emissions. Because the Port did not provide data for years before 2008, SSR could not evaluate those years. So, to the extent that there was any noncompliance in earlier years, those excess emissions are not reflected here. The analysis may also undercount excess emissions because SSR based its analysis on data provided in the RDSEIR, which—as noted above—improperly assumes that LNG trucks and diesel trucks have equivalent emissions for all pollutants except diesel particulate matter, and that future ship emissions will be the same under the Revised Project and approved project scenarios. The RDSEIR also wrongly uses EMFAC emission factors for the port drayage duty cycle, which UCR showed are way off.

NRDC-18

In sum, the SSR report confirms that the excess emissions—both from the Port's cheating in the past and from the proposed Revised Project—are significant. These air pollutants will cause serious health effects, especially for children, pregnant women, and the elderly. VOCs react with NOx to form ozone, the main ingredient in "smog." Ozone can trigger chest pain, coughing, throat irritation, and airway inflammation. Over the long term, ozone pollution can harm lung tissue and worsen bronchitis, emphysema, and asthma. Sulfur dioxide emissions can exacerbate asthma, and studies have shown a connection between short-term exposure and increased hospital visits and admissions. Sulfur dioxide can also react with other compounds to form tiny particles that penetrate deep into the lungs, and that can cause emphysema, bronchitis, and heart disease. And particulate matter can aggravate asthma and cause increased respiratory symptoms, such as irritation of the airways, coughing, and difficulty breathing. Particulate matter has even been shown to cause heart attacks, cancer, and premature death. Communities near the Port, and especially low-income communities of color, were and continue to be exposed to a higher risk for these illnesses because of the project's excess emissions.

The SSR report shows that the RDSEIR's analysis of air quality impacts is patently insufficient. The past and future excess emissions are far more significant than the Port is willing to admit, and require additional mitigation measures, as discussed below.

D. The RDSEIR fails to analyze whether the Revised Project will conflict with or obstruct implementation of the 2016 AQMP

NRDC-19

The South Coast air basin is classified under the federal Clean Air Act as in "extreme non-attainment" for ozone, better known to residents of the area as smog.[7] The main precursors of ozone in the lower atmosphere are NOx and VOCs. In its 2016 Air Quality Management Plan (AQMP), the South Coast Air Quality Management District (AQMD) attempts to demonstrate to the U.S. Environmental Protection Agency (US EPA) how it intends to come into compliance by 2023, focusing on enormous reductions in NOx emissions in the region:

> The most significant air quality challenge in the Basin is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total Basin NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions ("baseline emissions"). The analysis suggests that total Basin emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.[8]

As we pointed out in our earlier letter, this is an enormous challenge. The AQMP relies heavily on reducing NOx emissions from the main sources of NOx in the area: mobile sources, mostly heavy-duty trucks, that cause 88% of the NOx emissions regionally.[9] Given the projected increase in port throughput estimated in the RDSEIR, and the absence of the low-NOx LNG trucks that the Port promised to serve China Shipping, the Revised Project will make compliance with the 2016 AQMD even harder. We also note that the Port has been resistant to a proposal from South Coast concerning an indirect source rule, another way to reduce NOx emissions.

II. The RDSEIR fails to overcome the presumption that the 2008 mitigation measures are feasible, and fails to set forth all feasible measures to reduce significant operational emissions

NRDC-20

Of the 52 mitigation measures adopted in the 2008 EIR, ten mitigation measures and one lease measure have not been fully implemented. RDSEIR at Table 2-1. Of the unimplemented

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[7] South Coast Air Quality Management District, 2016 Air Quality Management Plan, Executive Summary, *available at* http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/executive-summary.pdf?sfvrsn=4 (Attachment E12). This is with reference to the 75 ppb federal NAAQS, which has since been lowered to 70 ppb.

[8] *Id.* at ES-2.

[9] *Id.* at ES-7; *see also id.* at 4-7 and Fig. 4-1.

NRDC-20

measures, 7 apply to operational emissions. The RDSEIR seeks to modify or eliminate these air quality measures.

Under CEQA, a lead agency may not approve a project that will have significant environmental impacts unless it finds that alternatives and mitigation measures to reduce environmental impacts are infeasible based on specific economic, legal, social, technological or other considerations. Cal. Pub. Res. Code §§ 21002; 21061.1. "'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors." *Id*. § 21061.1.

An agency may delete or modify a mitigation measure after an initial EIR is certified, but must state a legitimate reason for deleting the mitigation measure, supported by substantial evidence. *Napa Citizens for Honest Gov't v. Napa Cty. Bd. of Supervisors*, 91 Cal. App. 4th 342, 359 (2001), as modified (Aug. 7, 2001), as modified on denial of reh'g (Sept. 4, 2001). Courts will temper deference to agency decisions to delete a mitigation measure with the presumption that the mitigation measure was adopted only after "due investigation and consideration" in the initial environmental review process. *Id.* "The fact that a mitigation measure had been adopted in an earlier plan, but has been deleted, will be relevant to the question of the adequacy of the modified EIR, because it identifies a mitigation measure that the modified EIR then must address." *Id.* A mitigation measure "cannot be deleted without a showing that it is infeasible." *Id.* Finally, "the deletion of an earlier adopted measure should be considered in reviewing any conclusion that the benefits of a project outweigh its unmitigated impact on the environment." *Id.*[10] The RDSEIR fails to overcome this presumption.

Our comments in this section and the next are organized as follows: First we provide a summary of the factual record that undercuts the RDSEIR's claims that the 2008 mitigation measures are not feasible. Second, we highlight text in the RDSEIR, which seems to confirm that the 2008 mitigations are in fact feasible. Third, we explain how each of the original mitigations are feasible, and can be strengthened, as well as provide specific comments on the revised measures. Finally, we list additional measures the Revised Project should include to mitigate the project's significant operational emissions, including the excess emissions attributable to the Port's noncompliance.

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[10] *Napa Citizens* was decided in the context of a land use plan, and has since been applied to all CEQA projects. *See Lincoln Place Tenants Ass'n v. City of L.A.*, 130 Cal. App. 4th 1491, 1509 (2005); *see also Katzeff v. Cal. Dep't of Forestry and Fire Prot.*, 181 Cal. App. 4th 601, 614 (2010).

A. The Port's infeasibility arguments are a litigation artifact and not supported by the record

NRDC-21

Correspondence obtained through Public Records Act requests shows a frustrated Port and City Attorney disbelieving China Shipping's unsupported assertions that the 2008 mitigation measures were infeasible and demanding specifics, without success.

On February 17, 2015, the City Attorney wrote to counsel for China Shipping summarizing years of negotiations and specifically stating that China Shipping was "required to immediately implement" the mitigation measures identified in the 2008 EIR.[11] The City Attorney's letter contained a blunt threat:

> In the event a third party files a legal action challenging China Shipping's failure to comply with the mitigation measures, there is a strong possibility that the court will issue an order enjoining or otherwise affecting China Shipping's operations. Under California law, a court has broad authority to stop activities that it determines are against the law, are detrimental to the environment or violate a court order. These remedies are separate from and are not related to any rights or agreements between the Port and China Shipping. *The Court can issue any of these orders, including the complete shut-down of all activities at the site, without regard to the provisions of the Permit No. 999*. [Emphasis added]

On February 25, 2015, China Shipping replied and claimed it was fully compliant with the mitigation measures for ships, including the AMP and VSR measures. The letter went on to provide brief unsupported assertions that "immediate" replacement of certain cargo handling equipment was not economically feasible "at this time," and generally asserted that the LNG truck measure was not economically feasible.[12]

On March 3, 2015, the City Attorney replied to the China Shipping letter[13] and pointed out that the claim of infeasibility was late in the game:

> On the overall issue of economic infeasibility, China Shipping had the opportunity to present comments and evidence of economic infeasibility of these [mitigation] measures during the environmental review process, but chose not to do so.

Nonetheless the City Attorney invited China Shipping (again) to provide information regarding infeasibility on economic grounds or otherwise if circumstances had changed. On March 25, 2015, China Shipping replied, again, with few specifics.[14] Perhaps tiring of this, on April 16,

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[11] Attachment A30.
[12] Attachment A31.
[13] Attachment A32.
[14] Attachment A33.

2015,[15] June 12, 2015,[16] and October 19, 2016,[17] the City Attorney and Port wrote to China Shipping asking for more information.

On December 30, 2016, China Shipping wrote to the City Attorney and claimed that it needed more time to respond.[18] By that point, the September 18, 2015 NOP in this matter had been on the street for over a year. On January 17, 2017, the Port Executive Director Eugene Seroka again wrote to China Shipping[19] stating that:

> With respect to the SEIR, POLA has made several requests for data and information from China Shipping to assist POLA in preparation of the SEIR. To date, POLA has received only partial responses from China Shipping . . . China Shipping has not proposed any modifications to make currently required mitigation measures feasible nor provided alternative measures that could address the identified environmental impacts. This response is not satisfactory.

NRDC-21

Mr. Seroka went on to say that the Port was proposing certain changes to the mitigation measures for analysis in the SEIR, and that:

> [I]t is incumbent on China Shipping, as the tenant, to comment on the feasibility of the measures proposed. Failure to do so is solely the responsibility of China Shipping.

On January 25, 2017, China Shipping responded that it would address the SEIR and environmental matters "in the near future."[20] Based on the documents received in response to our Public Records Act Requests to the City of Los Angeles, we do not believe China Shipping ever provided Mr. Seroka with additional information demonstrating potential infeasibility. China Shipping also did not appear to have commented on the NOP for the DSEIR.[21]

These facts show a lack of substantial evidence demonstrating infeasibility, and cast the Revised Project as an attempt to rationalize the Port and China Shipping's noncompliance.

Below, in sections B though H, we further document how the 2008 mitigation measures are in fact, feasible.

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[15] Attachment A35.
[16] Attachment A62.
[17] Attachment A67 (POLA001634–35).
[18] Attachment A63 (POLA001471–74).
[19] Attachment A63 at POLA001475–81.
[20] Attachment A65 at POLA001587.
[21] DSEIR, Table 1-3 ("Summary of Key NOP Comments").

B. The RDSEIR implies that the 2008 mitigation measures are feasible by stating that if the Revised Project is rejected, the original 2008 mitigation measures will be enforced

When explaining the discretionary decision before the Board, the RDSEIR states:

> Putting aside the feasibility issues raised about these mitigation measures, if the Board does not approve the Revised Project, the original mitigation measures for air quality and greenhouse gas emissions would remain applicable to the CS Container Terminal. . . . LAHD would continue to be responsible for overseeing the Mitigation Monitoring and Reporting Program and ensuring all parties comply with the mitigation measures.

NRDC-22

RDSEIR at 1-36 to 1-37. The RDSEIR goes on to state that if the Board rejects the Revised Project, the Port would be responsible for enforcing the previously adopted measures in a separate proceeding. RDSEIR at 1-37.

Such statements at best confuse and at worst run counter to the RDSEIR's position that the unfulfilled measures adopted in 2008 are infeasible. Either the measures are infeasible, and cannot be implemented or enforced; or the measures are feasible, and the Board of Harbor Commissioners can move forward with the Project as envisioned in 2008 by implementing and enforcing all 52 mitigation measures certified in the China Shipping EIR.[22]

C. The 2008 AMP measure (MM AQ-9) is feasible

The RDSEIR does not overcome the presumption that the 2008 EIR's AMP measure (MM AQ-9) is feasible, and thus goes backwards for no legally valid reason. **The Port should maintain a 100% compliance rate with the Port's AMP requirement as envisioned in the 2008 EIR, and if necessary, allow vessel operators to comply with an alternative emissions control system.**

NRDC-23

In the 2008 FEIR, MM AQ-9 required that China Shipping ships calling at Berths 97-109 use AMP in the following percentages while hoteling in the Port.

- Jan–Jun 2005: 60%
- July 2005: 70%
- Jan 2010: 90%
- Jan 2011: 100%.

[22] We understand that if the 2008 measures are deemed technologically and operationally feasible (e.g., 100% ships can use AMP and comply with VSR), some of the deadlines for the measures have past, and would still need to be re-set.

MM AQ-9 also required that by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at a 100% compliance rate, except for circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship.[23]

The RDSEIR's revised measure reduces the percentage of vessel calls that must comply with AMP to 95%, and provides that if one or more of several exceptions exist, vessel operators can utilize an equivalent alternative at-berth emissions control caption system if feasible in lieu of AMP. RDSEIR at 2-15.

None of the reasons cited in the RDSEIR overcome the presumption that a 100% compliance rate with AMP is feasible (we acknowledge, of course that the deadline for that compliance—2011—is no longer feasible). The explanation provided is not based on data from China Shipping or its successors that the 100% AMP requirement is infeasible for its vessel operations, and instead appears to be speculative, generalized, and provided by the Port.

NRDC-23

As detailed in our September 29, 2017 comment letter, the Port privately granted waivers to China Shipping from the Project's AMP requirements (MM-AQ 9)—including when it served its financial interests to do so,[24] never secured an amended lease with China Shipping that included the 2008 mitigation measures, RDSEIR at 1-11, and took no action against China Shipping to enforce the mitigation measures even as deadlines came and went. It appears that measures like MMAQ-9 became "infeasible" due to the own Port's failure to timely implement and enforce them, not due to any economic, legal, social, or technological reasons. *See* CEQA Guidelines § 15091.

Further, the RDSEIR's claim that the 100% AMP requirement should be relaxed to 95% is contrary to other port projects. For example, Middle Harbor at the Port of Long Beach has had a 100% AMP requirement since December 2014.[25] And 100% of vessel calls at the Port's Trapac

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[23] FEIR Mitigation Monitoring and Reporting Program at 2-13.

[24] *See* Attachment A13 (POLA000633–34); Attachment A23 (POLA000822–23); Attachment A25 (POLA00825–26); Attachment A61 at POLA001429–30; Attachment A62 at POLA001462 (documents detailing at least five waivers granted by the Port to China Shipping from the shore-power requirements). One of the waivers was granted after China Shipping told the Port in late November 2011, that it entered a deal that would shift 800 TEUs weekly from Long Beach to Los Angeles, and to meet the volume increase, it would need to use larger vessels that were not AMP-equipped (the smaller vessels China Shipping was using at the time were AMP-equipped). The Port granted China Shipping a waiver from the AMP requirement about two weeks later. Email from Z. Bing to K. McDermott (Nov. 25, 2011) (Attachment A69 (POLA001727)); Email from K. McDermott to Z. Bing (Dec. 12, 2011) (Attachment A69 (POLA001742)).

[25] Middle Harbor FEIR at ES-32 (Table ES 8-1) (April 2009) (Attachment C12) ("Mitigation Measure AQ-5: Shore-to-Ship Power ("Cold Ironing"). All OGV that call at the Middle Harbor container terminal shall utilize shore-to-ship power while at berth according to the following schedule: (1) 33 percent of all OGV by December 2009 (2) 66 percent of all OGV by March 2012, and (3) 100 percent of all OGV by December 2014. Lease stipulations shall include

terminal are set to use AMP starting January 2018, per the certified Final EIR/EIS for that project.[26] The RDSEIR does not explain why a 100% AMP requirement is *in*feasible at the China Shipping terminal when shipping lines have been—and are increasingly planning to—comply with the same requirement at the Port of Los Angeles and the Port of Long Beach.

Further, the RDSEIR notes that the California Air Resources Board has directed its staff to amend the State's At-Berth Regulation to achieve 100% compliance by all vessels by 2030, and that the Port committed in its 2017 CAAP "to participate in the State's efforts to achieve 100% compliance with CARB's regulation." RDSEIR at 2-14. There is an obvious disconnect between the Port's commitment to align its efforts with CARB's amended At-Berth Regulation, and its claims that a 100% AMP requirement is infeasible.

Regardless, even if the 100% AMP requirement is somehow infeasible, the Revised Measure must be strengthened to meet the Port's CEQA obligation to adopt all feasible mitigation measures. Specifically, the Port should require that 100% of ships at dock are mitigating at-berth emissions with either shore power *or* an alternative emissions control system. Limited exceptions could be granted for emergencies.

This recommendation is supported by recent comments submitted by the State of California on the Port's Everport project. In its comments, CARB urged the Port to require a 100 percent shore power compliance rate from vessels equipped with short power, and alternative capture and control systems for all ships that are not equipped to use shore-based electricity.[27]

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consideration of alternative technologies that achieve 90 percent of the emission reductions of cold-ironing.").

[26] Mitigation Measures: Berth 136-147 [TraPac] Container Terminal Project EIR (FEIR Mitigation List) at 4, *available at* https://www.portoflosangeles.org/EIR/TraPac/FEIR/FEIR_Mitigation_List.pdf (Attachment C14) ("MM AQ-6: AMP. Ships calling at Berth 136-147 shall use AMP while hoteling at the Port in the following at minimum percentages: (a) 2009: 25% of ship calls; (b) 2010: 50% of ship calls; (c) 2012: 60% of ship calls; (d) 2015: 80% of ship calls; and (e) 2018: 100% of ship calls. Additionally, by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at 100 percent compliance rate, with the exception of circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship.").

[27] Letter from E. Yura, CARB, Chief, Emissions Assessment Branch Transportation and Toxics Division, to C. Cannon, City of Los Angeles Harbor Department and T. Stevens, U.S. Army Corps of Engineers (June 5, 2017) (commenting on the Everport Container Terminal Project Draft EIR) (Attachment E6). CARB's push for a 100% compliance rate is consistent with its March 2017 resolution wherein it directed its staff to "within 18 months. . . develop At-Berth regulation amendments that achieve up to 100% compliance by 2030 for LA Ports." CARB, Resolution 17-7, 2016 State Strategy for the State Implementation Plan (March 23, 2017), available at https://www.arb.ca.gov/planning/sip/2016sip/res17-7.pdf (Attachment G1); *see also* Attachments D1-D2, G4 (CARB certification of at berth alternative control systems).

NRDC-23

Finally, the RDSEIR claims that "[t]he Port does not have the authority to impose any specific emissions reduction technology on OGVs as they are internationally flagged vessels subject only to IMO regulations." RDSEIR at 3.1-54. This is an inaccurate statement of the law given the Port's authority as a landlord to impose lease conditions on its tenants, including China Shipping, and is contrary to the authority the Port proposes to assert under its revised measures for ships.

Given the number of vessels that are anticipated to visit the terminal, the length of time these larger vessels will be docked for offloading, and the amount of emissions released while vessels are at berth, requiring 100% of vessels to mitigate at-berth emissions would meaningfully reduce operational emissions.

D. The 2008 VSR measure (MM AQ-10) is feasible

NRDC-24

The Port should maintain a 100% compliance rate with the Port's vessel speed reduction program, as envisioned in the 2008 EIR.

The 2008 EIR, MM AQ-10, required that starting in 2009, 100% of ocean going vessels calling at the China Shipping Container Terminal comply with the Port's VSR program within a 40 nm radius of Port Fermin.[28] The RDSEIR purports that a 100% compliance rate is infeasible, and proposes to revise the measure to require 95% compliance starting on the effective date of a new lease amendment between LAHD and the tenant.

The RDSEIR asserts that vessels cannot achieve a 100% compliance rate because of pressure on vessel schedules caused by weather, port delays, and mechanical problems, and the need to maintain economic competitiveness. RDSEIR at 2-16, 2-17. These reasons, however, are generically asserted. The RDSEIR does not point to any data or statements from China Shipping validating the Port's infeasibility claims, or analysis finding that the original VSR requirements would render China Shipping's operations economically impracticable. Further, nothing has changed since 2008 that would have rendered the VSR measure feasible in 2008 and infeasible now.

Moreover, the Port's own data and data from its neighbor, the Port of Long Beach, demonstrate that a 100% compliance rate is achievable. For example, the Port's website indicates the China Shipping Terminal was 100% complaint with the Ports VSR program at both 20 nm and 40 nm in 2016.[29] In 2017, three shipping lines (Chevron USA Marine Branch, Evergreen Marine Corp.,

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[28] FEIR Mitigation Monitoring and Reporting Program at 2-13.

[29] Port of Los Angeles, Vessel Speed Reduction Compliance (2016), *available at* https://www.portoflosangeles.org/environment/progress/wp-content/uploads/2017/01/VSR-Graphic-1-4-2017-2.pdf (Attachment C6).

and MSC Mediterranean Shipping Co.) were 100% compliant with the Port's VSR program at 40 nm.[30] Data on China Shipping's compliance in 2017 were not available on the Port's website.

Data from the Port of Long Beach, which also operates a VSR program, demonstrates that in 2016, 113 vessel operators achieved 100% compliance with Long Beach's VSR program within the 40 nm zone.[31] One of these vessel operators was China Shipping Container Lines, while another was Yang Ming (one of the shipping lines that uses China Shipping's terminal). RDSEIR at 2-14. In 2017, 115 vessels operators achieved 100% compliance with Long Beach's VSR program within the 40 nm zone.[32] Again, China Shipping[33] and Yang Ming were among the operators who achieved 100% compliance.

The Port of Long Beach has also certified environmental impact reports requiring 100% compliance with VSR. The Middle Harbor project required 100% compliance by 2014.[34] And

NRDC-24

[30] Port of Los Angeles, Vessel Speed Reduction Compliance (2017 YTD), *available at* https://www.portoflosangeles.org/environment/progress/wp-content/uploads/2017/08/vsr-graphic-8-22-2017.pdf (Attachment C18).
[31] Port of Long Beach, Green Flag Incentive Program Operator Compliance Monthly Report (1/1/2016–12/31/2016), *available at* http://www.polb.com/civica/filebank/blobdload.asp?BlobID=13769 (Attachment C7). Long Beach has a voluntary, incentive based program that rewards vessel operators for slowing down to 12 knots or less within 40 nautical miles (nm) of Point Fermin. Port of Long Beach, Green Flag Incentive Program, *available at* http://polb.com/environment/air/greenflag.asp (Attachment C8). In some instances, however, such as for tenants at the Port of Long Beach's Middle Harbor property, VSR is a mandatory lease requirement. Given that the VSR programs at both ports are largely a voluntary incentive based program, operators can elect not to participate in the program. Thus, the number of vessel operators cited as in 100% compliance with the program at the Port of Long Beach could be higher if the VSR requirements were mandatory.
[32] Port of Long Beach, Green Flag Incentive Program Operator Compliance Monthly Report (1/1/2017–12/31/2017), *available at* http://www.polb.com/civica/filebank/blobdload.asp?BlobID=14364 (Attachment C19).
[33] China Shipping is listed within the Port of Long Beach's Operator Compliance Monthly Report (1/1/2017 – 12/31/2017) as "COSCON," which is the name the COSCO Shipping Lines formerly traded under. https://www.coscon.co.uk/. In February 2016, the China Ocean Shipping Group Company, or COSCO, and China Shipping Group merged to create the COSCO shipping line. RSEIR at 1-11.
[34] Port of Long Beach Middle Harbor FEIR, Table ES.8-1, *available at* http://polb.com/civica/filebank/blobdload.asp?BlobID=6227(Attachment C12) ("Mitigation Measure AQ-4: Expanded VSRP. All OGV that call at the Middle Harbor container terminal shall comply with the expanded VSRP of 12 knots from 40 nm from Point Fermin to the Precautionary Area.").

the tenant at Middle Harbor, Orient Overseas Container Lines (OOCL), had a 100% compliance rate with VSR in 2016.[35]

NRDC-24

Recent comments by the State of California on the Port of Los Angeles' Everport DEIR/DEIS also indicate that the Port should adopt a VSR measure that requires compliance beyond 95%.[36] In CARB's comments, the agency noted that the terminal's vessels were already meeting an above 95% compliance rate in recent years, and thus, the Port should propose further mitigation to achieve additional emissions benefits.[37] Similarly, vessels serving the China Shipping Container Terminal at the Port of LA had a 96%-98% compliance rate within 40 nm in 2014 through 2016. RDSEIR, Table 2-1.[38] Accordingly, actual operations at the China Shipping terminal demonstrate that the revised measure's 95% compliance rate can be strengthened to comply with CEQA.

For the above reasons, the RDSEIR fails to overcome the presumption that a 100% compliance rate for VSR is feasible, and has not demonstrated that a 95% compliance rate satisfies the Port's obligation to adopt all feasible mitigation measures.

NRDC-25

Finally, the revised VSR measure envisions that a vessel operator shall either comply with VSR 95% of the time, or "comply with an alternative compliance plan approved by the LAHD for a specific vessel and type." RDSEIR at 2-17. The Revised Measure goes on to state that the alternative compliance plan shall demonstrate that it will "achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP." *Id*. In theory, we support providing compliance options to vessel operators that can achieve equivalent emissions reductions. The RDSEIR, however, does not provide any details on what might be included in the alternative compliance plan. Thus, there is no way for the public to provide input on whether those alternative measures are equivalent to VSR in terms of emissions reductions, or if they have unintended impacts, such as increasing the likelihood of whale strikes. The RDSEIR must include such information.

E. The cargo handling equipment measures (MM AQ-15, AQ-16, AQ-17) are feasible, and can be strengthened to require utilizing zero emission technologies

NRDC-26

The RDSEIR does not overcome the presumption that the 2008 EIR mitigation measures for cargo handling equipment are feasible, and weakens the measures without providing a legally valid reason for doing so. The RDSEIR also fails to consider the full range of feasible mitigation

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[35] Port of Long Beach, Green Flag Incentive Program Operator Compliance Monthly Report, 1/1/2016–12/31/2016, *available at* http://www.polb.com/civica/filebank/blobdload.asp?BlobID=13769 (Attachment C7).
[36] Letter from E. Yura, CARB, Emissions Assessment Branch Chief, Transportation and Toxics Division, to C. Cannon, City of Los Angeles Harbor Department and T. Stevens, U.S. Army Corps of Engineers at 5 (June 5, 2017) (Attachment E6).
[37] *Id.*
[38] *See also supra* Port of Los Angeles, Vessel Speed Reduction Compliance at note 29.

measures for its revised cargo handling equipment mitigation measures. **In general, the cargo handling equipment mitigation measures should be revised to require accelerated deployment of zero emission cargo handling equipment, achieving 100% zero emission cargo handling equipment by 2030 at the latest.** These comments address the mitigation measures for each category of cargo handling equipment in turn.

NRDC-26

Local and state entities have sent clear signals to the ports that zero emission cargo handling equipment technologies must be implemented in the near term. The Mayors of Los Angeles and Long Beach issued an executive directive in June 2017, setting a goal that the ports fully implement all (100%) zero emission cargo handling equipment by 2030. CARB also adopted a resolution in March 2017 directing staff to develop regulations for cargo handling equipment to achieve up to 100% zero emissions by 2030.[39] These commitments are further embraced by the ports Final CAAP Update 2017.[40]

First, as explained in detail in these comments, the mitigation measures for cargo handling equipment set forth in the 2008 EIR are feasible. Second, and in accordance with CEQA's mandate to consider all feasible mitigation measures, the RDSEIR can and should incorporate enhanced mitigation measures that will achieve the zero emission future envisioned by the Mayors, San Pedro Bay Ports, and CARB. The project should include a mitigation measure that requires all zero emission cargo handling equipment by 2030, and should deploy zero emission equipment much more rapidly where it is feasible to do so. The Revised Project should also contain a strong plan to develop the electric infrastructure necessary to support zero emission technology. Finally, the project should be revised to implement additional zero emission technology demonstration projects. [41]

NRDC-27

Many types of zero emission cargo handling equipment are commercially available and currently operating in several terminals at the Ports of Los Angeles and Long Beach. In November 2017, there were already 333 pieces of zero emission cargo handling equipment operating at the Ports

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[39] CARB, Resolution 17-7, 2016 State Strategy for the State Implementation Plan (March 23, 2017), *available at* https://www.arb.ca.gov/planning/sip/2016sip/res17-7.pdf (Attachment G1).
[40] Final CAAP Update 2017 at 4-5, 51-52 (Attachment C20).
[41] In numerous documents, the Port has emphasized the critical importance of technology demonstrations as a step to emissions reductions. *See e.g.*, 2017 Final CAAP Update at 51 ("To get to zero emissions it will be necessary to identify, demonstrate, and deploy technologies in port operations . . . "). To the extent that certain types of zero emission terminal equipment are not yet commercially available or proven in widescale deployment, the Port should require near-term demonstration projects for those pieces of technology, requiring replacement with zero emission technologies contingent on the success of those projects. Or, the measures could tier from demonstration projects that are currently happening at other terminals, and require replacement of equipment with zero emission technologies once those projects are completed successfully.

of Los Angeles and Long Beach, with an anticipated 519 pieces of equipment in 2020 and 573 in 2025.[42]

NRDC-27

Specifically, zero emission cargo handling equipment used at the Trapac and Middle Harbor terminals demonstrates that in addition to reducing diesel emissions and greenhouse gases, replacing diesel fueled cargo handling equipment with high density automated electrified equipment can result in significant efficiency gains.[43] This has been shown to lead to cost savings, allows terminals to handle increased cargo volumes, and results in lowered truck turn times.[44] Our understanding is that the Trapac terminal has maintained the same level of jobs with electrification and automation. With that said, we strongly encourage that efforts to automate terminals be coupled with workforce development and training so that workers can transition to new jobs to support the new technologies. In short, zero emission cargo handling equipment is not only technologically feasible, it also increases efficiencies and profits, and is compatible with job retention.

Thus, as a first step, the RDSEIR should study the terminal operations at Trapac and Middle Harbor, account for the types of equipment utilized at those terminals (which we understand is nearly 100% electric) and set forth similar measures for this project.

i. The 2008 electric rubber-tired gantry crane measure (MM AQ-17) is feasible

NRDC-28

The 2008 EIR MM AQ-17 required that all rubber-tired gantry cranes shall be electric by January 1, 2009. Today, nine years past the deadline, none of the rubber-tired gantry cranes (RTGs) are fully electric.[45] The RDSEIR requires only four electric RTG cranes to be installed seven years after the effective date of the new lease amendment between LAHD and the tenant, and that diesel-electric hybrids replace the rest of the RTG cranes.[46] As discussed below, the DSEIR does not overcome the presumption that the 2008 EIR's electric RTG measure is

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[42] Final CAAP Update 2017 at 58 (Table 4).
[43] Electrification of cargo handling equipment does not necessarily require automation.
[44] JOC.com, "LA-LB terminals, carriers try to ensure ports' green plan doable," *available at* https://www.joc.com/port-news/us-ports/la-lb-terminals-carriers-try-ensure-ports-green-plan-economically-feasible_20170309.html (Attachment H4); JOC.com, "Automation halves truck turn times at Long Beach port terminal," *available at* https://www.joc.com/port-news/us-ports/port-long-beach/automation-halves-truck-turns-times-long-beach-port-terminal_20160531.html (Attachment H5).
[45] RDSEIR at 2-4 (Table 2-1).
[46] RDSEIR at 2-20 – 2-21. It is unclear how many pieces of cargo handling equipment currently operate at the terminal, including RTG cranes. The DSEIR provided some information on this within, DSEIR Table 2-5 (Cargo-handling equipment inventory of West Basin Container Terminal), which appears to have been removed from the RDSEIR.

feasible. **The Port should maintain the requirement to replace all RTGs with fully electric, zero emission RTGs.**

NRDC-28

The RDSEIR does not offer sufficient evidence to explain why the original mitigation measure for RTGs was never implemented. To the contrary, the Port admits that it is feasible to install at least four additional electric RTGs today; the RDSEIR states that the infrastructure currently exists to support four electric RTGs in the "surcharge area."[47] The Port fails to explain why it has delayed installing these four electric RTGs in the surcharge area, despite acknowledging that this installation was clearly feasible. According to a draft evaluation of compliance status updated in September 2014, the WBCT had plans to replace existing diesel-powered RTGs with five electric RTGs and five hybrids by the end of 2014.[48] The Port does not acknowledge these plans in the RDSEIR nor do they explain why these plans were abandoned.

Further, it appears that following certification of the 2008 Final EIR, the terminal purchased a number of new, non-compliant cranes, purchasing at least two new non-compliant diesel cranes with model years 2011 and 2013,[49] and putting a 2015 model year hybrid crane into service in 2015.[50, 51] The Port must explain why noncompliant new diesel cranes were purchased instead of electric cranes, in flagrant violation of the 2008 Final EIR.

Moreover, to the extent that these newer, noncompliant purchases increase the costs of electrification today (because they would require replacing the cranes before the end of their useful life), the Port may not use the additional costs incurred to argue infeasibility.[52] In addition, the record shows that the Port paid China Shipping at least $22 million to offset the costs of complying with the ASJ.[53] Any cost estimates from China Shipping related to complying with air quality mitigation measures or claims of competitive disadvantage should take these contributions into account.

The Port also does not provide any evidence to support its vague statements that terminal configuration, costs, and space constraints make the measure infeasible. In addition, the Port fails

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[47] RDSEIR at 2-19, 3.1-54.
[48] Draft Evaluation of Compliance Status and Compliance Cost for Mitigation Measures for China Shipping Terminal (Nov. 20, 2013, revised Sept. 29, 2014) (Attachment A21 at POLA000812-13).
[49] DSEIR at 2-17, Table 2-5.
[50] Attachment A209 (ChinaShippingCPRA 611); Attachment A210 (ChinaShippingCPRA 613).
[51] DSEIR at 2-17, Table 2-5. Again, this table does not appear in the RDSEIR.
[52] The same argument should apply to all noncompliant equipment purchased after the 2008 Final EIR. For instance, DSEIR Table 2-5, which does not appear to be reproduced in the RDSEIR, shows 92 pieces of cargo handling equipment with model years between 2008 to 2014 in operation at the West Basin Container Terminal between about 2000 to 2014.
[53] Attachment A68 at POLA001715 (describing $22 million contribution to China Shipping); Attachment A68 at POLA001722 (describing multi-million dollar payments to China Shipping to cover the costs of e.g., yard tractors and rubber tired gantries).

to explain what makes implementation of electric RTGs infeasible *now* as compared to when the final EIR was certified in 2008. Was the terminal previously configured in a way that could have accommodated all-electric RTG cranes? Could the terminal have been developed in a way to make the configuration work differently or to provide the infrastructure to support electrification? How much did delay in implementation contribute to today's cost estimates of compliance? The Port must answer these questions to overcome the presumption that the requirement to install all-electric RTG cranes was, and still is, feasible.

NRDC-28

The presumption that installing all-electric RTG cranes is feasible is bolstered by a plethora of evidence that electric RTGs are commercially available and relatively inexpensive substitutes for diesel. The Long Beach Container Terminal has installed and initiated full-scale operation of electric RTGs. CARB also recognizes that electric rubber-tired gantry cranes are a "commercially available, mature technology for container handling."[54] There are at least five commercially available grid electric RTG models, and at least five commercially available grid electric retrofits.[55] Electric RTGs have been in-use at foreign ports since 2002, and are currently in-use at domestic ports.[56] To give one example, the Port of Long Beach is repowering nine rubber-tired gantry cranes to full electric power.[57]

Electric RTGs are not only commercially available, they are also relatively inexpensive replacements for diesel. Electric-powered RTGs are only about 10 percent more expensive than diesel models.[58] The operating cost benefits of electric RTGs are significant because they result in maintenance cost savings and provide significant reductions in energy usage, on the order of 60 percent compared to diesel-fueled cranes.[59]

For the above reasons, the RDSEIR fails to overcome the presumption that requiring replacement of all RTG cranes at the terminal with zero emission RTGs is feasible.

ii. The yard tractor measures (MM AQ-15 and AQ-17) are feasible, and can be strengthened to require zero emission yard tractors

NRDC-29

The Port fails to overcome the presumption that the 2008 EIR mitigation measures for yard tractors are feasible. Moreover, the Port has failed to consider all feasible mitigation measures in

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[54] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment, III-11, table III-2 (2015), *available at* https://www.arb.ca.gov/msprog/tech/techreport/che_tech_report.pdf (Attachment E2).
[55] *Id.*; *see also* Attachment J8 (zero emission RTG by Kalmar).
[56] *Id.* at III-12.
[57] Final CAAP Update 2017 at 57.
[58] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-12.
[59] *Id*. at III-13.

revising its technology requirements for yard tractors. **The Port should strengthen MM AQ-15 to require the terminal to transition to all zero emission yard tractors.**

The 2008 EIR MM AQ-15 required that all yard tractors run on alternative fuel beginning in September 2004 (as required by the ASJ) through the end of 2014, and that by 2015 all yard tractors utilize the cleanest available NOx alternative fueled engines meeting 0.015 gm/hp-hr for particulate matter.[60] MM AQ-17 also required that China Shipping participate in an electric yard tractor pilot project, requiring them to deploy two electric yard tractors within one year of lease approval and, if the program was deemed successful, to replace half of the terminal's tractors with electric tractors within five years.[61]

The project did not achieve the alternative fuel requirement until four years after the ASJ deadline.[62] Today, none of the yard tractors meet the engine requirement, and the electric yard tractor pilot project has not been implemented.[63]

The RDSEIR deletes the electric yard tractor pilot project, and phases in compliance with an ultra-low NOx standard and Tier 4 standards for other criteria pollutants within five years of the effective date of the new lease amendment.

NRDC-29

The RDSEIR silently glosses over the deletion of the 2008 EIR requirement for deploying an electric yard tractor pilot project, without even attempting to provide a reason or explanation for the deletion. The record gives us no reason to believe that the demonstration project was infeasible. Communications between representatives of China Shipping and Los Angeles dated March 25, 2015 stated that WBCT would be able to participate in a one-year pilot project if a suitable tractor could be found, and failed to explain why it had not been implemented yet.[64] Suitable tractors were available at that time, and were being used at other terminals and facilities.[65] Successful implementation of the electric yard tractor pilot project would have resulted in some of the terminal's yard tractors being replaced with zero emission yard tractors, significantly reducing terminal emissions. Furthermore, as the San Pedro Bay Ports have stated in numerous reports and studies, demonstration of zero emission technologies is an important

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[60] RDSEIR at 2-4 (Table 2-1).
[61] *Id.* at 2-5 (Table 2-1).
[62] RDSEIR at 2-4 (Table 2-1).
[63] *Id.* at 2-4 - 2-5 (Table 2-1).
[64] Letter from Erich P. Wise, Flynn, Delich & Wise LLP, to Janna B. Sidley, Office of the City Attorney, City of Los Angeles (March 25, 2015) (Attachment A33 at POLA000995).
[65] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment, pp. III-17 to III-19, Table III-4 (Attachment E2); Port of Los Angeles, Zero Emission White Paper (July 2015), A1-3, Table A1-1 (Attachment C11).

step to accelerating deployment of emissions reducing technologies, creating markets, and sending demand signals to manufacturers.[66]

The Port also fails to provide substantial evidence justifying why the original yard tractor engine requirement was not met. As Los Angeles has recognized, China Shipping could have presented evidence of infeasibility when the 2008 EIR/EIS was certified, but chose not to do so.[67]

Further, the record indicates that the yard tractors serving the terminal could be replaced much faster than envisioned under the revised measure. In a March 25, 2015 letter, representatives for China Shipping indicated that replacements for the earliest purchased yard tractors would be due in three to five years, and that replacements for the 102 yard tractors purchased in 2007 and 2008 would come due in five to six years.[68] Under this logic, a feasible time frame for replacement tied to the useful life of the tractors could be due as early as March 2020, rather than five years after the effective date of the lease amendment, which Port predicts will be 2019.

In addition to demonstrating that the revised measure includes the most rapid feasible deployment schedule for cleaner yard tractors, the Port must also demonstrate that it is deploying the cleanest feasible technology, including electric yard tractors, hybrid electric engines, and Automated Guided Vehicles.[69] In particular, the Port's cursory dismissal of zero emission yard tractors does not satisfy CEQA and is not supported by the evidence. Various terminals at both ports are using electric yard tractors in regular operations.[70] Long Beach Container Terminal

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[66] The Port has recognized that demonstration projects are the pathway to commercializing future technologies that have life-saving emissions reductions. Its own Zero Emission White Paper lionized the importance of demonstration projects for yard tractors in demonstrating successful technologies for drayage trucks, stating that they are a preferred type of technology for demonstrations due to the controlled environment within the port, providing a "simpler and more stable platform for demonstration," and stating that "increased expenditures focused on developing off-road zero emission yard tractors would help to ***accelerate*** the commercialization of on-road short haul drayage trucks." Port of Los Angeles, Zero Emission White Paper at 55; 23–25. The White Paper lists extensive reasoning why developing zero emission yard tractors should be a priority for the Harbor District, including that demonstration is easier within the terminal, off-road requirements are less stringent, the limited range within the terminal reduces EV range anxiety, the potential for a large electric yard tractor market worldwide would accelerate commercialization, that longer term payback may be more palatable to yard tractor tech developers than electric drayage truck developers, and that electric yard tractor development complements development of heavy-duty trucks. *Id*. at 23–25.

[67] Letter from Janna Sidley, Office of the City Attorney, City of Los Angeles to China Shipping (March 3, 2015) (Attachment A32).

[68] Letter from Erich P. Wise, Flynn, Delich & Wise LLP to Janna B. Sidley, Office of the City Attorney, City of Los Angeles (March 25, 2015) (Attachment A33 at POLA000994).

[69] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment, at III-5, Table 1; III-6 to III-7; III-29.

[70] Final CAAP Update 2017 at 51, 57.

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(LBCT) at Middle Harbor is using electric yard tractors. Our understanding is that Trapac is also using electric yard tractors or equivalent equipment. As noted above, the Port should assess the electrified operations at both terminals and set forth similar measures here. Other examples of electric yard tractors in use include:

- At two terminals at the Port of Long Beach, California Energy Commission is funding a demonstration of 12 battery-electric yard tractors.[71]
- The Port of Los Angeles Everport terminal has a project underway to demonstrate eight zero emission yard tractors and 20 near-zero emission yard tractors.[72]
- The Port of Los Angeles Pasha terminal is demonstrating four zero emission electric yard tractors.[73]
- In March 2017, the first of 27 all-electric yard trucks started work at a freight yard in Southern California, funded by the State of California through a special emissions reduction program that aims to expedite commercialization of zero emission heavy-duty trucks.[74]
- Manufacturers TransPower, OrangeEV, and Balqon have conducted or planned electric yard tractor demonstration projects at several different sites in the U.S.[75]
- As part of the Zero-Emission and Near Zero-Emission Freight Facilities (ZANZEFF) project, the Port of Long Beach will deploy 33 battery-electric yard tractors, and the Port of Hueneme will use two zero emission yard tractors.[76]
- As part of Long Beach's Commercialization of POLB Off-Road Technology Demonstration Project (C-PORT), that port will deploy one battery-electric yard tractor at Long Beach Container Terminal at Pier E.[77]

In addition, there are currently at least three Zero Emission Class 8 Electric Tractors available on the market:

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[71] *Id.* at 57.
[72] *Id.*; CEC grant announcement (Attachment H3); Everport Terminal DEIR, presentation (Attachment C4).
[73] Final CAAP Update 2017 at 57.
[74] *See* CARB News Release: "First of 27 electric trucks coming to Southern California freight and rail yards," *available at* https://www.arb.ca.gov/newsrel/newsrelease.php?id=900 (Attachment H6).
[75] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-17 to III-19, Table III-4.
[76] CAAP Stakeholder Advisory Group Presentation Sept. 2018 *available at* http://www.cleanairactionplan.org/documents/presentations-9-26-18-caap-update-stakeholder-advisory-meeting.pdf/; https://www.portoflosangeles.org/references/news_091418_carb_toyota (Attachment C21).
[77] http://www.polb.com/news/displaynews.asp?NewsID=1741 (Attachment H14).

- TransPower - Electric Class 8 Electric Yard Tractor
- BYD - Electric Class 8 Tractor - 8Y
- Terberg - Electric Class 8 Yard Tractor - Terberg YT202-EV[78]

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Electric yard tractors are also cost effective, as their prices are expected to "drop significantly" as the technology matures, and their lifetime costs are reduced compared to traditional technologies because they save on engine maintenance, fuel costs, and employ a regenerative braking system that reduces brake wear.[79] For instance, Orange EV estimates that an owner of 10 electric yard trucks would save $6 million over 10 years in reduced fuel and maintenance costs.[80] The numerous deployments and manufacturers of zero emission yard tractors make it clear that requiring all electric yard tractors is feasible.

For the reasons stated above, the Port should strengthen MM AQ-15 to require replacing existing yard tractors with electric yard tractors in the near-term.

iii. The forklift measure (MM AQ-17) is feasible and should be strengthened to require zero emission forklifts

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The 2008 EIR MM AQ-17 required that starting in January 2009, all forklifts purchased meet certain engine standards,[81] and that all forklifts meet Tier 4 off-road engine standards by the end of 2012. It is unclear from the RDSEIR to what extent these original mitigation requirements were complied with. The terminal also fails to comply with CAAP measure SPBP-CHE1, which required all forklifts to meet Tier 4 off-road engine standards by 2012.[82]

The RDSEIR provides no explanation for why the original mitigation measure became infeasible. Nevertheless, the Port proposes a revised measure that replaces 18-ton diesel forklifts with Tier 4 or cleaner engine forklifts from one to three years after the effective date of the new lease amendment. The revised measure also requires 5-ton forklifts of model years 2011 or older to be replaced with zero emissions units two years after the effective date of the new lease

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[78] *Supra note* 75; *see also* Attachments J1–J2, J13, J20 and J23 (data from technology manufactures including BYD, Terberg, and Transpower).
[79] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20.
[80] *Id.* (citing Orange EV, Lower Total Cost of Ownership – Orange EV, May 2015, http://orangeev.com/lower-total-cost-of-ownership/).
[81] Starting January 2009, equipment purchases including forklifts shall be either 1) the cleanest available NOx alternative-fueled engines meeting 0.015 gm/hp-hr for PM or 2) the cleanest available NOx diesel-fueled engine meeting 0.015 gm/hp-hr for PM; and if no engines are available to meet that standard, the new engines shall be cleanest available and have cleanest VDEC. FEIR Mitigation List.
[82] CAAP Update 2010 at 28.

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amendment.[83] While we support the Port's effort to require replacement of 5-ton forklifts with electric forklifts, the Port must go further to satisfy CEQA's mandate to consider all feasible mitigation measures. **The Port should strengthen MM AQ-17 to require the terminal to transition to all zero emission forklifts by 2030, starting with transitioning the oldest lower capacity equipment to zero emission.**

Both fuel cell electric forklifts and battery-electric forklifts are available. Lower capacity battery electric forklifts are commercially available and widely used in warehouse applications.[84] Battery electric forklifts are only 10-20 percent higher in capital cost than diesel forklifts for capacities of up to 6,000 pounds, and the return on investment for a battery electric forklift can be as short as 1 to 3 years due to reduced fuel and maintenance costs.[85] Fuel cell forklifts are also widely used, with about 8,000 hydrogen fuel cell electric forklifts operating at U.S. manufacturing facilities and warehouses, and 800 deployed in California.[86]

We were surprised to see that the project does not commit to an all zero emission hi-tonnage forklift requirement or even a demonstration project for that technology. The Port's claim that it is not feasible to electrify 12-ton and larger forklifts because forklifts above five tons are not available in all-electric models does not satisfy the CEQA requirement to consider all feasible mitigation measures.[87] Contradicting this statement, CARB has recognized that at least one manufacturer makes a forklift model with a lift capacity of 40,000 pounds, and lift capacities of up to 100,000 pounds are advertised.[88] And, the Pasha terminal at the Port of Los Angeles is demonstrating two hi-tonnage zero emission forklift retrofits.[89]

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[83] The Port must include additional information clarifying how many and which forklifts will be upgraded. According to Table B1-C, there is a schedule to replace 12 forklifts, upgrading 5 diesel forklifts of up to 18 tons to Tier 4 diesel or alternative fuel meeting Tier 4 (between 2019 and 2021), and another 7 LPG forklifts with capacities up to 5 tons upgrading to electric (2020). But the DSEIR indicates that there are 15 forklifts associated with the China Shipping terminal, so 3 are not accounted for in the replacement schedule.
[84] *See, e.g.*, Attachment J6 (describing Kalmar's electric forklift).
[85] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20 to III-21 (also referencing (LiftsRUs, 2014) (EPRI, 2014)); CARB Mobile Source Strategy, App. A at A-24 (Typically, maintenance costs 25 to 50 percent less, fuel is 20 to 40 percent of the cost of fueling an internal combustion forklift, and electric forklifts have a 50 percent longer useful life than internal combustion forklifts. These benefits can lead to payback time on the higher initial capital cost in as little as one year.).
[86] CARB Draft Heavy-Duty Technology and Fuels Assessment: Overview at 10. Manufacturers include Crown, Raymond, Hyster, Caterpillar, and others, and are in the early commercialization phase as of 2015. (Attachment E1)
[87] RDSEIR at 3.1-54.
[88] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20.
[89] Final CAAP Update 2017 at 57.

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Replacing the hi-tonnage forklifts with new diesel equipment—as the revised measure envisions—invests the terminal in additional polluting equipment for the long-term, leaves emissions reductions on the table, and hinders the terminal's ability to achieve 100% zero emission cargo handling equipment by 2030 as required by the CAAP, CARB regulations, and Mayors' Executive Directive.

For the reasons stated above, the Port should require all forklifts to be replaced with zero emission forklifts.

iv. The top-pick measure (MM AQ-17) is feasible, and should be strengthened to require zero emission top-picks

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The 2008 EIR MM AQ-17 required that by January 1, 2009, all toppicks shall have the cleanest available NOx alternative fueled engines meeting 0.015 gm/hp-hr for PM.[90] As of 2014, none of the toppicks were alternative-fueled and only four meet the 0.015 gm/hp-hr PM standard.[91] The terminal also falls short of the CAAP, Measure SPBP-CHE1, Performance Standards for cargo handling equipment, which required toppicks to meet Tier 4 off-road engine standards by the end of 2012.[92]

The RDSEIR proposes to abandon the alternative fuel requirement and push back the engine standard deadline, requiring a phased replacement of toppicks with Tier 4 off-road engines over the course of five years after the effective date of the new lease amendment. Instead, **the Port should require replacement of top picks with battery electric top picks by 2030, with interim milestones to phase-in the technology.**

The Port does not overcome the presumption that the 2008 EIR MM AQ-17 for toppicks is feasible, and at best asserts generic arguments that complying with the measure would increase China's Shipping's costs.[93]

Further, the Port's proposed schedule for replacing the top-picks is not the fastest feasible schedule. In a letter dated March 25, 2015, representatives for China Shipping wrote that the 8 top picks purchased in 2002 (which have Tier 1 engines) could be replaced in the following 18 months (by mid-2016), and that a reasonable timeframe to replace the other 30 was 3–5 years (2018 to 2020).[94] The Port fails to explain why the Tier 1 toppicks were not replaced in 2016, even though it appears that this would have been feasible. At minimum, the eight Tier 1 toppicks should be replaced with zero emission or Tier 4 complaint toppicks upon operation of the Revised Project, and the remaining toppicks should be replaced within two years.

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[90] RDSEIR at 2-4 (Table 2-1).
[91] *Id.*
[92] CAAP Update 2010 at 128.
[93] RDSEIR at 2-19.
[94] Letter from Erich P. Wise, Flynn, Delich & Wise LLP to Janna B. Sidley, Office of the City Attorney, City of Los Angeles (March 25, 2015) (Attachment 33 at POLA000995).

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Electric toppicks are currently being demonstrated at other terminals. The Pasha terminal at the Port of Los Angeles is testing a zero emission top handler retrofit.[95] The Everport terminal is demonstrating two zero emission top handlers.[96] And the ZANZEFF project will deploy one battery electric top handler.[97]

At a minimum, the Port should require the terminal to participate in a zero emission toppick demonstration project, or to require installation of electric toppicks contingent on the result of its demonstration at e.g., Pasha or Everport.

v. The revised measure for sweepers and shuttle buses (MM AQ-17) should be strengthened to require near-term replacement with zero emission technologies

NRDC-32

The RDSEIR proposes revised measures for sweepers and shuttle buses, requiring gasoline shuttle buses to be zero emission units by seven years after the effective date of the new lease amendment and requiring sweepers to be alternative fuel or cleanest available six years after the effective date of the lease amendment. While we support the Port's efforts to transition to zero emission shuttle buses, **the Port should strengthen MM AQ-17 to require immediate replacement with electric shuttle buses and revise MM AQ-17 to require implementation of battery electric sweepers.**

Preliminarily, the RDSEIR makes it impossible to evaluate whether the proposed revisions are legitimate. The RDSEIR does not explain which of the original mitigation measures it is relaxing with respect to sweepers and shuttle buses, nor does it assess compliance rates. Without this assessment, it is impossible to know how the original measures are revised.

Further, the RDSEIR fails to provide any justifications for its proposed deadline to replace diesel powered sweepers and shuttle buses. Zero emission buses are commercially available today, and are quickly dropping in price.[98] Over 100 vehicles have been deployed.[99] For example, Phoenix Motorcars manufactures an electric zero emission shuttle bus that can drive up to 100 miles per charge and costs only $100,000 more than a similar diesel model.[100] In addition, battery electric powered sweepers "are mature technologies that are in use at distribution centers and manufacturing plants."[101]

For the reasons stated above, the Port should revise MM AQ-17 to require immediate replacement of shuttle buses with zero emission buses, and require battery-electric sweepers.

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[95] Final CAAP Update 2017 at 57.
[96] *Id.* at 43.
[97] Attachment C21 (CAAP Stakeholder Advisory Group Presentation Sept. 2018).
[98] CARB Draft Heavy-Duty Technology and Fuels Assessment: Overview at ii, 8-9.
[99] *Id.* at 11.
[100] *Id.* at 12.
[101] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20.

vi. Lease measures AQ-1 and AQ-3 are not a substitute for considering all feasible mitigation measures

NRDC-33

Lease Measures AQ-1 and AQ-3 do not satisfy the Port's duty under CEQA to consider all feasible mitigation measures. Lease Measure AQ-1 seeks to phase-in feasible zero emissions and near zero emissions cargo handling equipment when existing equipment is replaced, or new equipment is purchased and added to the existing fleet. The measure contains vague language and no assurance that emissions reducing technology will result from the measure. Preliminarily, it is not clear how this lease measure interacts with MM AQ-17, which requires the phase in of *diesel* equipment after the lease amendment is executed. Moreover, the lease measure does not include the most rapid feasible deployment schedule for cleaner equipment since it allows older equipment to be replaced based on the Tenant's "procurement plan" and at natural fleet turnover rates.

Lease Measure AQ-3 requires the tenant to conduct a one-year zero emission demonstration project with at least ten units of zero emission cargo handling equipment, and then assess the feasibility of using that equipment. The Lease Measure does not specify what types of cargo handling equipment should be included, nor when the demonstration project is due. The tenant is not required to conduct a feasibility assessment evaluating zero emission technologies until 2020 and 2025, yet Lease Measure AQ-3 purports to support the goal of transitioning to zero and near-zero emission technologies by 2030. Finally, relying on the tenant's self-assessment of zero emission technology to determine feasibility cannot be counted on to lead to emission reductions, since it is in the tenant's best interest to avoid implementing zero emission technologies that can be costlier in the near term than sticking with status quo polluting equipment.

F. The LNG truck measure (MMAQ-20) is feasible, and can be strengthened to require zero emissions vehicles

NRDC-34

In 2008, after a thorough study that included pulling back and revising the initial DEIR, the Port concluded that phasing-in LNG trucks at the China Shipping terminal was feasible. In 2013, the Port concluded that a similar facility-specific phase-in of cleaner trucks was feasible at the near-dock Southern California Intermodal Gateway (SCIG) project.[102]

Nothing has changed about the Port drayage system from 2008 to the present. Hundreds of LNG trucks now serve the Port. LNG trucks composed 8.2% of the Port's truck calls in 2014, with the

[102] Los Angeles Harbor Department, Final Mitigation and Monitoring Program, SCIG Project EIR at 2-9 (March 2013) (MM AQ-8 requires phasing-in "low-emission drayage trucks" at the SCIG facility) (Attachment C9).

percentage likely increasing in future years.[103] Class VIII LNG trucks are readily available in the market.[104]

Rather than try to fix the problem that it caused, the Port now wants to avoid the whole issue by saying, for the first time in any EIR, that a terminal-specific drayage plan is infeasible. This systemic infeasibility argument is a litigation artifact, manufactured after the Port got caught violating CEQA. In hundreds of pages of documents that predate the disclosure of the Port's failure to meet the 2008 mitigation measures, the Port never once asserted that any of the 2008 mitigation measures was infeasible—in fact, the Port strongly criticized China Shipping for failing to present data on infeasibility. Nor does the Port's new argument meet the CEQA definition of infeasibility. Moreover, the Port's do-nothing approach to diesel trucks violates Mayor Garcetti's recent zero emission policy directive and exacerbates the greenhouse gas problem that the Port admits that it has.[105]

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Today, much more is possible than was the case in 2008. Now, there are feasible opportunities to move to zero emission drayage and reducing the number of diesel truck trips associated with the terminal. Intra-port drayage, for example to the proposed new HPEC peel-off yard, can be handled now by available electric trucks with 100 miles plus of range. Short-haul zero emission trucks with 100-mile range and 1–3 hour charge times are available now that can service the near-dock railyards and peel-off yards. Trucks with a 200-mile range and faster charging time or replaceable batteries are being developed and tested now in Los Angeles and Long Beach, supported by massive amounts of grant funding. Additional funding from the Volkswagen cheating scandal settlement will be available in 2019. These zero emission trucks are huge improvements over 2008 LNG trucks and diesel trucks, and will help with the Port's air pollution and greenhouse gas problems. As we pointed out in our September 27, 2017 letter, still uncontradicted by the Port, longer drays will soon be possible with equipment from Volvo, BYD and others, and the Port should require China Shipping to commit to their use.

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[103] DSEIR App. B at B-12.

[104] *See, e.g.,* "Natural Gas: What Fleets Need to Know, Part 2 – New Engines, More Options," *available at* http://www.truckinginfo.com/channel/fuel-smarts/article/story/2012/09/natural-gas-what-fleets-need-to-know-part-2-new-engines-more-options.aspx (Attachment J29); Cascadia Natural Gas: https://freightliner.com/trucks/cascadia-natural-gas/ (Attachment J30); https://cumminsengines.com/volvo; Kenworth: "Kenworth T680 and T880 Add Cummins Westport ISL G Near Zero Emissions Natural Gas Engine," *available at* http://www.kenworth.com/news/news-releases/2016/october/isl-g/; Peterbuilt: "Peterbuilt models 579, 567 Now Available with LNG Power," *available at* http://www.peterbilt.com/about/media/2015/459/ (Attachment J31); Mack: "Cummins Westport 1SX12 G Natural Gas," *available at* https://www.macktrucks.com/powertrain-and-suspensions/engines/cummins-natural-gas/.

[105] Joint Directive (Attachment D5); DSEIR at 3.2-21–3.2-41.

i. The LNG truck measure (MMAQ-20) is and was feasible

Mitigation measure MMAQ-20 in the 2008 EIR required a phase in of LNG trucks.[106] This did not happen. The Port knew contemporaneously that the phase-in was not happening because it had truck make information available to it through the port truck registry,[107] but did nothing to enforce the legally-binding mitigation measure except to nag China Shipping—which never agreed or expected to fund the LNG trucks.

In 2013, the Port approved a huge near-dock intermodal railyard project, SCIG. One of the approved mitigation measures called for a phase in of LNG-equivalent trucks to service the SCIG facility.[108] Although the SCIG matter was in litigation for years, the Port never claimed in that litigation that this drayage measure is infeasible.

In fact, LNG trucks are in use now at the Port, as the Port's own data shows,[109] and others are readily available if it were a good idea to add them to the fleet now.[110] From a logistics standpoint, having one or two facilities served by LNG trucks is feasible as the Port recognized in 2008 and 2013 by the method of turning away non-LNG trucks at the gate.[111] Other measures to increase use of cleaner trucks could include expanding Pier Pass (encouraging trucks to work the Port in the evening), enacting a dirty truck rate and creating a preferential lane for clean trucks (as the Port contemplates in its Clean Air Action Plan), requiring cleaner trucks going to peel-off yards (also as contemplated in the Clean Air Action Plan), and providing other incentives through an appointment system such as are now in place at the TraPac facility and Middle Harbor in Long Beach.

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Thus, nothing in the RDSEIR overcomes the presumption that the previously certified LNG truck measure is feasible. *See Napa Citizens*, 91 Cal. App. 4th at 359. The factual circumstances provided in the RDSEIR for why the measure is not feasible today, RDSEIR at 2-19 to 2-20, existed in 2008; nothing has changed. The RDSEIR did not attempt to rebut the facts presented in our September 29, 2017 letter. The fact that the current Port administration has changed its mind to rationalize its failure to comply with binding mitigation measures has no bearing on the legal issues at play.

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[106] FEIR Mitigation Monitoring and Reporting Program.
[107] The Port of Los Angeles' drayage truck registry website is available at https://www.portoflosangeles.org/ctp/ctp_pdtr.asp.
[108] SCIG Final Mitigation and Monitoring Program at 2-9 (Attachment C9). The SCIG mitigation measure MM AQ-8 required phasing in "low-emission drayage trucks" at the SCIG facility. Such trucks were required to meet emissions standards that were comparable to LNG trucks at the time.
[109] *See* DSEIR App. B at B-12 (LNG trucks composed 8.2% of the Port's truck calls in 2014, with the percentage likely increasing in future years).
[110] *See supra* at note 127.
[111] *See* China Shipping FEIR, Responses to Comments at 2-188–2-189; SCIG FEIR, Responses to Comments Vol. 1 at 2-258–2-259 (Attachment C17).

ii. Zero emission drayage trucks are available now for short-haul

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Zero emission drayage trucks are not a future science fiction fantasy. They are here now, particularly in short-haul applications that would be suitable for hauling containers from the Port to nearby off-dock railyards such as ICTF and SCIG (if SCIG is ever built). The South Coast Air Quality Management District (SCAQMD) recently described the status of zero emission drayage truck technology as follows:

> Heavy-duty diesel trucks in the South Coast Air Basin remain a significant source of emissions with adverse health impact, especially in the surrounding communities along the goods movement corridors near the Ports of Los Angeles and Long Beach (Ports), and next to major freeways. In order to mitigate the impact and attain stringent national ambient air quality standards for the region, SCAQMD has been aggressively promoting and supporting development and demonstration of advanced zero emission cargo transport technologies, in partnership with the Southern California Regional Zero Emission Truck Collaborative, comprised of the Los Angeles Metropolitan Transportation Authority, the Ports of Los Angeles and Long Beach, the Southern California Association of Governments, and the Gateway Cities Council of Governments.
>
> With two grants, totaling approximately $14 million from the DOE's Zero Emission Cargo Transport (ZECT) Program, the SCAQMD has engaged leading EV integrators, including BAE Systems, Transportation Power (TransPower) and US Hybrid, as well as a major truck manufacturer, Kenworth, to develop and demonstrate a variety of Class 8 electric drayage trucks, consisting of eleven zero emission trucks – six battery electric and five fuel cell trucks – and seven hybrid electric trucks with extended range using CNG, LNG or diesel ICEs. These trucks are deployed in real world drayage operations to evaluate the trucks' performance and capability as well as to identify limitations in supporting demanding drayage duty cycles. To date, five battery electric trucks (BETs) have been completed and deployed in field demonstration with drayage fleets at the Ports. With an estimated range of 80 to 100 miles per charge, these BETs are deployed in neardock and local operations within a 20-mile radius from the Ports and have been providing dependable service with positive feedback from fleet drivers on its quiet and smooth operations with sufficient power and torque. In addition, one CNG plug-in hybrid electric truck (PHET), with 30-40 miles in allelectric range (AER) and 150-200 miles of total operating range, is currently undergoing final validation testing before deployment and four more trucks, including two fuel cell trucks with 150-200 miles of range, are expected to be completed in Q1 2017.
>
> Leveraging the technologies and expertise gained from the ZECT program, SCAQMD proposed and received a $23.6 million grant from CARB under the Low Carbon Transportation Greenhouse Gas Reduction Fund (GGRF) Investment Program for a larger-scale demonstration of advanced electric drayage truck technologies in 2016. The project is to develop a portfolio of most commercially

promising zero and near-zero emission drayage trucks for a statewide demonstration, across a variety of drayage applications in and around the Ports of Long Beach, Los Angeles, Oakland, Stockton and San Diego. SCAQMD has partnered with the four largest and most emission-impacted air districts in the state, namely Bay Area AQMD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD and San Diego APCD, to build a comprehensive and coordinated approach to demonstrate the electric drayage trucks in diverse geographic and operational challenges across the state's interconnected goods movement system.

For the project, the SCAQMD has successfully engaged three major truck OEMs – Kenworth, Peterbilt and Volvo, and an international OEM leader in heavy-duty electrification, BYD, to drive commercially-viable product development stages in a targeted portfolio of zero emission and near-zero emission technologies and efficiency solutions, consisting of two battery-electric trucks, and two plugin hybrid electric trucks with extended range capability, using natural gas or diesel ICEs, as follows:

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BYD will develop 25 battery electric trucks based on their T9 prototype, which is optimized to serve near-dock and short regional drayage routes with a range of up to 100 miles. The truck is designed to provide similar operating experience compared to equivalent diesel and CNG trucks with matching or exceeding power and torque, using two 180 kW in-line traction motors.

Kenworth will develop four plug-in hybrid electric trucks with natural gas range extender, leveraging the prototype development under the ZECT program. These vehicles will target longer regional drayage routes, based a well-balanced blend of all electric and CNG-based hybrid operation to provide 250 miles in total operating range with a capability to operate 30-40 miles in zero emission mode in disadvantaged communities near ports, rail yards and distribution centers. The powertrain system includes a 200 kW genset using the recently certified 8.9L near-zero CNG engine and two AC traction motors, with comparable power output to Class 8 diesel trucks.

Peterbilt has partnered with TransPower to develop 12 battery electric drayage trucks, building on a platform developed under the ZECT program, incorporating lessons learned from ongoing demonstrations to further refine and optimize the electric drive system. Eight of the twelve trucks will be designed to provide up to 80-100 miles in range to support near-dock drayage routes, and four extended-range battery electric trucks will incorporate a new, higher energy density battery cells to provide up to 120-150 miles of operation to service regional drayage routes, such as from the San Pedro Bay Ports terminals to Inland Empire warehouses.

Volvo will build on the success of a past SCAQMD/DOE-funded project by focusing on efficiency and emission optimization of a commercially attractive, highly-flexible product, while ensuring zero emission miles for operations in the

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> most heavily emissions impacted communities. Furthermore, Volvo, in partnership with LA Metro, will also integrate ITS connectivity solutions, such as vehicle-to-infrastructure and vehicle-to-vehicle communications targeting dynamic speed harmonization and reduced idling, to reduce fuel use and emissions.
>
> This exceptional portfolio features demonstrations of truly commercial-pathway trucks. Highlighting the commercial path reality of this portfolio, the principal contractors are all major heavy-duty truck OEMs. This is significant because major OEMs can bring necessary engineering resources, manufacturing capability, and a distribution/service network to support the future commercialization of these demonstration vehicles. Our partnership also includes LA Metro's participation with ITS efficiency integration, electric utility participation, and 13 confirmed end-user fleets who are experienced with the specific challenges and opportunities associated with early technology integration efforts. The relationships and technologies in this project represent a culmination of years of experience: leading truck manufacturers, innovative large and medium suppliers, air quality management districts and industry groups all coordinated in a focused push to create OEM-quality, commercially-viable products that both reduce criteria and carbon emissions.

South Coast Air Quality Management District, Technology Advancement Office, *Clean Fuels Program 2016 Annual Report and 2017 Plan Update* (March, 2017) at 16–18.[112] See also http://news.cision.com/ab-volvo/r/volvo-trucks-to-introduce-all-electric-trucks-in-north-america,c2629974 (Volvo will introduce all-electric truck demonstrators in California in 2019 and commercialize them in North America in 2020).

With regard to funding, over $200 million in additional grant funds for zero emission trucks became available in 2018, see https://www.trucks.com/2018/09/28/california-415-million-funding-clean-trucks-freight-handling/, and over $400 million in proceeds from the Volkswagen settlement will be available in the summer of 2019; see https://www.arb.ca.gov/msprog/vw_info/vsi/vw-mititrust/vw-mititrust.htm.

The RDSEIR ignores this information. It also ignores the June, 2017 Joint Executive Directive from Mayors Garcia and Garcetti (issued the same week the DSEIR was published) confirming Los Angeles and Long Beach's commitment to transition to a zero emission freight transportation system, which includes a commitment to an all zero emission drayage fleet by 2035.[113] Also ignored are similar proclamations from Governor Brown, the state legislature (SB

[112] Attachment E16; *see also* South Coast Air Quality Management District, PowerPoint, Zero Emission Drayage Truck Demonstration: Low Carbon Transportation Greenhouse Gas Reduction Fund (Nov. 1, 2016) (discussing demonstration project of 43 zero emission drayage trucks from BYD, Peterbilt, Kenworth and Volvo). (Attachment E15).

[113] Joint Directive (Attachment D5).

350),[114] and state and local air quality regulators that California must transition to a zero emission transportation system for passengers and freight to meet the state's air quality standards and greenhouse gas reduction goals.[115]

Importantly, recent evidence from CARB shows that battery electric drayage trucks have a lower life cycle cost than even diesel trucks, with costs further declining in 2023.[116] Thus, we believe that the Ports should require, as a feasible mitigation measure, the following minimum percentages of zero emission trucks at the terminal:

- 2020: 1.5% Zero Emission Trucks
- 2024: 25% Zero Emission Trucks
- 2028: 60% Zero Emission Trucks
- 2030: 90% Zero Emission Trucks
- 2035: 100% Zero Emission Trucks

This is a balanced commitment that will ramp up to 100% over the next seventeen years, ultimately meeting the goal directed by the Mayors of Los Angeles and Long Beach. It can be met at China Shipping and at all terminals in both ports.

NRDC-36

Further, given that zero emission trucks for short-haul applications are feasible today, the Port should also consider how it can require short-haul drayage trips through the terminal to use such trucks. For example, the Port should consider requiring short-haul deliveries to and from near dock railyards or peel-off yards to be performed by zero emission trucks.

It is not factually or legally permissible for the Port to throw up its hands and give up on China Shipping truck mitigation. The Port needs to get back to work and analyze feasible alternatives to the existing diesel fleet and show real movement to meeting Mayor Garcetti's directive.

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[114] SB 350 directs agencies, including the Ports of Los Angeles and Long Beach, to prioritize widespread "transportation electrification" as a necessary step toward complying with state law and attaining ambient air quality standards. Pub. Util. Code § 740.12 (a)(1)(A), (a)(2) ("Advanced clean vehicles and fuels are needed to reduce petroleum use, to meet air quality standards, to improve public health, and to achieve greenhouse gas emissions reduction goals . . . It is the policy of the state and the intent of the Legislature to encourage transportation electrification as a means to achieve ambient air quality standards and the state's climate goals. Agencies designing and implementing regulations, guidelines, plans, and funding programs to reduce greenhouse gas emissions shall take the findings described in paragraph (1) into account.").

[115] Office of Governor Edmund G. Brown Jr.: "Executive Order B-32-15," *available at* https://www.gov.ca.gov/news.php?id=19046 (Attachment D3); CARB Sustainable Freight: Pathways to Zero and Near-Zero Emissions (Discussion Draft) at 1, *available at* https://www.arb.ca.gov/gmp/sfti/Sustainable_Freight_Draft_4-3-2015.pdf (Attachment D9).

[116] Attachment C16 at exhibit entitled "Advanced Clean Local Trucks (Aug. 30, 2017)."

iii. The feasibility problem, if it exists, can be solved with a port-wide solution as contemplated in the mayors' executive directive

NRDC-37

The Mayors' joint proclamation puts both ports on a path to zero emission technology, including drayage trucks. If the Port believes that a trucking system involving only two facilities, China Shipping and SCIG, is not optimal, the Mayors' proclamation sets out a path for fixing that, Port-wide. But the RDSEIR fails to analyze this.

G. The priority access for cleaner drayage measure (LM AQ-2) should be limited to zero emission trucks

NRDC-38

The RDSEIR sets forth the following lease measure: "A priority access system shall be implemented at the terminal to provide preferential access to zero- and near-zero emission trucks." RDSEIR at 3.1-4. Because of the emissions and greenhouse benefits of zero emission trucks, and the zero emission goals of the Port and City, this measure must be strengthened to only provide priority access for zero emission trucks.

H. The Port should keep and amend the throughput tracking measure (LM AQ-23)

NRDC-39

Like the DSEIR before it, the RDSEIR proposes to delete the following lease measure in the FEIR:

> If the Project exceeds project throughput assumptions/projections anticipated through the years 2010, 2015, 2030, or 2045, staff shall evaluate the effects of this on the emissions sources (ship calls, locomotive activity, backland development, and truck calls) relative to the EIS/EIR. If it is determined that these emissions sources exceed EIS/EIR assumptions, staff would evaluate actual air emissions for comparison with the EIS/EIR and if the criteria pollutant emissions exceed those in the EIS/EIR the new or additional mitigations would be applied through MM AQ-22 Period Review or New Technology Regulations.

RDSEIR, Table 2-1. The Port continues to contend that this measure is not necessary because the RDSEIR "already takes into account the maximum capacity of the terminal and growth in TEU volume, and applies all feasible mitigation measures to address future air quality impacts." RDSEIR at 2-24.

As we stated in our prior letter on the DSEIR, this measure should be retained. There is simply no basis for removing it, especially given the Port's history of noncompliance with mitigation measures and the fact that throughput projections have exceeded the projections in the 2008 EIR. Further, contrary to the Port's suggestions otherwise, neither LM AQ-22 (Periodic Review of New Technology Regulations) nor LM AQ-1 (Cleanest Available Cargo Handling Equipment) are adequate substitutes for the throughput tracking measure, for the reasons we stated in our previous letter.

NRDC-39

This measure should be retained because the Port has never claimed it is infeasible. Further, it should be amended to reflect annual evaluations, and be compared to emissions analysis contained in the RDSEIR (subject to the recommended revisions noted in this letter) as opposed to the 2008 EIR/EIS.

III. Additional mitigation measures are available to reduce the project's significant operational emissions

NRDC-40

The RDSEIR concludes that the Revised Project will result in the following new or substantially more severe significant and unavoidable impacts compared to the Approved Project:

- Revised Project emissions of carbon monoxide (CO) would be significant in analysis years 2012, 2014, 2018 and 2023. Emissions of nitrogen oxides (NOx) would be significant in analysis years 2014, 2018, 2023, 2030 and 2036. Emissions of volatile organic compounds (VOC) would be significant in analysis years 2014 through 2045. Emissions of all other criteria pollutants would be less than significant.
- Revised Project ambient concentrations would be significant for federal 1-hour NO2 in 2014 and 2018, state 1-hour NO2 in 2014, annual NO2 in 2014 and 2018, 24-hour PM10 in 2014 through 2045, and annual PM10 in 2014 through 2045. Impacts of SO2, CO, and PM2.5 would be less than significant.
- Cancer risks of the Revised Project relative to the floating Future Baseline would be significant for residential, sensitive, and occupational receptor types. Cancer risks relative to the static baseline would be less than significant. Chronic and acute non-cancer health impacts and cancer burden would be less than significant.

RDSEIR 3.1-4. As noted above, had the RDSEIR's air quality analysis been accurately performed, we believe that the Revised Project's significant air quality impacts would be larger in scope and severity. *See supra* Section I.

In any event, the RDSEIR's finding of significant impacts, triggers the duty to consider and adopt all feasible mitigation prior to project approval. Cal. Pub. Res. Code §§ 21002; 21061.1. Contrary to CEQA, the RDSEIR narrowly revises mitigation for select source categories, and fails to set forth a broader range of strategies that could reduce operational emissions. In addition, the RDSEIR makes no attempt to consider any measures to offset the excess emissions experienced by the community due to the Port's failure to fully implement the measures in the 2008 EIR. Stated differently, while the RDSEIR offers revised measures for the mitigation the Port did not adopt, this fact alone does not demonstrate CEQA compliance. The RDSEIR must demonstrate that all feasible mitigation for the project's operational air quality impacts (past, present, and future) will be adopted. Cal. Pub. Res. Code §§ 21002; 21061.1. This analysis is broader than the RDSEIR's narrow re-evaluation of seven specific mitigations from the 2008 EIR.

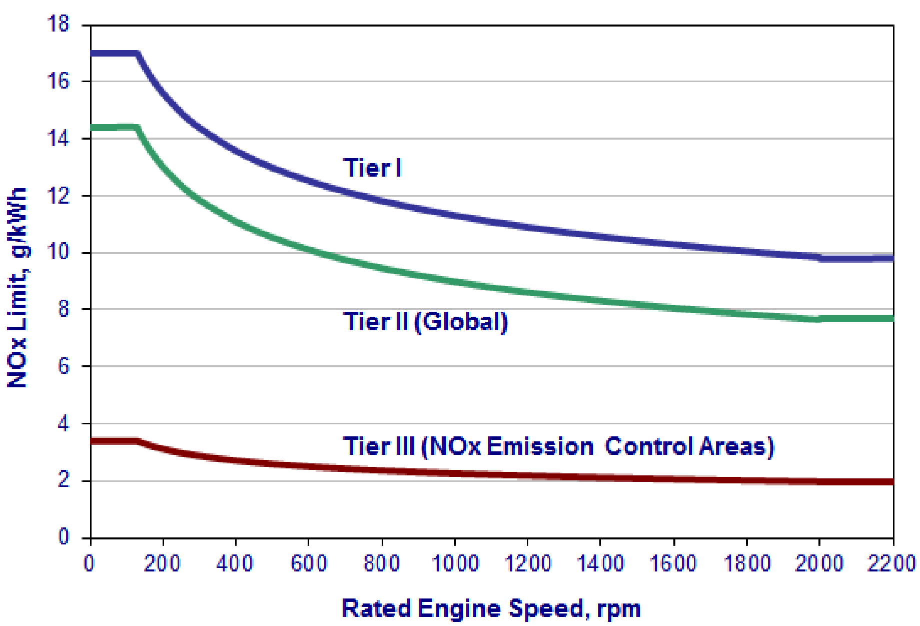
NRDC-41

A. Rerouting cleaner ships

The 2008 EIR included a measure (MM AQ-13) that attracted newer, cleaner vessels to the project. MM AQ-13 stated "When scheduling vessels for service to the Port of Los Angeles, Tenant shall ensure that 75 percent of all ship calls to the Berth 97-109 Terminal meet IMO MARPOL Annex VI NOX emissions limits for Category 3 engines."[117] The RDSEIR indicates that the Port is in full compliance with this measure,[118] which encouraged Tier 1 vessels to call at the terminal.

Since the adoption of MM AQ-13, the IMO has established cleaner engine standards for ships that reduce NOx emissions. Tier 2 engines, which were required to be installed on new ships beginning in 2011, are 15% cleaner than the previous generation of engines, and Tier 3 engines, which were available beginning in 2016, are 75% cleaner than Tier 2 vessels.[119] The following diagram depicts the emissions benefits of using Tier 2 and Tier 3 vessels over Tier 1.

MARPOL Annex VI NOx emission limits[120]



The RDSEIR should consider measures that would encourage the rerouting of Tier 2 and Tier 3 vessels to Berths 97-109 by requiring a certain percentage of such vessels to call at the terminal by a certain date, with increased percentages over time. The Port's ability to successfully

[117] FEIR Mitigation and Monitoring Program.
[118] RDSEIR at Table 2-1 (limiting noncompliance to the 10 mitigation measures and one lease measure identified in Table 2-1).
[119] Final CAAP Update 2017 at 65.
[120] International IMO Marine Engine Regulations, *available at* https://www.dieselnet.com/standards/inter/imo.php (Attachment G5).

implement its previous "rerouting cleaner ships" measure (MM AQ-13) indicates that such measures can and should be considered.

In 2016, 19% of vessel calls to San Pedro Bay were made by Tier 2 ships, and were mostly larger container vessels.[121] And in 2025, due to forecasted fleet turnover, the Port projects that roughly 65% of total vessels calls will be by container vessels that meet Tier 2 standards.[122] The RDSEIR should take such information into account to determine how to accelerate the pace of cleaner ships visiting the China Shipping terminal. The precise percentages and dates in which cleaner ships should be phased-in could have been subject to a feasibility assessment in the RDSEIR.

NRDC-41

Further, while we understand that the Port does not project the first Tier 3 ship to visit the San Pedro Bay Ports until 2026 (at the earliest),[123] the Revised Project consists of a 40-year lease that will extend until 2045.[124] Accordingly, the Project's long life provides an opportunity for the Port to encourage Tier 2 *and* Tier 3 ships at the terminal before 2045.

The Revised Project should include measures that require the rerouting of cleaner ships to the China Shipping terminal as a method for reducing ship emissions, which is consistent with the direction of the Final CAAP Update 2017, and recent CARB recommendations.[125] As the Port is aware, ships are the largest source of maritime goods-movement-related NOx emissions, comprising 51% of the San Pedro Bay Ports total NOx emissions in 2016. Of those ship emissions, more than half are associated with ships transiting or maneuvering within approximately 100 nm of the ports.[126] As documented by the diagram above, encouraging cleaner vessels to visit Berths 97-109 would reduce operational emissions, and by significant amounts. For these reasons, the RDSEIR should have considered how it can encourage cleaner vessels to visit the project. Otherwise, it is leaving unmitigated operational emissions on the table in violation of CEQA.

B. Funding mitigation programs

NRDC-42

The Port should also consider contributing grant funds to air pollution mitigation programs, including those that could be administered by the Harbor Community Benefit Foundation, and Technology Advancement Program. Such programs could fund, for example, additional air filtration systems and maintenance for existing systems, vegetation buffers for sensitive receptors, or zero emission technologies, and thus "avoid[]," "minimize[e]," "rectify[],"

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[121] Final CAAP Update 2017 at 67.
[122] *Id.* at 69.
[123] *Id.* at 68.
[124] RDSEIR at 2-2.
[125] Final CAAP Update 2017 at 67-70; CARB Comments on Everport DEIR at 4 (Attachment E6).
[126] Final CAAP Update 2017 at 65.

NRDC-42

"reduc[e]," and/or "compensat[e]" for the community's long-term exposure to the project's operational emissions. CEQA Guidelines § 15370.

By way of example, to help reduce air quality impacts from the Port of Long Beach's Middle Harbor Project, that port required the project to fund the "Schools and Related Sites Guidelines for the Port of Long Beach Grant Programs and Healthcare and Seniors Facility Program Guidelines for the Port of Long Beach Grant Programs in the amount of $5 million each."[127]

C. Increasing use of on-dock rail

NRDC-43

The RDSEIR states that "[t]he CS Terminal generates train trips to and from the on-dock rail yard (WBICTF) [West Basin Intermodal Container Transfer Facility]." RDSEIR at 3.1-33. Moving goods via on-dock rail can reduce cargo movements by trucks and cargo handling equipment, mitigate associated emissions, and minimize traffic in neighboring communities. The Final CAAP Update 2017 states that "[o]ver the long term, the Ports will seek to handle 50% of all cargo leaving the port complex by rail." Final CAAP Update 2017 at 73. We support this goal.

The RDSEIR however, indicates that the China Shipping terminal is nowhere near this goal. RDSEIR Table 2-3 indicates that the terminal will utilize less on-dock rail than predicted in the 2008 EIR, and that the percentage of TEUs moved by on-dock rail are far less than the CAAP's 50% goal.[128] The RDSEIR should set forth—as a lease measure—that at least 50% of all cargo handled at the China Shipping terminal utilize on-dock rail. Given the terminal's access to on-dock rail facilities, the Port's larger on-dock rail goals, and CEQA's mandate that all feasible mitigation be considered and adopted for significant impacts, the Revised Project must include on-dock rail as a mitigation measure.

D. Accelerating the turn-over of harbor craft

NRDC-44

The RDSEIR estimates that two tugboats will assist each arrival/departure of a container ship. RDSEIR at 3.1-32. The RDSEIR predicts 156 vessel calls per year in 2030. RDSEIR, Table 2-3. This will generate 624 tugboat assists (4 tugboats x156 vessel calls). The RDSEIR does not consider any measures for this emission source.

At a minimum, the RDSEIR should analyze the measures that the Port is already analyzing in the Final CAAP Update 2017 for harbor craft and consider how such measures can be adopted at the China Shipping terminal.[129] The Final CAAP states:

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[127] Port of Long Beach Middle Harbor Project FEIR at ES-33 (April 2009) (Attachment C12). Long Beach proposed something similar for its proposed (but not adopted) Pier S Project. Port of Long Beach Pier S Project FEIR at ES-35–36 (November 2012) (Attachment C15).
[128] The 2008 EIR predicted 17-20% of TEUs to be moved by on-dock rail between 2015-2045; the RDSEIR predicts 14-15% of TEUs moved by on-dock rail between 2018-2045, with 19-27% of TEUs actually moved by on-dock rail in 2008-2014. RDSEIR Table 2-3 at 2-13.
[129] Final CAAP Update 2017 at 71-72.

NRDC-44

> To stimulate the identification, demonstration, and validation of technologies that can achieve emissions reductions from harbor craft beyond current state and federal regulation, the Ports will seek proposals for harbor craft technologies that have the potential to achieve NOx and DPM emission levels cleaner than Tier 4 standards, or technologies that can be retrofitted to existing harbor craft to achieve Tier 3 or Tier 4 emission levels through the following action:
>
> - Issue a Request for Proposals for harbor craft emission-reduction technologies by December 2017 with demonstrations to begin no later than mid-2018.
>
> . . . Additionally, the Ports propose the following strategies to reduce harbor craft emissions and fuel consumption:
>
> - Provide incentives for harbor craft operators to upgrade to the cleanest available (i.e. Tier 4) engines or low-emission hybrid systems in the short term, and to upgrade with advanced technologies (e.g. fuel cells and alternative fuels) in the long term. Incentives could be given through securing grants from federal, state or local agencies, a formal incentive program with financial rewards, or through more favorable lease terms, where applicable, for harbor craft operators that have cleaner fleets.
> - Identify operational changes that could reduce emissions, for example, by reducing the wait time or slow speed movements of assist tugboats while they are waiting to assist a vessel or by optimizing tugboat berth locations to minimize unnecessary travel.
> - As leases with harbor craft operators are opened or renegotiated, the Ports will assess whether it is possible to include requirements for harbor craft modernization, subject to the requisite negotiation process. Many harbor craft companies operate on private land and do not have leases with the Ports; however, the Ports will seek opportunities as they arise.

Accordingly, for example, the Port should consider issuing an RFP for harbor craft technologies that have the potential to achieve NOx and DPM emission levels cleaner than Tier 4 standards, and that can be dedicated to (or substantially serve) the China Shipping terminal. The RDSEIR should also consider a measure that would offer incentives to harbor craft operators that serve the China Shipping terminal to upgrade to the cleanest available (i.e. Tier 4) engines or low-emission hybrid systems in the short term, and incentives to upgrade with advanced technologies (e.g. fuel cells and alternative fuels) in the long term.

E. Accelerating the turn-over of locomotives

NRDC-45

The RDSEIR indicates that "[t]he CS Terminal generates train trips to and from the on-dock rail yard (WBICTF) as well as near- and off-dock rail yards." RDSEIR at 3.1-33. Further, "[e]missions associated with hauling containers by rail include diesel exhaust from PHL locomotives performing switching activities at the on-dock rail yard, Class 1 switch locomotives performing switching activities at the near- and off-dock rail yards, and line-haul locomotive emissions used during transport within the SCAB and idling at the rail yards. RDSEIR at 3.1-33.

The 2008 FEIR included MM AQ-18 to reduce locomotive emissions, which required, "[b]eginning January 1, 2015, all yard locomotives at Berth 121-131 Rail Yard that handle containers moving through the Berth 97-109 terminal shall be equipped with a diesel particulate filter (DPF)." Mitigation Monitoring and Reporting Program at 2-18. The FEIR committed to incorporating the measure into PHL's (Pacific Harbor Line) lease. *Id.*

Despite the RDSEIR's recognition that locomotives contribute to the project's operational emissions, and Port's history in reducing such emissions from the project (the RDSEIR does not take the position that MM AQ-18 is infeasible),[130] the RDSEIR does not consider any new mitigation for locomotives.

NRDC-45

The RDSEIR indicates that "the active PHL switcher locomotive fleet in 2014 consisted of a combination of Tier 3-plus and genset locomotives and were assumed to be converted to Tier 4 locomotives in future years on a 30-year or 15-year repower schedule, respectively." RDSEIR at 3.1-33. The Port should consider and set forth a mitigation measure that would accelerate the turnover of PHL's switcher locomotives that handle containers moving through Berths 97-100, so that conversion to Tier 4 locomotives happens sooner than 15 to 30 years from now. The Port's previous success in ensuring PHL's locomotives were equipped with DPFs demonstrates the Port's ability to work with other lease holders to secure emissions reductions from the project.

The RDSEIR should also consider measures to reduce emissions from line-haul emissions. The RDSEIR states that the San Pedro Bay Ports Clean Air Action Plan has a goal of ensuring all Class 1 locomotives entering the ports meet emissions equivalent to Tier 3 locomotives by 2023. RDSEIR at 3.1-27. The RDSEIR should have discussed how the Revised Project is consistent with that goal, explained how the Port is working with the railroads to achieve those reductions, and considered ways to, for instance, incentivize or require the use of cleaner locomotive technologies through lease agreements as rail use increases at the China Shipping terminal.[131]

F. The RDSEIR should consider "smart" logistic systems

NRDC-46

In addition to reducing tailpipe and smokestack emissions to reduce operational emissions, the project can also enhance operational efficiencies to reduce air pollution. The RDSEIR should consider smart logistics systems, including but not limited to the Freight Advanced Traveler Information System (FRATIS), which is an intelligent transportation system that analyzes data

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[130] *But see* NRDC Comments on DSEIR (September 29, 2017) at 21 (raising concerns over whether the Port complied with MMAQ-18).

[131] *See* CARB, Technology Assessment: Freight Locomotives (Nov. 2016), *available at* https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf (containing information about cleaner locomotive technologies) (Attachment E11).

from multiple sources to propose the most efficient routes and schedules for drivers, dispatchers and cargo owners.

NRDC-46

We understand that the Port was planning to conduct a demonstration project using FRATIS in late 2017. Final CAAP Update 2017 at 80. The RDSEIR should have discussed the results of this demonstration project and considered incorporating FRATIS or other measures to enhance operational efficiencies and reduce emissions. *See* EPA Comments on Everport DEIR (June 5, 2017) (Attachment E7). Relatedly, the RDSEIR should evaluate the intelligent logistics systems employed at the Port of Long Beach Middle Harbor Project and at the Port's own Trapac terminal, and consider how such systems can be used at the China Shipping terminal.

G. Additional measures

NRDC-47

In addition to the measures described above, the RDSEIR should consider whether there are additional measures that can be adopted to reduce the Project's air quality impacts, including but not limited to measures that reduce emissions generated by refrigerated shipping containers, including methods for plugging such containers into power. The RDSEIR should also consider if there are additional idling restrictions or enforcement measures that can be applied to reduce idling from trucks, locomotives, and harbor craft. *See, e.g.,* Final CAAP Update 2017 at 58-59. In short, the Revised Project must consider measures that can cut pollution from every emissions source operating at the terminal.

IV. The RDSEIR must enhance its mitigation monitoring and enforcement program

NRDC-48

As we explained in our September 29, 2017 comments, the management failures that led to the current China Shipping situation must never recur. Yet, the Port still appears to incorporate the same program that proved ineffective in monitoring and enforcing the 2008 mitigation measures.[132] To ensure that mitigations are actually implemented and monitored for compliance, we reiterate our recommendations:

1. A full public accounting of why the lease with China Shipping was never amended to include the 2008 measures, and why waivers were granted from AMP. A full understanding of what led to the current predicament is essential to ensuring any future mitigation and monitoring program does not repeat past mistakes.

2. Ongoing public disclosure of the status of all mitigation measures for all past and present Port CEQA projects. A third party—agreeable to the Port and the community—should be selected to oversee this monitoring reporting process. The reporting plan should include, at a minimum:

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[132] *Compare* RDSEIR at 3.1-76 to 3.1-78 *with* FEIR Mitigation, Monitoring and Reporting Program at 2-13 to 2-22. Both mitigation monitoring programs primarily consist of the Port including the mitigations in China Shipping's lease agreement.

NRDC-48

- An assessment of mitigation compliance based on on-site visits, interviews, data from the drayage truck registry, and review of equipment and vehicle inventories.

- Throughput tracking to determine if actual throughput exceeds the projections in previously certified EIRs. In years when throughput exceeds projections, an assessment of excess emissions attributable to that throughput should be performed, as well as a plan to deal with those excess emissions.

- Ongoing assessment and implementation of cleaner technologies and practices that can be implemented at the terminals.

3. Creation of a permanent and independent oversight committee, funded to conduct audits of the implementation of all committed mitigation measures, port-wide. The committee could be modeled after the disbanded Port Community Advisory Committee (PCAC). The committee's work should be coordinated with the work of the third-party monitor.

NRDC-49

V. The RDSEIR'S analysis of increased greenhouse gas emissions is legally inadequate and relies on illusory mitigation measures

Climate change is probably the most significant environmental problem that the United States faces. California has led the nation for years in its efforts to fight climate change, requiring deep cuts in greenhouse gas emissions by 2020 and later. Ignoring this, the RDSEIR admits that the revised project will cause an *increase* in greenhouse gas emissions and relies on illusory mitigation measures that, even by the Port's calculation, will not return greenhouse gas emissions to baseline, much less decrease them. This is unconscionable and invalid as a matter of law.

New Table 3.2-3 shows operational GHG emissions for the revised project well in excess of local thresholds of significance for all years through 2045. The accompanying text states:

> Table 3.2-3 shows that the Revised Project's GHG emissions minus the 2008 Actual Baseline would exceed the GHG threshold of 10,000 mty in all of the study years.

These numbers are probably low for the same reasons that the air quality numbers are low. But even so, the Port punts on its legal requirement for GHG mitigation:

> GHG emissions would be significant and unavoidable after mitigation for the Revised Project for every analysis year (2012, 2014, 2023, 2030, 2036). Page 3.2-53.

Indeed, the only mitigation measures proposed are LED lighting and a carbon offset fund, without any restrictions on where offsets may come from. This puny attempt at mitigation ignores what is now feasible at TraPac and Middle Harbor (Long Beach) and in large projects such as the Newhall Ranch development in northern Los Angeles County, which is premised on zero net GHGs and zero net energy. *See, e.g.,* https://netzeronewhall.com/. The China Shipping project and all new Port projects need to meet the zero net GHG standard.

VI. The RDSEIR fails to include mitigation measures suggested by the analysis under Appendix F

NRDC-50

The RDSEIR contains an analysis of the energy conservation factors required to be included under CEQA Guidelines Appendix F. This analysis focuses on the increased use of hydrocarbon fuels, described as diesel equivalent gallons (see page E-4), and is keyed off Port projections of future throughput growth. Not surprisingly, given the Port's failure to commit to zero emission mitigation measures, use of hydrocarbon fuels is projected to grow.

This failure again ignores the portion of Appendix F that requires that: "Alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy." Particularly where mitigation measures are concerned, the Port needs to consider and implement zero emission alternatives for all aspects of the China Shipping operation, including in-yard container movement and intra-port drayage. The goal here should be a zero net GHG and zero net energy facility, not business as usual.

THE DISCRETIONARY DECISION BEFORE THE BOARD OF HARBOR COMMISSIONERS

NRDC-51

For the reasons stated above, the RDSEIR must be revised and recirculated. Once the CEQA document discloses the project's significant effects (including retrospective and prospective impacts), the Board of Harbor Commissioners must adopt all feasible mitigation. This could include enforcing some or all the 2008 EIR's measures, and/or revising the project to add new feasible measures. We have provided a number of technologies the Port must consider, and that are aligned with the City and Port's zero emission goals.

NRDC-52

Again, because the record shows that China Shipping has no interest in complying with the mitigation measures in the 2008 EIR, we recommend that the Board terminate the lease with China Shipping and find a tenant that can comply with CEQA, and partner with the City in fulfilling its zero emission goals. Absent that, it is difficult to see how the Port will comply with CEQA or meet its project objectives to grow the terminal sustainably.

Sincerely,

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Natural Resources Defense Council

David Pettit
Natural Resources Defense Council

Jaclyn H. Prange
Natural Resources Defense Council

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Enclosures:
Index of additional documents supporting these comments
Copies of additional documents

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Index of Attachments in Support of NRDC, et al.'s Comments on the DSEIR for the China Shipping Project (9/29/17) and Comments on the RDSEIR for the China Shipping Project (11/16/18)

Note: Documents added to this index in support of NRDC's comments on the RDSEIR are italicized. All other documents listed in this index were submitted with NRDC's comments on the DSEIR and support both sets of comment letters.

A - Public Records Act Documents

B - China Shipping Litigation and Related Documents

C - San Pedro Bay Port Studies and Assessments

D - City and State Documents

E - Agency Studies and Assessments

F - Academic and Other Independent Studies

G - Rules, Regulations, and Resolutions

H - Miscellaneous Press Statements and News Articles

I - Sonoma Technology, Inc Report and References

J - Press Statements and Data from Technology Manufacturers

K - Sustainable Systems Research, LLC Report

Response to Comment NRDC-1

NRDC's comment letter on the DSEIR is designated Comment Letter 14, and the LAHD's responses to the comments contained therein are presented below.

Response to Comment NRDC-2

The comment is general and does not reference any specific section of the Recirculated DSEIR; therefore, no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)). Subsequent comments presenting specific concerns are responded to below.

Response to Comment NRDC-3

The "analysis by an independent expert" that is summarized in this comment constitutes Comments NRDC.K1-1 through NRDC.K1-7; the LAHD's responses to those comments are provided below. The Recirculated DSEIR does discuss the health effects of the types of air pollutants associated with the Revised Project (Section 3.1.2). The Final SEIR contains a more detailed discussion (Section 3.2.3.1) of the links between air pollutant concentrations and public health.

Response to Comment NRDC-4

The Port is committed to imposing all feasible mitigation on the Revised Project. CEQA does not require that all impacts be reduced to a less-than-significant level by mitigation, but rather that they be mitigated to the extent feasible (see *Sierra Club v. County of Fresno* (2018) 6 Cal.5th 502); certain projects cannot reduce all impacts to a level of less than significant, and lead agencies must decide whether or not to approve the project with a statement of overriding conditions.

With regard to failure to mitigate past, current, and future emissions as a result of non-compliance, refer to Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures.

The LAHD disagrees with the comment's statement that "[t]he Port has not shown that the mitigation measures it adopted in 2008 are now infeasible." The Recirculated DSEIR contains lengthy discussions of the feasibility of each of the mitigation measures considered in the Revised Project, including the feasibility of the original measure (Section 2.5.2.1). The comment's statement shows that the NRDC disagrees with the LAHD's conclusions, but the comment does not contain any factual material to support the statement. Furthermore, the Recirculated DSEIR does consider the additional measures suggested by the comments of NRDC and others to the extent that they are relevant to the Revised Project and are deemed feasible under CEQA.

The Recirculated DSEIR considers zero-emission drayage trucks and finds them infeasible as a measure to be imposed on a single terminal (Section 2.5.2.1). It considers zero-emissions cargo-handling equipment and finds that the types of such equipment that could be deployed at the CS Terminal without extensive, prohibitively expensive modification of the terminal and purchase of new equipment are not yet commercially available or proven for container terminal service (sections 2.5.2.1 and 3.1.4.4, AQ-3; see also Master Response 2: Zero- and Near-Zero-Emission Technologies). It considers OGV engine emission reduction measures and finds that the Port cannot impose specific technologies on OGVs (Section 3.1.4.4, AQ-3). The mitigation measures that constitute the Revised Project will be enforceable by incorporation into the terminal lease. CEQA does not require, and the Revised Project does not include, establishment of a formal system for community oversight of mitigation implementation.

The mitigation measures proposed in the Recirculated DSEIR are consistent with the goals and policies outlined in the 2017 CAAP and with the zero emission goals of the mayor and of the Port. They require the CS Terminal to implement feasible technologies in the near future and commit the terminal to adopting proven zero-emission technologies as those become commercially available and economically feasible.

The statement in footnote 2 that "[i]f TraPac can operate this way under a Port of Los Angeles lease, so can China Shipping" is misleading and untrue. In fact, the zero-emission technologies in use at the Trapac terminal cited by the comment are only possible because of a massive reconstruction of the terminal specifically designed for that purpose and costing several hundred million dollars (the LAHD's cost estimate for a similar reconstruction at the CS Terminal is $396 million, which does not include the costs of new equipment purchase or business disruption during construction). As zero-emission technologies appropriate to the CS Terminal mature and the current-generation of cargo-handling equipment at the CS Terminal becomes due for replacement, the LAHD expects zero-emission technologies to be installed at the CS Terminal, including development of projects to construct the infrastructure necessary to support those technologies.

Please see Master Response 1: Feasible Mitigation – Guidance and Applicability and Master Response 2: Zero- and Near-Zero-Emission Technologies for detailed discussions of the factors that determine feasibility and of the current status of zero emission technologies. Responses to comments about specific mitigation measures are provided below.

Response to Comment NRDC-5

The Port is committed to imposing all feasible mitigation on the Revised Project. CEQA does not require that a supplemental EIR for proposed changes to a previously approved project must assess mitigation to reduce or avoid impacts of the project that occurred prior to approval of the proposed changes. Nevertheless, for informational purposes only, the Recirculated DSEIR does disclose emissions that occurred between 2008 and the present due to incomplete implementation of mitigation from the 2008 EIS/EIR (see Table 3.1-11.) See also Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures and Master Response 5: Comparative Emissions.

The LAHD takes its responsibilities under CEQA and its commitment to sustainable development seriously. While LAHD has moved the SEIR forward with all deliberate speed, NRDC is aware that CEQA analysis for any project takes time and corners should not be cut. Due to the unique issues raised for this project, the SEIR's analysis has been particularly multifaceted, and early on in the CEQA process LAHD disclosed to NRDC that the SEIR could take significant time to complete. Indeed, in recognition of the complex nature of the SEIR, NRDC requested a 60-day extension of the public comment period for review of the Draft SEIR, and the LAHD granted that request, extending the deadline to September 29, 2017.

After the close of the public comment period, LAHD worked diligently to analyze and address the lengthy comment letters received on the SEIR, including NRDC's detailed 63-page letter. To respond comprehensively to the factual and legal questions and concerns raised in the comments on the SEIR, LAHD had to undertake additional analysis of the project and to revise the Final SEIR. Per CEQA Guidelines Section 15088.5, LAHD recirculated a revised Draft SEIR to provide the opportunity for public review of and comment on this new information and analysis. The LAHD received additional comments on the Recirculated DSEIR, including a 48-page comment letter with attached technical analysis from NRDC, and has worked diligently to respond to those comments.

LAHD acknowledges NRDC's plea for prompt completion of the SEIR process, but speed should never come at the expense of good planning and comprehensive environmental analysis. LAHD continues to work diligently to complete the environmental review of the Revised Project and ensure full compliance with CEQA and its public disclosure obligations.

Response to Comment NRDC-6

As explained in section 2.6.1.1 of the Recirculated Draft SEIR, CEQA provides for an EIR to assess the significance of a project's impacts in comparison to a baseline that consists of existing physical environmental conditions at or near the project site. Baseline conditions are normally measured at the time of commencement of environmental review; however, the lead agency has discretion to decide exactly how, and in which time period, existing conditions can most realistically be measured. Furthermore, under CEQA, the purpose of a supplemental EIR is limited to determining whether proposed changes to a previously reviewed project result in environmental impacts that were not already and previously analyzed in a prior EIR. (Public Resources Code § 21166.) Therefore, as discussed in section 2.6.1.1 of the Recirculated DSEIR, a supplemental EIR typically analyzes the impacts of a proposed change to a project compared to a baseline consisting of conditions at buildout of the approved project as analyzed in the prior EIR.

As noted by the commenter, the 2017 DSEIR employed a 2014 baseline, which the DSEIR more precisely defined as "2014 Existing Conditions With Approved Project Mitigation." The DSEIR explained that it employed this "2014 Mitigated Baseline" as the most realistic approximation of China Shipping terminal-buildout conditions that would have existed, at the time of issuance of the NOP for this SEIR (2015), if all mitigation identified in the 2008 EIS/EIR been fully implemented at that time. As further noted by the commenter, in response to comments alleging that the 2017 DSEIR's use of a 2014 baseline ignored the period between project approval in 2008 and 2014, the Recirculated DSEIR employs a modified baseline to identify and determine the significance of the impacts of the Revised Project. The Recirculated DSEIR compares the air quality and GHG impacts of the Revised Project to "2008 Actual Baseline" conditions, based on a determination that in 2008 the terminal was in full compliance with mitigation identified in the 2008 EIS/EIR. Accordingly, the Recirculated DSEIR properly employs as its baseline the conditions as they existed at the earliest possible date before the changes to the previously approved project that are analyzed in this SEIR, i.e., the same year in which the prior EIR was certified and the original project was approved.

The comment asserts, however, that the Recirculated DSEIR is required to use a baseline different from the 2008 Actual Conditions Baseline, on the grounds that CEQA requires disclosure, analysis, and mitigation of "past and future excess emissions." However, this comment misconstrues CEQA. As discussed in Master Response 5: Comparative Emissions, the term "excess emissions" is not employed or defined in the CEQA statute or guidelines, and the SEIR does not use that term in its analysis. The commenter appears to have developed the term "past excess emissions" to mean the difference between actual past project emissions and what project emissions would have been at a particular past time if all mitigation identified in the 2008 EIS/EIR had been fully complied with. The commenter likewise appears to use the term "future excess emissions" to mean the difference between anticipated future emissions under the Revised Project, and what project emissions would have been at a particular future time if all mitigation identified in the 2008 EIS/EIR were to be fully complied with.

For informational purposes only, the Recirculated DSEIR does disclose the emissions that occurred between 2008 and the present by comparing, for 2012, 2014, and 2018, the relative emissions of criteria pollutants under the Revised Project (i.e., incomplete implementation of mitigation measures in the 2008 EIS/EIR) to those under the "FEIR Mitigated Scenario" (i.e., estimated conditions under the previously approved project (see Table 3.1-11). An additional table presenting the difference in annual emissions between the two scenarios has been included in Master Response 5: Comparative Emissions to clarify this issue.

The Recirculated DSEIR also discloses "future excess emissions" by presenting similarly comparable data for 2023, 2030, 2036, and 2045 (see Table 3.1-11). However, the "baseline" necessary to identify those "excess emissions" as significant CEQA impacts would necessarily be a baseline that consists of "FEIR Mitigated Scenario" conditions in a range of different past and future years. For example, to determine the impacts of the Revised Project relative to an FEIR Mitigated Scenario baseline in 2023, it would be necessary to use a baseline of FEIR Mitigated Scenario conditions in 2023, whereas to determine impacts of the Revised Project in 2030 would require comparison to a baseline of FEIR Mitigated Scenario conditions in 2030, and so on. There is no requirement under CEQA for a supplemental EIR, evaluating the impacts of a proposed change to an already approved project, to determine the significance of the impacts of the proposed change by comparison to such a CEQA baseline that fluctuates over time.

Furthermore, as shown in Table 3.1-11, the incremental difference between FEIR Mitigated Scenario emissions and past actual emissions (on the one hand) and between FEIR Mitigated emissions and future emissions of the Revised Project (on the other hand) is often, though not always, considerably smaller than the incremental difference between 2008 Actual Baseline emissions and past/future emissions of the Revised Project. Table 3.1-11 shows that peak-day VOC emissions in 2014 under the Revised Project were 328 pounds per day higher than the 2008 Actual Baseline, and that peak-day VOC emissions under the FEIR Mitigated Scenario would have been 299 pounds per day higher than the 2008 Actual Baseline. The "differences between scenarios" column of that table therefore discloses that peak-day VOC emissions in 2014 under the Revised Project were only 29 pounds per day higher than under the FEIR Mitigated Scenario. Therefore, even if CEQA required comparison of the Revised Project to a fluctuating "FEIR Mitigated Scenario" baseline for purposes of impact-significance determination (which it does not), comparison to such a baseline would generally understate the impacts of the Revised Project, relative to the impacts identified and assessed for significance in the Recirculated Draft SEIR in comparison to a 2008 baseline.

Response to Comment NRDC-7

The commenter's assertion that "the Port…violated its commitments in the…Amended Stipulated Judgment" is unrelated to this SEIR: as stated in the Recirculated DSEIR (Section 2.2.3, p. 2-3), "the ASJ requirements are outside the scope of the Revised

Project and are not considered in this Draft SEIR." The Recirculated DSEIR acknowledges the failure fully to implement some of the 2008 EIS/EIR's measures, including MM AQ-9; the Revised Project addresses the measures that were not fully implemented.

The Recirculated DSEIR discloses, and analyzes for significance under CEQA, impacts of the Revised Project in comparison to the 2008 Actual Baseline, including past impacts of incomplete implementation of mitigation measures from the 2008 EIS/EIR. Additionally, as explained in response to Comment Number NRDC-6, the Recirculated DSEIR also discloses, for informational purposes only, past and future "excess emissions," as that non-CEQA term is used by the commenter. *POET, LLC v. State Air Resources* (2017) 52 Cal.App.5th 52 ("*POET II*"), cited by the commenter, does not require a different treatment of past "excess emissions" in this SEIR. *POET II* is inapplicable, since it did not concern supplemental review under CEQA (*POET II*, at 100.) Rather, that case concerned a first-time project EIR that had been prepared, pursuant to previously issued court order, for a project that an earlier court determined to have been improperly approved without environmental review (See *POET, LLC v. California Air Resources Board* (2013) 218 Cal.App.4th 681 ("*POET I*"). Because the Port, by contrast, properly approved the China Shipping Container Terminal Project based on the 2008 EIS/EIR, and because that 2008 EIS/EIR is conclusively presumed valid as a matter of law, the SEIR properly analyzes the significance of air quality and GHG impacts of the Revised Project in comparison to the 2008 Actual Baseline, consisting of conditions at the time of approval of the original project.

Response to Comment NRDC-8

Please see Responses to Comments NRDC-6 and NRDC-7. As a supplemental EIR evaluating impacts of proposed changes to the China Shipping Container Terminal Project that was approved in 2008 on the basis of the 2008 EIS/EIR, the SEIR is limited under CEQA to evaluating the impacts of changes to the original project. Therefore, the SEIR properly discloses and evaluates the air quality and GHG impacts of changes to the China Shipping Container Terminal Project that occurred in the past during the period of non-compliance or are predicted to occur under the Revised Project. The SEIR properly discloses those impacts in the past, short-term future, and long-term future, by presenting data for a range of study years: 2012, 2014, 2018, 2023, 2030, 2036 and 2045. This analysis fulfills the requirements of CEQA, which contains no requirement that an SEIR evaluate impacts in each individual year in which they may occur and does not require an SEIR to evaluate impacts alleged to have occurred prior to approval of the EIR that it supplements.

Furthermore, the comment claims the Port was in noncompliance with approved mitigation measures for many other years going back to 2000-2001. That statement is inaccurate and conflicts with the commenter's statement in Comment NRDC-7 that the Port violated mitigation measures that were set to phase in between 2004 and 2018.

Regarding footnote 4 ("It is not entirely clear, but it appears that the Port based its evaluation of 2018 on predicted actual compliance with mitigation measures"), Table 3.1-1 of Section 3.1 notes that the analysis for year 2018 under the Revised Project assumes actual compliance levels (i.e. partial implementation) of 2008 EIR/EIS mitigations, combined with projected 2018 terminal throughput. At the time of preparation of the Recirculated DSEIR, the full calendar year 2018 activity was not available, so projections were used.

Response to Comment NRDC-9

Please see Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures, and Responses to Comments NRDC-6, NRDC-7, and NRDC-8. Consistent with the requirements of CEQA, the Recirculated DSEIR properly determines the significance of air quality and GHG impacts of changes to the China Shipping Container Terminal Project in comparison to a 2008 baseline that describes conditions at the time of approval of the original project. There is no requirement under CEQA for a supplemental EIR to instead determine the significance of impacts of a proposed change to an already approved project by comparison to a fluctuating baseline that describes, in a number of past and future years, what the commenter refers to as “what should have happened.” The commenter asks for comparisons that are not only inconsistent with CEQA but also cannot, strictly speaking, be made. As stated in the Recirculated DSEIR (page 2-28), “in the 2008 Actual Baseline, conditions are modelled using current (2018) methodologies and assumptions, since it is not possible to re-create the methodologies, input data, and other assumptions used in the 2008 EIS/EIR. Changes in analytical and modelling techniques, as discussed in sections 2.6.2 and 3.1, since 2008 have made it unworkable or confusing to analyze impacts in this SEIR using data and techniques employed in the 2008 EIS/EIR.”

Nevertheless, for purposes of full informational disclosure, the Recirculated Draft SEIR compares the FEIR Mitigated Scenario (i.e., estimated conditions under the previously approved project) to the 2008 Actual Baseline, using current analytical and modeling techniques, to provide data for an apples-to apples comparison of the Revised Project to the FEIR Mitigated Scenario. The far right-hand column in Table 3.1-11 (“Difference Between Scenarios”) discloses, for each of the past and future study years, the quantified amount by which emissions under the Revised Project did or would exceed (or, in some cases, be less than) emissions under the FEIR Mitigated Scenario. An additional table presenting the difference in annual emissions between the two scenarios has been included in Master Response 5: Comparative Emissions to clarify this issue.

The Recirculated DSEIR thus complies with CEQA’s requirements for assessing the significance of impacts of changes to the previously approved China Shipping Container Terminal Project, and also discloses supplemental information about those impacts, by showing how actual emissions in past years 2008, 2012, and 2018, and future emissions under the Revised Project, compare to what emissions were or would be under the FEIR Mitigated Scenario.

Regarding footnote 5, Recirculated DSEIR Section 3.1.1 and Table 3.1-1 explain the compliance and activity assumptions and data for each analysis year under each Scenario (Revised Project versus FEIR Mitigated). That section delineates how, under the Revised Project, “past years” are based on actual compliance (i.e., partial implementation) of 2008 EIR/EIS mitigations and “future years” are assumed to comply with Recirculated DSEIR proposed mitigations. The analysis cannot “disentangle” past years and future years under the Revised Project as individual scenarios, regardless of their difference in mitigations and compliance, because the HRA analysis relies on the examination of all study years from the 2008 baseline through 2045. The Final SEIR document reiterates these definitions in Chapter 3 Modifications to the Recirculated DSEIR, as relevant.

Response to Comment NRDC-10

Please see Responses to Comments NRDC-6, NRDC-7, NRDC-8, and NRDC-9. The appropriate baseline for a supplemental EIR is conditions at buildout of the approved project as analyzed in the prior EIR. For this reason (and to capture the impacts of past partial implementation of mitigation measures from the 2008 EIS/EIR) the Recirculated DSEIR generally compares the air quality and GHG impacts of changes to the China Shipping Container Terminal Project (including TAC impacts to human health other than cancer risk) to a 2008 baseline that describes conditions at the time of approval of the original project. In the special instance of cancer risk impacts, which are analyzed based on much longer exposure periods than other air quality or TAC impacts, the Recirculated DSEIR determines impact significance by comparison to two 2008 baselines: a 2008 Actual Conditions Baseline that uses 2008 activity levels and 2008 emission factors based on actual compliance with 2008 EIS/EIR mitigation measures at that time, and a "floating Future" 2008 baseline that also uses 2008 activity levels but uses emission factors projected over 25-, 30-, and 70-year exposure periods, to incorporate the future effects of existing air quality regulations. The approach of using two 2008 baselines to assess the significance of cancer risk analysis is conservative, as the floating Future 2008 Baseline describes lower emissions over time than does the static 2008 Actual Baseline, and therefore results in disclosing higher incremental cancer risk impacts. As a result, the Recirculated DSEIR discloses significant cancer risk impacts in comparison to the floating Future 2008 Baseline that would be less than significant in comparison to the static 2008 Actual Baseline alone.

The commenter states that "…the Port should compare what should have happened in past years to what actually happened in those same past years." The Recirculated DSEIR does just that, for informational purposes only, by disclosing the corresponding incremental health risk of both the Revised Project and the FEIR Mitigated Scenario (i.e., estimated conditions under the previously approved project) relative to the 2008 Actual Baseline and the floating Future 2008 Baseline. The FEIR Mitigated Scenario represents "what should have happened", while the Revised Project represents "what actually happened" (although for cancer risk the evaluations span both past and future years because of the 30-year residential and 25-year occupational exposure periods). Therefore, to understand "what should have happened" as compared to "what actually happened/will happen", the reader can compare Table 3.1-20 (what should have happened) to Table 3.1-18 (what actually happened), Table 3.1-21 (what should have happened) to Table 3.1-19 (what actually happened/will happen), and Figure B3-7 in Appendix B3 (what should have happened) to Figure 3.1-2 (what actually happened/will happen).

Note, however, that unlike emissions impacts, the cancer risk impacts of the Revised Project and the FEIR Mitigated Scenario cannot be directly compared, as such impacts are assessed at the particular location of the maximum impact (i.e., Tables 3.1-18 and 3.1-20), and the most-impacted location under one scenario is almost certain to be different than the most-impacted location under the other scenario. This analytical feature, inescapable in assessment of cancer risk impacts, means that even if CEQA required the SEIR to determine impact significance in comparison to the FEIR Mitigated Scenario (which it does not), such a comparison would be confusing and potentially misleading in the instance of cancer risk impact assessment.

Response to Comment NRDC-11

Please see Responses to Comments NRDC-6, NRDC-7, NRDC-8, and NRDC-9. The case cited in the comment, *American Canyon Community United for Responsible Growth v. City of American Canyon* (2006) 145 Cal.App.4th 1062, does not support the commenter's contention that the Recirculated DSEIR is required to compare the impacts of changes to the China Shipping Container Terminal Project to a baseline earlier than 2008, when the original project was approved, nor to a fluctuating baseline consisting of "levels of pollution that would have occurred under the previously approved project" in various past and future years, i.e., the FEIR Mitigated Scenario. That case concerned a project for which supplemental CEQA review should have been prepared but was not. The case does not address the requirements of CEQA concerning the appropriate baseline for supplemental CEQA review.

Response to Comment NRDC-12

Please see Responses to Comments NRDC-6 through NRDC-9 and NRDC-11.

Response to Comment NRDC-13

Please see Response to Comment NRDC-10.

Response to Comment NRDC-14

The purpose of the Recirculated DSEIR is to analyze the continued operation of the CS Terminal under new and/or modified mitigation measures. The Recirculated DSEIR will be used by LAHD, as the lead agency under CEQA, in making a decision regarding actions required to lease and operate the Revised Project. If it is determined that changes to existing mitigation measures are recommended as a result of the Recirculated DSEIR, the Board of Harbor Commissioners will consider amending the lease for operations at Berths 97-109 to include those measures. Accordingly, to determine the impacts of the Revised Project, the Recirculated DSEIR has to analyze the operations under the projected new lease measures.

The comment correctly points out that the actual date for the implementation of the mitigation measures is, for various reasons, uncertain. However, the analyses had to assume some start date in order to proceed, and at the time of SEIR preparation 2019 was a reasonable assumption. CEQA does not require certainty, but instead urges lead agencies to make reasonable assumptions (Public Resources Code § 15384(b)) and use best available data and professional judgment, which is what the LAHD did in this case. It is reasonable for LAHD to assume that the Revised Project will include a new lease with the measures analyzed in the Recirculated DSEIR. Since the comment does not offer an alternative assumption, is general in nature, and does not reference any specific section of the Recirculated SDEIR, no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment NRDC-15

The comment appears to disagree with the Recirculated DSEIR's use of EMFAC2017 to estimate LNG-fueled drayage truck emissions, preferring instead test data from UC Riverside and CARB. Those data were produced by test-cycle protocols that are not speed-specific, meaning that one number would represent a wide range of speeds and therefore engine loads. LAHD disagrees with the use of such data to characterize the emissions of LNG-fueled drayage trucks. In the Recirculated DSEIR, the running exhaust emissions for drayage trucks serving the CS Terminal are calculated on a link-level-specific speed basis for each road link of the network, modeled to represent typical daily routes and speeds. Moreover, the emission factors used in the analysis represent the age distribution of the port-wide drayage fleet in each analysis year, that is, the emission factors take into account emission deterioration effects for each age group of vehicles in the yearly mix. The data cited by the commenter do not include deterioration effects.

The LAHD used the latest CARB approved model, EMFAC2017, for calculating speed-based running exhaust emission rates for drayage trucks operations on the road. EMFAC2017 does not contain assumptions for LNG-fueled heavy-duty trucks; the only LNG-fueled vehicles included in the EMFAC2017 model are CNG-fueled transit buses (CARB, 2018, p. 16), which do not accurately represent the technology and operations of drayage trucks. Therefore, for lack of a better surrogate emission rate, LAHD conservatively assumed that NOx and other pollutants rates, other than diesel-particulate matter (DPM), would be equivalent between LNG-fueled and diesel-fueled drayage trucks. DPM is an essential pollutant evaluated for health risk analysis and it was assumed that LNG-fueled trucks generate 95% lower DPM emissions than diesel-fueled trucks (compression ignition LNG-fuel is typically a mixture of 5% diesel, 95% LNG). As suggested by the commenter, to use test-cycle "emission standards" that represent a wide range of speeds, do not account for deterioration, and are not in units related to real-life activity, such as grams-per-mile, alongside the detailed emission factors that CARB's approved model (EMFAC2017) provides would produce a distorted representation of LNG truck emissions under this analysis.

With respect to OGV emissions for years 2023-2045, the commenter correctly points out that the analysis is unclear. The analysis has been revised in the Final SEIR to present the peak-day emissions for OGVs at berth under the Revised Project scenario for years 2023-2045 without AMP usage, to reflect the difference in mitigation against the FEIR Mitigated scenario peak-day OGV emissions at-berth, which are assumed to use AMP. Please see Response to Comment SCAQMD-26 for more detail.

Response to Comment NRDC-16

The comment is general and does not reference any specific section of the Recirculated DSEIR; therefore, no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)). The comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Response to Comment NRDC-17

Please see Responses to Comments NRDC.K1-1 through NRDC.K1-7 for LAHD's responses to the SSR study. Please see Response to Comment NRDC-15 related to the Recirculated DSEIR's appropriate use of EMFAC emission factors for LNG-fueled engines. Please see Response to Comment NRDC-6 related to the appropriate baseline under CEQA.

The LAHD disagrees with the comment's contention that the Recirculated DSEIR may undercount past emissions by failing to disclose mitigation non-compliance that the commenter speculates may have occurred prior to 2008. First, the SEIR for the Revised Project is not required by CEQA to assess the significance of environmental impacts that are alleged (without evidence) to have occurred prior to certification of the 2008 EIS/EIR. Additionally, as explained in Section 2.2.3 and Table 2-1 of the Recirculated DSEIR, only one of the requirements of the mitigation measures in the 2008 EIS/EIR took effect before 2008; accordingly, it is not possible that non-compliance could have occurred before 2008 in any but that one provision. One provision of MM AQ-17 related to the ASJ (alternative fuel and DOCs in CHE) took effect in late 2004, and that provision was complied with. Accordingly, there are no "excess emissions," as the non-CEQA term is used by the commenter, from years prior to 2008.

Response to Comment NRDC-18

The Recirculated DSEIR does discuss the health effects of the types of air pollutants associated with the Revised Project (Section 3.1.2). The Final SEIR contains a more detailed discussion (Section 3.1.4.4) of the links between air pollutant concentrations and public health. The remainder of the comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)). The comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Response to Comment NRDC-19

Please see Response to Comment SCAQMD-28.

Response to Comment NRDC-20

The comment provides a legal argument regarding CEQA provisions and case law governing mitigation measures, and a summary of the arrangement of the comments that follow in Section II of the commenter's letter. The comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project. Individual responses to each of the comments that are summarized in this comment appear below (see Responses to Comments NRDC-21 through NRDC-39).

CEQA allows for lead agencies, at their discretion, to revise or delete mitigation measures after approval. (See, e.g., *Lincoln Place Tenants Assn. v. City of Los Angeles* (2005) 130 Cal.App.4th 1491, 1508.) To do so, "a governing body must state a legitimate reason for deleting an earlier adopted mitigation measure and must support that statement of reason with substantial evidence. If no legitimate reason for the deletion has been stated, or if the evidence does not support the governing body's finding, the land use plan, as modified by the deletion or deletions, is invalid and cannot be enforced." (*Napa Citizens for Honest Govt. v. Napa County Bd. of Supervisors* (2001) 91 Cal.App.4th 342, 359.) Section 2.5.2 of the Recirculated DSEIR explained in detail why the changes to the mitigation measures were necessary to make the mitigation measure feasible, effective and enforceable. Such substantial evidence would support a determination by LAHD that there is a legitimate reason and good cause to approve the Revised Project.

Response to Comment NRDC-21

The comment summarizes and interprets correspondence between LAHD and applicant regarding the feasibility of mitigation measures in the 2008 EIR/EIS. This is not a comment on the adequacy of the environmental analysis in the Recirculated DSEIR. The comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

Regarding the comment's argument that the "infeasibility arguments are a litigation artifact and not supported by the record," LAHD is not aware of what litigation is referenced in the letter. Section 1.2.4 of the Recirculated DSEIR explains the background of the mitigation measures and the feasibility issues raised by China Shipping during the lease negotiations with LAHD. During this time, China Shipping informed LAHD that it continued to have technical, operational, and practical problems with executing some requirements of the mitigation measures, preventing full implementation of these measures (LAHD, 2017). LAHD reviewed the feasibility information provided by China Shipping, as well as other available information, and determined it would be beneficial to analyze whether the existing mitigation measures have feasibility or other technical, operational, and practical problems hindering full and proper implementation and to identify how the measures could be changed to address such issues. Section 2.5.2 of the Recirculated DSEIR explained in detail why changes to the mitigation measures were necessary to make the measures feasible, effective, and enforceable. Such substantial evidence would support a determination by LAHD that there is a legitimate reason and good cause to approve the Revised Project. CEQA allows for lead agencies, in their discretion, to revise or delete mitigation measures after approval on such grounds. (See, e.g., Lincoln Place Tenants Assn. v. City of Los Angeles (2005) 130 Cal.App.4th 1491, 1508.)

Response to Comment NRDC-22

The comment summarizes and interprets language in Section 1.8.2 of the Recirculated DSEIR regarding the decision-making process of the Los Angeles Board of Harbor Commissioners (Harbor Commission) and the Los Angeles City Council with respect to the Revised Project. The purpose of this section is to provide information to the public and decision makers on the implications if the Revised Project is not approved by the Board of Harbor Commissioners. The Recirculated DSEIR acknowledges that if the mitigation measures are determined to be infeasible, but are not revised, the environmental impacts identified in the 2008 EIR/EIS would not be addressed and certain project objectives would not be implemented. In such a scenario, LAHD nonetheless would still be obligated to ensure compliance with the existing mitigation measures, and, thus, would need to take some further action, outside the scope of this Recirculated DSEIR, to address the problematic situation. This information was intended to provide the decision-makers with an understanding of the implications of their discretionary actions on the Revised Project and the practical or procedural challenges associated with maintaining the status quo, not to suggest, as argued by the comment, that any of the mitigation measures proposed to be changed are, in fact, feasible.

Response to Comment NRDC-23

Please see Master Response 1: Feasible Mitigation – Guidance and Applicability for a discussion of what constitutes feasible mitigation, and Responses to Comments SCAQMD-13, CFASE-5, and CFASE-6 for discussions of compliance with AMP and of alternative at-berth emission control technologies. Please refer to Response to Comment SCAQMD-13 for a discussion of the feasibility of MM AQ-9.

The comment states that "[n]one of the reasons cited in the RDSEIR overcome the presumption that a 100% compliance rate with AMP is feasible" but does not provide evidence or data demonstrating why, in the face of the rationale in Section 2.5.2.1, the commenter presumes that a 100% compliance rate with AMP is feasible. The discussion of infeasibility in Section 2.5.2.1 is not speculative and was based upon factors that would affect the ability of a container terminal to achieve the goal of having 100% of vessel calls use shore power. Table 2-1 of the Recirculated DSEIR demonstrates that 100% AMP or AMP-equivalent compliance has not been achieved for any year between 2008 and 2017, or more recently in 2018 as described in Response to Comment CFASE-5.

The LAHD disagrees that MM AQ-9 as worded in the Recirculated DSEIR "goes backwards' relative to the 2008 wording. The intent of MM AQ-9 is precisely what the comment recommends: that "100% of ships at dock are mitigating at-berth emissions with either shore power *or* an alternative emissions control system" with limited exceptions for specific circumstances. The measure's requirement of 95% compliance only applies to AMP; it does not say that at-berth emissions control need only attain 95% compliance. The measure specifically requires that if AMP cannot be used, alternative control measures must be employed as feasible in the circumstances and to the extent those measures (at present, AMECS and METS-1) are available. Accordingly, the Port expects at-berth emissions control to exceed 95% -- and possibly approach 100% -- of vessel calls because at least some of the vessels that cannot use AMP will be able to use those alternative control measures.

Note that, as stated by the Ports in a joint letter to CARB (POLB and POLA, 2019), an expectation of 100% at-berth emissions control is unrealistic given the currently limited availability of AMECS and METS-1 units, the constraints to deploying both additional shore-power infrastructure and an extensive alternative system, and the likelihood of emergencies and other unforeseen occurrences preventing the use of AMP and alternative systems in the future. Even the comment letter admits that limited exceptions for emergencies should be added if the 100% AMP requirement is retained. The Recirculated DSEIR did not assume 100% compliance in order not to overstate the benefits of MM AQ-9. The reasoning behind these assumptions and expectations is explained fully in Section 2.5.2.1 of the Recirculated DSEIR, Master Response 3: Port-Wide Emission Reduction Programs, and Response to Comment CFASE-5.

The comment claims that the modification to MM AQ-9 in the Recirculated DSEIR is contrary to other port projects because 1) the Middle Harbor at the Port of Long Beach has had a 100% AMP requirement since December 2014 and 2) starting in January 2018, the Port's Trapac terminal will also require 100% AMP compliance. Please note that no other port EIRs have required 100% AMP since those two EIRs were certified in 2009 and 2007, respectively. Since that time, the Port of Los Angeles has certified three container terminal EIRs (APL, YTI, and Everport), all of which contain a 95% AMP requirement. In addition, the MMRP for the Port of Los Angeles Master Plan Update Program EIR contains a 95% AMP requirement for future environmental documents that may tier from the Program EIR. The 95% AMP requirement was established as a feasible and attainable compliance rate for container terminals at the Port. Note that Trapac's 100% AMP requirement, effective as of January 1, 2018, applies to ship hours at berth, not to the number of vessel visits. It is based on the tenant's specific business plan with Mitsui O.S.K. Lines Ltd (MOL), which is TraPac's parent company: MOL had committed to retrofitting its OGVs dedicated to the Los Angeles service with AMP technology (see LAHD, 2007, p. 53).

The commenter claims that the statement "the Port does not have the authority to impose any specific emissions reduction technology on OGVs as they are internationally flagged vessels subject only to IMO regulations" (page 3.1-54 of the Recirculated DSEIR) is inaccurate and contrary to the Port's authority as a landlord to impose lease conditions on its tenants. The LAHD disagrees and believes that the statement in the Recirculated DSEIR is not inaccurate and that it is supported in the 2017 CAAP. The Clean Ship Program as envisioned in the 2017 CAAP (page 67) recognizes that the Ports do not own or operate vessels and thus have few tools to compel the deployment of the cleanest available vessels or impose specific engine requirements. As such, the program will encourage and help accelerate the transition to a cleaner fleet through a future tariff that would charge rates to operators. This approach would be port-wide and would not be the same as imposing a vessel engine requirement through a tenant's lease. See also Response to Comment NRDC-41.

The LAHD disagrees with the commenter's suggestion that failure to implement and enforce 2008 MM AQ-9 in a timely manner itself rendered that measure infeasible under CEQA (citing CEQA Guidelines § 15091), and the commenter supplies no evidence to support that suggestion. The LAHD encourages all tenants to strive for 100% utilization of shore power but recognizes that real-world conditions occasionally prevent achievement of that goal, as described in the discussion of MM AQ-9 in Section 2.5.2.1 of the Recirculated DSEIR. Please see also Master Response 3: Port-Wide Emission Reduction Programs and Response to Comment CFASE-5 for more detail on AMP and other emission control technologies.

Response to Comment NRDC-24

Please see Response to Comment SCAQMD-14 for more detail on VSRP compliance. The comment cites instances in which selected shipping lines achieved 100% compliance with the VSRP during some of the past few years, but none in which all the vessels calling at a single container terminal achieved 100% compliance in both the 20 nm and 40 nm zones during every year the VSRP has been in effect. That is because, as the Port's data on its terminals from 2008 to 2018 show (see Response to Comment SCAQMD-14 for links to the data), there are no such instances. That latter level of performance – 100% compliance throughout the entire 40-mile approach by every vessel in every year -- is what MM AQ-10 as originally worded required (and what the Middle Harbor's measure requires). As the high compliance rates in the VSRP data show, individual shipping lines are clearly making good faith efforts to achieve 100% compliance, but just as clearly are not able to do so consistently at a single terminal. CEQA does not require that mitigation measures require compliance standards that have proven, based on substantial evidence, to be impossible to attain.

The Recirculated DSEIR (Section 2.5.2.1) discusses the reasons why requiring 95% is appropriate, and further points out that the effects on public health and air quality of a non-compliance rate of 5% are negligible. A compliance requirement of 95% is consistent with both POLA practice and the constraints to higher compliance rates discussed in the 2017 CAAP (Section 1.4) and the Recirculated DSEIR (Section 2.5.2.1). Please note that the Middle Harbor terminal's requirement of 100% compliance is a recent development: it is too early to conclude that it represents a feasible measure.

Response to Comment NRDC-25

Revised Project MM AQ-10 as worded in the Recirculated DSEIR requires that at least 95% of vessels calling at Berths 97-101 either comply with the expanded VSRP of 12 knots between 40 nm from Port Fermin and the Precautionary Area or comply with an alternative compliance plan approved by the LAHD for a specific vessel and type, and further requires that the LAHD would have to analyze any proposed alternative compliance plan to ensure that it meets the requirement to "achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP" (Recirculated DSEIR, p. 3.1-81).

The LAHD thanks the commenter for pointing out that an alternative compliance plan, to the extent that it would allow increased vessel speeds, could potentially have unintended consequences such as increased whale mortality from vessel strikes. In light of factual uncertainty on this point, the LAHD has determined to modify Revised Project MM AQ-10 to eliminate the option of compliance via an alternative compliance plan, to avoid the potential for significant adverse impacts of mitigation. Accordingly, MM AQ-10 in the

Revised Project has been revised to eliminate the provision for an alternative compliance plan, and now reads:

Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area.

The modification to Revised Project MM AQ-10 identified above does not raise the potential for an increase to the impacts analyzed in the Recirculated DSEIR, which assumed that 95% of vessels would either comply with the expanded VSRP or follow an approved alternative compliance plan that would achieve comparable or greater emissions reductions. Since the mitigation measure, as modified, will still require 95% compliance, there is no change to the emissions reductions assumed for this measure.

Response to Comment NRDC-26

Please see Master Response 1: Feasible Mitigation – Guidance and Applicability, Master Response 2: Zero- and Near-Zero-Emission Technologies, and Master Response 3: Port-Wide Emission Reduction Programs. Revised Project components related to cargo-handling equipment (MM AQ-15 and MM AQ-17) are directed at ensuring a timely conversion to the cleanest currently available engines. (Note that 2008 MM AQ-16 is combined with MM AQ-17 under the Revised Project because there is no actual distinction between railyard equipment and terminal equipment within WBCT as a whole.)

In addition, MM AQ-17 also requires the CS Terminal to transition to all-electric RTGs in those areas of the terminal that can support them. These measures do not preclude the ultimate conversion of terminal equipment to zero emission technologies, as envisioned by the 2017 CAAP, CARB, and the Mayor; in fact, LM AQ-1 and LM AQ-3 specifically allow for the CS Terminal to make that conversion. However, given the constraints described in the master responses and in Response to Comment NRDC-27, setting a date certain for conversion to zero emissions is not possible, although please note that LM AQ-3 specifically sets forth 2030 as the target date for achieving 100% zero-emissions cargo-handling equipment at the CS Terminal, consistent with the goals of the 2017 CAAP, CARB's 2017 initiative, and the declaration of intent by the mayors of Los Angeles and Long Beach.

The suggestion that the Revised Project include a project plan to install electric infrastructure to support zero emission equipment would expand the project beyond the scope of this SEIR, which is to consider feasible modifications to previously approved 2008 mitigation measures. Nevertheless, LM AQ-3 under the Revised Project does include zero-emission technology demonstration projects, which may set the groundwork for a future proposed project.

Response to Comment NRDC-27

The comment suggests that because zero-emission equipment is operating at the Trapac and Middle Harbor terminals it can readily be employed at the CS Terminal. It is important to note, however, that Trapac and Middle Harbor are the only terminals in the two San Pedro Bay ports that employ substantial quantities of zero-emissions equipment and that they underwent massive physical reconfigurations to accommodate that equipment, which is highly automated and relies on substantial electrical infrastructure. Furthermore, the basis of the comment's statements that "replacing diesel fueled cargo handling equipment with high density automated electrified equipment can result in significant efficiency gains" and "zero emission cargo handling equipment is not only technologically feasible, it also increases efficiencies and profits" is unclear. The comment does not cite productivity or financial data from either terminal, and without such data the claim is unsubstantiated. The comment references a Journal of Commerce article (NRDC comment letter p. 22 footnote 44), implying that the article shows that converting to electrified equipment leads to cost savings, which, in the comment's words, "allows terminals to handle increased cargo volumes". The LAHD believes that statement misrepresents the article, which actually was silent on the subject of productivity and which pointed out that any cost savings would be the result of replacing "dozens of human-operated pieces of equipment with autonomous vehicles"; no mention was made of cost savings due to increased productivity.

Employing those types of equipment at the CS Terminal as a mitigation measure would require a substantial redevelopment of the terminal, with an estimated construction cost of $396 million, to reconfigure the container yard and to install electrical infrastructure and facilities for automated operations (see Master Response 2: Zero- and Near-Zero-Emission Technologies). New equipment purchases and business disruption during the 3-to-five-year construction period would add many millions of dollars more to that cost.

Response to Comment NRDC-28

The comment states that the Port "has failed to explain why "it has delayed installing…electric RTGs in the surcharge area" with the result that the measure was not accomplished by 1 January 2009. The Recirculated DSEIR explained (Section 1.2.4.1) that the LAHD was not able to implement this part of the requirement because the timing of the measure was dependent on a lease approval. However, China Shipping did not agree to an amended lease to incorporate the provisions of the 2008 EIS/EIR, citing a variety of reasons involving costs, operational constraints, and stranded assets. Since the lease approval did not occur, the LAHD had no means of implementing the provisions of MM AQ-17. Accordingly, the Port has had no role in deciding what equipment WBCT chose to purchase and install, including RTGs that did not comply with the requirements of MM AQ-17. The Recirculated DSEIR referenced the correspondence between China Shipping and the LAHD on that issue ("LAHD 2017a"), and copies of that correspondence were provided to NRDC.

The comment is correct in pointing out that electric-powered RTGs are feasible and are commercially available; that is the reason for their inclusion in MM AQ-17 of the Recirculated DSEIR. Since the SEIR process began in 2014, mitigation measures have been under review to determine feasibility. However, because the CEQA process takes time and Board action is required on the SEIR, it is not appropriate to characterize the LAHD as delaying implementation of mitigation that is still subject to approval, such as installing four electric RTGs in the surcharge area or abandoning plans that were being studied in 2014 when the SEIR process began.

However, the comment's assertion that all of the existing RTGs could readily be replaced by electric units is not correct. Contrary to the comment's claim, the Recirculated DSEIR presents a detailed discussion of the constraints to installing electric-powered RTGs throughout the terminal (Section 2.5.2.1, p. 2-19). Briefly, most of the CS Terminal is characterized by short container stacking areas, which makes it necessary for the RTGs to move between stacks, rather than each RTG simply working one long stack. Electric RTGs are tied to their power trenches, so that moving from stack to stack is operationally cumbersome and inefficient. These constraints are the basis for why requiring all electric RTGs, as originally proposed in MM AQ-17 for the 2008 EIR/EIS, is infeasible.

The timing of the terminal design and configuration prior to and during the time of the 2008 EIS/EIR has also played a significant role in the selection of equipment that can feasibly operate at the terminal. As discussed in the 2008 EIS/EIR on page 1-22, the ASJ allowed the Port to complete construction and commence operation of Phase I of the China Shipping Project while the EIS/EIR was under preparation. Phase I construction was completed in 2003, and operations officially began on June 21, 2004 on approximately 72 acres of land encompassing backlands and the wharf at Berth 100. Out of roughly 142 acres total, 72 acres or 50% of the total terminal acreage had already been developed by 2004. The 2008 EIS/EIR (pages 2-1 and 2-14) estimated Phases II and III completion dates as 2010-2011 and 2012, respectively.

During design of the China Shipping Project while the EIS/EIR was underway, the Phase II portion included backland development at the surcharge area and the wharf at Berth 102 encompassing approximately 45 acres. This area was designed with basic infrastructure to support electrical vaults and switch gear because, although electric RTGs had been proposed as mitigation, the specific equipment requirements were unknown at the time the EIR was certified in 2008 and while terminal design was underway. The final Phase III construction was completed in 2013, as explained on page 1-36 of the Recirculated DSEIR, and this southern area includes land along the Vincent Thomas Bridge and Front Street that is approximately 25 acres in size. Figure 2-5 of the 2008 EIS/EIR provides a detailed illustration of the specific terminal areas that were built out in phases. All of these factors taken together serve as the basis for why requiring all electric RTGs at the terminal is infeasible and also answer the commenter’s questions concerning why newer diesel cranes and hybrid cranes were purchased: it was because the terminal not only did not have the necessary electrical infrastructure but also was built out in a manner that made it impossible to allow for a complete redesign while the 2008 EIS/EIR was in process.

Furthermore, the comment’s assumption that because the large, new Long Beach Container Terminal can accommodate electric units, the much smaller and older CS Terminal can as well, is unrealistic. The former was massively redeveloped specifically to accommodate automated, electric-powered cargo-handling equipment, including rail-mounted gantry cranes rather than RTGs, whereas the latter was constructed ten years earlier, before the advent of such equipment, and is not configured to accommodate electric-powered RTGs or RMGs in most of the container yard, as explained in detail above.

As revised in the SEIR, MM AQ-17 requires that electric RTGs be installed in the one area of the terminal that has longer stacks (the “surcharge area”) and that hybrid units (e.g., EcoCranes™), replace the existing RTGs in the remainder of the terminal. Hybrid units are much cleaner than standard diesel units in terms of emissions, and furthermore are the cleanest feasible for this application, and CS indicated in the referenced correspondence that WBCT had purchased five such units (LAHD 2017, letter of March 25, 2015) to work in the non-electrified portion of the container yard.

Response to Comment NRDC-29

Please see Master Response 2: Zero and Near-Zero--Emission Technologies for a discussion of the current feasibility of zero emission yard tractors at the CS Terminal. Please note that the Recirculated DSEIR clearly acknowledges the 2017 CAAP’s goal of converting cargo-handling equipment to zero- or near-zero-emissions by 2030, consistent with CARB's March, 2017 initiative (Section 2.5.2.1, p. 21). MM AQ-15 does not conflict with that goal, since it specifies that replacement yard tractors shall be units that "meet **or are lower than** a NO_X emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants" (emphasis added). Clearly, zero- or near-zero-emission units would meet that requirement. The measure largely addresses the near term and is aimed at accelerating the phase-out of older units.

The comment assumes the project did not meet the alternative fuel requirement for yard tractors until four years after the ASJ deadline in 2004 because the earliest data shown in the Recirculated DSEIR (Table 2-1) is for 2008. Those data are from annual emissions inventories starting with the SEIR baseline year of 2008. The table has been revised to clarify that since 2004, the yard tractors met the ASJ alternative fuel requirement, as reported on page 2-19 of the Recirculated DSEIR and in quarterly reports issued by the LAHD to appellants of the ASJ, including the NRDC.

As to the one-year electric yard tractor pilot project not being implemented and removed from MM AQ-17 without a reason or explanation, the LAHD was not able to implement this part of the requirement because, as stated in the measure, its timing was within one year of lease approval and a lease amendment approval did not occur (see Section 1.2.4.1 of the Recirculated DSEIR.

In addition, the original MM AQ-17's requirement for an electric yard tractor demonstration has been replaced by a more comprehensive requirement in LM AQ-3 that the CS Terminal conduct a demonstration program with at least ten units of zero-emission cargo handling equipment. As pointed out in the master response, demonstration projects are advanced technology tests that have no guarantee of success. Accordingly, mandating those technologies in a mitigation measure could be considered a violation of CEQA, as it could lead to the inability of the Port and its tenant to comply with a measure that subsequently proved to be infeasible or ineffective at reducing an identified impact. As such, it is applied as a lease measure rather than a CEQA mitigation measure as appropriate. Clarifying language has been added to Section 2.5.2.1 (see Section 3.2.2 of the Final SEIR) to explain how the pilot project is replaced by LM AQ-3.

Consistent with WBCT's willingness to participate in a pilot project as pointed out in the comment, the LAHD has been proactively seeking grant funding opportunities for testing and demonstration at WBCT. On April 6, 2018, the California Energy Commission (CEC) notified the LAHD of a grant award by the for "Advanced Freight Vehicle Infrastructure Deployment." Under that program, the LAHD in coordination with WBCT proposes to test 10 zero emission yard tractors at the CS Terminal with wireless "WAVE" inductive charging systems. The grant acceptance requires an agreement with the CEC, which is currently under development and is subject to approval by the Los Angeles Board of Harbor Commissioners.

The LAHD has provided substantial evidence justifying why the original yard tractor engine requirement in MM AQ-15 was not met. As discussed in Section 1.2.4.2 of the Recirculated DSEIR, China Shipping informed LAHD that implementing MM AQ-15 was problematic because it would require replacing, almost immediately, all of the yard tractors originally purchased to meet the first phase of the mitigation measure with remaining useful life, with newer units to meet the second phase of the mitigation measure. This would result in stranded assets of equipment that retain operational usefulness. The details of this problematic situation are set forth in the letters the LAHD received from China Shipping that are cited by the commenter. As initially stated in the February 25, 2015 letter and confirmed in the March 25, 2015 letter, China Shipping and WBCT provided a detailed timeline of when the alternative-fueled yard tractors were purchased to meet the first engine requirement of MM AQ-15. The delivery dates for purchases were in 2004 for 54 units, 46 units in 2007, and then 56 units through July 21, 2008. It is important to note that all 155 yard tractors purchased from 2004 through July 2008 were the cleanest available at that time in order to comply with the ASJ and occurred while the 2008 EIR was still under CEQA review. The ASJ requirement essentially became the first phase of MM AQ-15. The second phase of the mitigation measure, requiring Tier 4 final engines by January 1, 2015, was approved when the EIR was certified on December 8, 2008. The last purchase of 23 yard tractors followed in 2011, and those units met the Tier 4 requirement. The sequence of these events reveals significant issues with the timing and feasibility of the second phase of MM AQ-15 as follows:

1. The oldest units purchased in 2004 still had remaining useful life through 2018, based on WBCT's average use and life expectancy; that means they would still have three years of useful life remaining after the Tier 4 requirement of MM AQ-15 would be in effect. In order to meet the phasing schedule, the Tier 4 equipment would have had to be ordered in advance to be delivered and in use by January 1, 2015. This would add at least another four years of remaining useful life to the oldest units since Tier 4 equipment was not available to purchase until 2011.
2. The above scenario further exacerbates the situation with respect to the operational useful life of equipment purchased in 2007, 2008, and 2011 that would have to be taken out of service.
3. Based on the number of stranded assets that had remaining operational useful life, WBCT would have been required to make monthly payments for the equipment purchases between 2015 and 2020, which is up to five years after the Tier 4 requirement would have been in effect.
4. The estimated cost to replace all 155 yard tractors at once is approximately $17,000,000. As stated in the letter, this expense is not economically or competitively feasible for WBCT or China Shipping.

Based on the record, therefore, the LAHD has provided substantial evidence of the mitigation measure's infeasibility.

With respect to the yard tractor replacement schedule for the Revised Project, changes to MM AQ-15 require replacement of model years 2007 or older no later than one year after the effective date of a new lease amendment. This immediate turnover is tied to the useful life of the yard tractors that are in use at the CS Terminal and could, as the comment suggests, be due as early as 2020. The comment ignores the first phase in and only refers to the second phase of the Revised Project's requirement in MM AQ-15, which calls for replacing model years 2011 or older no later than five years after the effective date of a new lease amendment, which is also tied to the useful life expectancy of the equipment.

The LAHD does not dispute the comment's list of demonstration projects at container terminals in the two ports but points out that all of the projects in that list are currently in progress (see also the review of yard tractor demonstration projects in Master Response 2: Zero- and Near-Zero-Emission Technologies). None has yet to demonstrate that electric yard tractors can, in the long term, meet the duty cycle requirements of the terminals, specifically the ability to work two shifts without recharging (LAHD, 2018; Tetra Tech/GNA, 2019b). Please see Master Response 2: Zero- and Near-Zero-Emission Technologies, for details on the status of zero-emission technology demonstration projects in the port environment. Accordingly, the LAHD disagrees with the comment's assertions regarding the feasibility, availability, and cost effectiveness of electric yard tractors. As described in detail in Master Response 2: Zero- and Near-Zero-Emission Technologies, electric yard tractors are still in the demonstration phase and face substantial challenges related to duty-cycle requirements, the need for and cost of supporting infrastructure, life-cycle costs, and availability from manufacturers.

The Port expects those challenges to be overcome in the future, as described in the 2017 CAAP. Until then, however, the comment's assertion that "Various terminals at both ports are using electric yard tractors in regular operations" with a footnote reference to the 2017 CAAP misrepresents both the situation in the terminals and the CAAP document. In fact, electric yard tractors are not in regular service at any terminal: in every case, including the Long Beach Container Terminal case cited in the comment, they are in demonstration to determine what further development is necessary to make them practicable and economical for large-scale deployment. The 2017 CAAP actually says (p. 51), "Zero-emissions technology also seems promising for traditionally operated yard tractors and top handlers. Both Ports have begun demonstrating electric yard tractors at multiple terminals with nearly 30 such tractors expected to be in testing or full use by the end of 2019." Demonstrations, which constitute all of the examples cited in the comment, are not "regular operations." Nowhere does the 2017 CAAP state or imply that zero-emissions yard tractors are in regular operation at port terminals. As stated several times in these responses, the LAHD believes that it would be irresponsible to require unproven technology in a mitigation measure, given the danger that the measure would be unenforceable.

The LAHD also disagrees with the comment's assertion that the Port must demonstrate that it is deploying Automated Guided Vehicles (AGVs). In the Port complex such vehicles are in use at the Long Beach Container Terminal, but that terminal underwent massive reconstruction to install that technology. AGV technology is totally infeasible for the CS Terminal because the terminal does not have the infrastructure or container yard layout to support AGVs. With respect to hybrid-electric engines, the Revised Project includes as part of MM AQ-17 a requirement for the CS Terminal to convert its RTGs to hybrid-electric units (except for four units that will be all electric). As described in the 2017 CAAP (p. 50) and in Tetra Tech/GNA (2019b), hybrid-electric technology has not been demonstrated to be feasible for other CHE such as yard tractors, and it is unclear whether hybrids can meet the near-zero emissions thresholds.

Response to Comment NRDC-30

Please see Master Response 2: Zero and Near-Zero--Emission Technologies for a discussion of the current feasibility of zero emission forklifts at the CS Terminal. The comment's statement that MM AQ-17 should be "strengthened" to require transition to all-zero-emission units by 2030 ignores the fact that that is what the measure as currently worded does. The Recirculated DSEIR clearly acknowledges the 2017 CAAP's goal of converting cargo-handling equipment to zero- or near-zero-emissions by 2030, consistent with CARB's March, 2017 initiative (Section 2.5.2.1, p. 21). MM AQ-17 does not conflict with that goal, since it specifies that replacements for heavy-duty forklifts shall be units that "meet **or are lower than** Tier 4 final off-road" standards (emphasis added) and that 5-ton forklifts shall be transitioned to electric units within two years of lease amendment. Clearly, zero- or near-zero-emission units would meet that requirement. The measure largely addresses the near term and is aimed at accelerating the phase-out of older units.

The comment is correct in noting that MM AQ-17 does not require zero-emission high-tonnage forklifts. As described in Master Response 2: Zero- and Near-Emission Technologies, the Port's recent study (Tetra Tech/GNA 2019b) verifies that there are no such units currently available; all of the electric forklifts in commercial service are lower-tonnage models. The comment references a demonstration project at the Pasha terminal, but as previously stated, demonstrations are not regular service, and units in such projects cannot be assumed, for CEQA mitigation, to constitute feasible technology. At this time, low-emission units are the only feasible alternative to conventional diesel high-tonnage forklifts; accordingly, the comment is correct in pointing out that MM AQ-17 allows the CS Terminal to continue to invest in diesel technology. The LAHD expects that as the new low-emission units purchased under MM AQ-17 reach the end of their useful service life, the provisions of LM AQ-2, LM AQ-3, and the CAAP will result in their replacement with the then-current technology, which is expected to be zero emission.

With respect to the number of forklifts, the Recirculated DSEIR (Section 2.4.3) is correct in identifying 17 forklifts (9 LPG-fueled and 8 diesel) at the CS Terminal in the 2008 baseline; the comment's tally of 15 units could not be replicated in a review of the Recirculated DSEIR. Furthermore, the Recirculated DSEIR states in Section 2.5.2.1 (p. 2-19) that by 2004, all of the forklifts met the ASJ requirements for emulsified diesel and DOCs. The engine requirements in the original MM AQ-17 that followed in 2009 and 2012 were not met because, as stated in Section 1.2.4.2 of the Recirculated DSEIR, China Shipping informed the Port that replacing cargo-handling equipment, including forklifts, to meet the Tier 4 non-road standard would be prohibitively expensive and require the retirement of units with useful life remaining. As a result, the original MM AQ-17 requirement that applies to forklifts was not met, and, as the comment points out, the CAAP measure CHE-1 in place in 2010 was also not met.

Response to Comment NRDC-31

Please see Master Response 2: Zero- and Near-Zero-Emission Technologies for a discussion of the current feasibility of zero-emission top-picks at the CS Terminal. Note that the Recirculated DSEIR clearly acknowledges the 2017 CAAP's goal of converting cargo-handling equipment to zero- or near-zero-emissions by 2030, consistent with CARB's March, 2017 initiative (Section 2.5.2.1, p. 21). MM AQ-17 does not conflict with that goal, since it specifies that replacement toppicks shall be units that "meet **or are lower than** Tier 4 final off-road" standards (emphasis added). Clearly, zero- or near-zero-emission units would meet that requirement. The measure largely addresses the near term and is aimed at accelerating the phase-out of older units. LM AQ-1 and LM AQ-3 provide the mechanism whereby zero-emission units would be incorporated into the CS Terminal as they become feasible technology.

The comment asserts that the Port failed to explain why the Tier 1 toppicks were not replaced in 2016 based on letters received during the SEIR process. Since the SEIR process began in 2014, mitigation measures have been under review to determine feasibility, and letters such as those pointed out by the commenter serve as evidence for revising MM AQ-17. However, because the CEQA process takes time and Board action is required on the SEIR, the LAHD is not able to implement this mitigation prior to

Board action or to enforce such a requirement without a lease amendment approval. With respect to electric toppicks, the comment suggests that existing toppicks should be replaced with electric units, but correctly characterizes the current status of those units as demonstration projects; Tetra Tech/GNA (2019b) confirms that zero-emission toppicks have not yet demonstrated commercial and technical feasibility. As pointed out in the master response, demonstration projects are advanced technology tests that have no guarantee of success. Accordingly, mandating those technologies in a mitigation measure could be considered as a violation of CEQA, as it could lead to the inability of the Port and its tenant to comply with a measure that subsequently proved to be infeasible.

The comment cites a letter from China Shipping to the Port in 2015 in which China Shipping indicated that eight top handlers with Tier 1 engines could be replaced in the near future. Please note that in that letter China Shipping did not specify the emissions level of the replacement units and given the lack of a lease containing MM AQ-17, the Port had no means of ensuring that replacement units would be the cleanest available. Considering that fact and the infeasibility of zero- and near-zero-emissions units at that time (and even now), there is no justification for assuming that replacement units would even meet, let alone exceed, the requirements of MM AQ-17.

Response to Comment NRDC-32

Please see Master Response 2: Zero Emission Technologies for a discussion of the current feasibility of zero emission sweepers and shuttle buses at the CS Terminal. Note that the Recirculated DSEIR clearly acknowledges the 2017 CAAP's goal of converting cargo-handling equipment to zero- or near-zero-emissions by 2030, consistent with CARB's March, 2017 initiative (Section 2.5.2.1, p. 21). MM AQ-17's requirement for shuttle buses would clearly result in an all-electric fleet before 2030. With respect to sweepers, the measure largely addresses the near term and is aimed at accelerating the phase-out of the two old units. One unit is model year 2005, the other 1995, and neither unit meets USEPA Tier 4 engine standards.

The comment points out that the Recirculated DSEIR does not explain which of the original mitigation measures it is relaxing with respect to sweepers and shuttle buses, nor does it assess compliance rates. As shown in Table 2-1 of the Recirculated DSEIR, MM AQ-17 in the 2008 EIS/EIR did not specifically call out requirements for shuttle buses and sweepers because the mitigation was developed for cargo handling equipment operating on the terminal in order to be consistent with CAAP measure CHE-1 that was in place at that time (see page 3.2-71 of the 2008 Draft EIS/EIR). Rather than relaxing the measure, as the commenter claims, the LAHD has actually strengthened MM AQ-17 by including this equipment and requiring the cleanest available sweeper units and zero-emission shuttle buses. The requirement for low-emission sweepers recognizes the fact that, as described in Response to Comment CFASE-12, there are no zero-emission heavy-duty sweepers available; the electric model available is a light-duty parking lot sweeper that could not fulfill the CS Terminal's requirements. Furthermore, there is no compliance data on this equipment because, as mentioned above, MM AQ-17 did not specify any requirements and no such equipment was analyzed or considered in the air quality analysis for the project in the 2008 EIS/EIR.

Response to Comment NRDC-33

CEQA requires that mitigation measures must feasibly reduce or avoid significant impacts. All currently feasible mitigation measures for significant impacts in the areas of air quality, greenhouse gas emissions, and transportation are identified as "mitigation measures" ("MMs") in the Recirculated DSEIR. Lease Measures LM AQ-1 and LM AQ-3 are not identified in the Recirculated DSEIR as mitigation measures, nor are they intended as substitutes for feasible mitigation measures under CEQA. As such, these lease measures are separate from CEQA, and are not subject to the requirements that CEQA places on mitigation measures, including requirements of specificity. Rather, they are proposed as supplements to CEQA mitigation measures, as a means of introducing additional, currently infeasible zero- and low-emission impact-reduction technology, when and if it becomes feasible in the future. The nature and efficacy of currently unavailable impact-reducing technology that may later be determined feasible and introduced under these lease measures is not yet known. Therefore, the Recirculated DSEIR does not quantify or otherwise characterize the amount or degree of impact-reduction that may result from theses lease measures.

Response to Comment NRDC-34

With regard to the feasibility of requiring zero-emission trucks to service the CS Terminal, please see Response to Comment SCAQMD-11. In addition, the comment speculates on potential uses of electric drayage trucks in short-haul port service (e.g., to move containers between terminals and peel-off yards or near-dock railyards). As with a blanket requirement, those specific uses cannot be imposed on a terminal-specific basis because the terminal has no control over the trucks that move cargo through its gates. The Port is exploring the feasibility of devoting a zero-emission drayage operation to short hauls within and near the harbor but that is a port-wide, not a terminal-specific, solution that has not yet been determined to be practicable.

The comment mentions several programs in which electric trucks "are being developed and tested now in Los Angeles and Long Beach, supported by massive amounts of grant funding" and asserts, without evidence or data, that "longer drays will soon be possible with equipment from Volvo, BYD and others, and the Port should require China Shipping to commit to their use." However, the LAHD points out that a mitigation measure cannot be imposed on a mere expectation of feasibility and that this particular measure cannot be imposed on a single terminal for the reasons described in detail in the Recirculated DSEIR and the Drayage Truck Study.

The comment correctly points out that the Recirculated DSEIR assumed that the percentage of LNG trucks in the drayage fleet is "likely increasing in future years." In fact, as described in the most recent analysis of the drayage truck industry (Tetra Tech/GNA 2019a), the percentage has decreased in recent years from a high of approximately 8% in 2013 to approximately 3% in 2018 as trucking companies terminate leases and sell older LNG units in favor of new conventional diesel units meeting the CTP's requirements. Stronger engines in newer LNG-fueled units are likely to maintain LNG-fueled heavy-duty trucks in the drayage fleet, but the comment's assumption that their percentage of the fleet will increase above its historic high is speculation (as was the statement in the Recirculated DSEIR).

Response to Comment NRDC-35

The LAHD disagrees with the assertion that the LNG truck measure is and was feasible. Please see Response to Comment SCAQMD-11. MM AQ-20 was developed in the expectation that LNG trucks would be become widely available and economically feasible to operate (with subsidies from the ports and CARB) because pilot program results were encouraging. In short, MM AQ-20 imposed an unproven technology on a single marine terminal. As explained in detail in the "Assessment of the Feasibility of Requiring Alternative-Technology Drayage Trucks at Individual Container Terminals" (referenced in the Recirculated DSEIR as LAHD 2017 and hereinafter the "Drayage Truck Study") and summarized in the Recirculated DSEIR's discussion of MM AQ-20 (p. 2-22 – 2-24), LNG trucks never became a large enough component of the drayage truck fleet to have enabled them to haul 100% of China Shipping's cargo. In addition, as the Drayage Truck Study describes, China Shipping did not, and does not, control which trucks haul cargo coming through the CS Terminal, and trying to do so, for example, by turning away non-LNG trucks at the gate as suggested in the comment, would result in a competitive disadvantage, possibly financially ruinous, as shippers turned to cheaper and less restrictive terminals.

The comment cites the case of the SCIG project, and although that project did contain a low-emission drayage truck requirement, the comment misrepresents the case. That project was fundamentally different from the China Shipping case in that BNSF (the SCIG facility's owner and operator) does contract for drayage and would therefore be able to control the drayage fleet servicing its facility. Furthermore, the requirement (MM AQ-8) was not for "LNG-equivalent trucks," as stated in the comment, but rather for trucks meeting "an emission reduction in diesel particulate matter emissions (DPM) of 95% by mass relative to the federal 2007 on-road heavy-duty diesel engine emission standard ("low-emission" trucks)" (LAHD, 2013c, p. 2-9). Finally, the measure did not require all trucks to meet the low-emission standard, but instead incorporated a phase-in schedule that gradually increased the proportion of low-emission trucks to a maximum of 90% in 2026 and beyond. Accordingly, MM AQ-8 of the SCIG project represented feasible mitigation whereas MM AQ-20 of the China Shipping project did not.

LNG-fueled drayage trucks were conceived at the time as the best possible approach to reducing drayage truck emissions, but they turned out not to be successful at achieving that goal. The NRDC itself specifically acknowledged the failure of the LNG truck effort: Mr. David Pettit of the NRDC was recently quoted as saying, *"It was a huge experiment with public money, well meaning, and it didn't work. This is public money going to private industry to clean up the air pollution that private industry is causing. A lot of money was essentially wasted on subsidizing LNG trucks that were not successful in operation."* (KPCC, 2017).

Instead, as the NRDC acknowledges in comment NRDC-37, the solution is a port-wide approach. The 2017 CAAP promulgates that approach in its outline of the proposed update to the Clean Truck Program (Section 1.1). The update will include measures mentioned in the comment (operational and financial incentives for clean trucks and financial penalties for non-zero-emission trucks) as well as other measures aimed at ensuring the operational and financial sustainability of zero-emissions trucks in the drayage industry. The 2017 CAAP addresses the numerous and complex issues involved in effecting a multi-billion-dollar change in a highly competitive industry with narrow profit margins and a fraught labor environment, and recognizes that the change will require a huge effort on the part of many stakeholders and will not happen overnight at a single marine terminal.

Response to Comment NRDC-36

Please see Master Response 2: Zero- and Near-Zero-Emission Technologies for a discussion of the feasibility and current status of zero-emission drayage trucks and Response to Comment NRDC-34 regarding short-haul drayage. The LAHD does not disagree with the comment's assertion that zero-emission drayage trucks are currently available for short-haul applications, although we note that all of the comment's examples, taken from a recent SCAQMD publication, are of demonstration and pilot projects or various efforts characterized as being in the future (e.g., "BYD will develop…"; "… trucks will be designed…"; "Kenworth will develop…"). Battery-electric trucks suitable for short hauls are likely to become generally available in the near future, as the 2017 CAAP acknowledges (Section 1.1 p. 47). When that occurs, the Ports, through the Clean Truck Program update outlined in considerable detail in the 2017 CAAP, will facilitate their introduction, including conducting a pilot deployment program that is already underway, providing financial incentives and near-terminal container handling facilities suited to short-haul drayage, and installing charging infrastructure.

Note, however, that the 2017 CAAP envisions a port-wide effort on the part of both ports. Imposing zero-emission drayage, short-haul or otherwise, on a single terminal is infeasible because, as explained in the Drayage Truck Study and acknowledged by comment NRDC-37, individual terminals have little or no role in or influence over the drayage industry, which is managed by other parties. Changes in the port drayage industry must be effected on a regional basis in order to ensure a level playing field for all parties – terminals, trucking companies, cargo owners, shippers, and the various supporting entities. For that reason, the Revised Project does not include MM AQ-20, which attempted to impose a trucking measure on a marine terminal.

Response to Comment NRDC-37

The LAHD agrees that the solution to the feasibility of requiring 100% LNG trucks is port wide. Please see Responses to Comments NRDC-35 and NRDC-36. The Recirculated DSEIR does, in fact, acknowledge that both ports are on a path to achieve zero-emissions drayage trucks by 2035 through the 2017 CAAP (Recirculated DSEIR p. 2-24). The comment states that the Port did not analyze "that," presumably referring to the joint mayors' proclamation regarding a port-wide drayage solution. That proclamation was incorporated into the 2017 CAAP, which, as explained above, the Recirculated DSEIR acknowledged. It is unclear what additional analysis the commenter envisions, and without additional detail no further response is possible.

Response to Comment NRDC-38

The LAHD disagrees that the priority access system required in LM AQ-2 should be limited to zero-emission trucks. Such a restriction would have the disadvantage that it would not reap any rewards in terms of emissions for a number of years since, as described in the 2017 CAAP, zero-emission trucks are unlikely to be numerous in the drayage fleet before 2024, when they are expected to comprise no more than 14% of the fleet (2017 CAAP p. 42). It is unlikely that priority access systems at marine terminals would significantly affect the penetration of zero-emission vehicles into the drayage fleet; the more likely drivers of change will be financial incentives to purchase those vehicles, the number of vehicles available for purchase, the development of charging and maintenance infrastructure, and the observed operating costs. On the other hand, near-zero-emissions trucks are expected to be widely available (2017 CAAP p. 42), and the presence of priority access systems at marine terminals would add an incentive to those already envisioned in the Clean Truck Program update described in the 2017 CAAP. If those trucks could not take advantage of a priority access system, then the emissions benefits of reduced in-terminal idling times would not be realized and an incentive, however small, for their incorporation into the drayage fleet would be lost.

Response to Comment NRDC-39

The LAHD disagrees that LM AQ-23 should be retained simply because "the Port has never claimed it is infeasible." The LAHD stands by its conclusions in Section 1.3 of the Recirculated DSEIR that the Revised Project would eliminate some measures that have proved to be unnecessary and that periodic throughput tracking reviews are unnecessary because: 1) LM AQ-22, which requires periodic review of new technology, is still in effect; and 2) the Revised Project includes LM AQ-1 and LM AQ-3. These initiatives will ensure that new technologies are incorporated into terminal operations as they become available. Since these technologies would represent the best available emissions reduction measures, they would be identical to the mitigation measures that would be identified if throughput tracking and subsequent air quality analysis were to identify additional impacts. Accordingly, LM AQ-23 would not result in any mitigation measures that would not be implemented through LM AQ-1, LM AQ-3, and LM AQ-22.

Response to Comment NRDC-40

In compliance with CEQA and as addressed in detail in Section 2.5.2.1 of the Recirculated DSEIR, the Revised Project comprises all feasible replacement mitigation measures for significant impacts of the China Shipping Container Terminal Project. It replaces certain 2008 EIS/EIR mitigation measures that LAHD has determined are infeasible or no longer necessary and determines based on substantial evidence that no further or additional feasible mitigation is available for those impacts, or for the impacts of the Revised Project. CEQA does not require that a supplemental EIR for proposed changes to a previously approved project assess mitigation to reduce or avoid impacts of the project that occurred prior to approval of the proposed change. Nevertheless, for informational purposes only, the Recirculated DSEIR does disclose emissions that occurred between 2008 and the present due to incomplete implementation of mitigation from the 2008 EIS/EIR (Table 3.1-11.) See also Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures.

Response to Comment NRDC-41

The 2008 EIS/EIR's mitigation measure MM AQ-13 Reroute Cleaner Ships remains applicable as approved based on the 2008 EIS/EIR and is not part of the Revised Project in this SEIR. Nevertheless, the commenter suggests that because the Port and the CS Terminal are in compliance with this measure, the SEIR should consider a similar measure that encourages the rerouting of Tier 2 and Tier 3 vessels to the CS Terminal. The commenter suggests that in its consideration the Port should take into account the 2017 CAAP's projections of the future vessel fleet to establish percentages and deadlines for the measure.

The commenter is correct in pointing out that ships have been getting cleaner and that MM AQ-13 has been complied with. Emissions inventory data showed that in 2013 all vessels operated by China Shipping that called at the CS Terminal were Tier 1 and that in 2014 more than half of the vessels were Tier 2. Data from 2015 to 2018 confirm that all of the vessels calling at the CS Terminal have been a mix of Tier 1 and Tier 2 vessels meeting the requirements of MM AQ-13. This trend towards cleaner vessels is primarily due to the timing of the IMO Marine Engine Regulations coming into effect and the natural phase-out of older smaller ships.

Nevertheless, the LAHD disagrees with the commenter's suggestion for a number of reasons. First, the projections in the 2017 CAAP are based on a number of assumptions regarding the complex of economic, business, and technical factors that will drive the composition of the world fleet (see 2017 CAAP Section 1.7). Given how far in the future those projections are, they must be regarded as speculative estimates, not as firm predictions of the numbers of Tier 2 and Tier 3 vessels in the fleet or the dates when given percentages of those tier levels will be in service. The 2017 CAAP points out that vessel owners are under no obligation to purchase Tier 3-equipped vessels in the foreseeable future, given the substantial backlog of uncompleted Tier 2 vessels available to them. This means that there is no certainty regarding deployment of Tier 3 vessels in service to San Pedro Bay, as indicated by the total absence of such vessels from Table 7 (Forecasted Vessel Arrivals to San Pedro Bay in 2025 by Engine Tier and Vessel Type) of the 2017 CAAP. As the 2017 CAAP states (p. 70) "it is impossible to predict what the shipping industry will look like in 2025." Accordingly, imposing a mitigation measure that mandates certain percentages of Tier 3 vessels by certain dates would be unrealistic and unjustified by any data.

Second, please note that MM AQ-13 is still in effect, and it already provides a framework for encouraging the cleanest vessels to call at the CS Terminal by specifying that "75 percent of all ship calls…meet IMO MARPOL Annex VI NOX emissions limits for Category 3 engines." There are three tiers of IMO emission limits for category 3 marine engines: Tier 1 became effective in 2000 (applies to vessel engines with keel laid dates of 2000 to 2010); Tier 2 became effective in 2011 (applies to vessel engines with keel laid dates of 2011 to 2015); and Tier 3 became effective in 2016 in Emission Control Areas. Accordingly, MM AQ-13 is still applicable because regulations are in place that address the future fleet; to the very limited extent either the CS Terminal or the Port can influence vessel scheduling, MM AQ-13 would guide those efforts.

Third, given how shipping alliances operate, sharing vessels and terminals, the issue of container vessel engine types is best approached on a bay-wide basis rather than a terminal-by-terminal basis. As alluded to above, the Ports do not own or operate the vessels and terminal operators do not control the deployment of specific vessels to their terminals. Accordingly, a mitigation measure targeting a particular terminal in a particular port has little power to affect the operator of a vessel fleet deployed worldwide. A more effective approach is for major ports – and even whole countries -- to exert pressure in the form of port incentives and taxes (as Norway has done to encourage LNG-fueled vessels). This is the approach proposed in the 2017 CAAP (p. 68): to "[i]mplement a variable rate on ships according to engine tier level to encourage calls by cleaner ships and to discourage older ships. A higher rate would be applied initially to Tier 0 ships, later adding Tier 1 ships, and would begin no earlier than 2025. Any collected funds would be used to provide incentives directed at reducing emissions from ships."

Finally, the commenter offers no suggestions for how, in the absence of firm data on the availability of Tier 3-engine-powered vessels, the feasibility assessment of a proposed mitigation measure would attempt to develop a phase-in schedule or percentages. Lacking such specifics, the LAHD concludes that the suggestion is infeasible and no further response is required.

Response to Comment NRDC-42

LAHD is committed to addressing the overall off-Port impacts created by Port operations on surrounding communities and their residents. The Harbor Community Benefit Foundation (HCBF) is a nonprofit organization that administers the Port Community Mitigation Trust Fund (PCMTF). The PCMTF was established in 2008 by a Memorandum of Understanding (MOU) to settle appeals of certification of the Berths 136–147 [TraPac] Container Terminal Project Final EIS/EIR. Exhibit B of the MOU established a list of specific Port expansion projects for which LAHD would contribute to the PCMTF if implementation of the project would occur within the coverage dates of the MOU. Any EIR not certified by May 2016 falls outside of the effective coverage date of the MOU and is not required under the MOU to make a contribution to the PCMTF. Although LAHD will not be contributing to the HCBF as a result of the Revised Project, it is important to note that LAHD contributes 10 percent of its operating income annually in local public infrastructure improvement projects. This amount of money equates to approximately $22-$25 million per year. In addition, LAHD annually contributes another approximately $20 million to public programs and public access projects.

With respect to funding mitigation projects outside the Harbor District, absent the TraPac MOU, please see Response to Comment CFASE-14. Please note that the Port already supports the Technology Advancement Program at an annual level of up to $1,500,000 (up to $3 million total from both Ports), which results in substantial off-Port benefits to the community in terms of emission reduction.

Response to Comment NRDC-43

The suggestion that the Port should require the CS Terminal to send at least 50% of its cargo via on-dock rail is inconsistent with the realities of goods movement and mischaracterizes a port-wide goal stated in the CAAP. Cargo destinations and means of transport are set by the beneficial cargo owners and the shippers. Neither the CS Terminal nor the Port have any control whatsoever over either of those factors. If less than 50% of a terminal's cargo is bound for inland destinations served by rail (so-called inland point intermodal, or IPI, cargo), then a lease measure requiring at least 50% on-dock would be impossible to comply with.

Approximately 22% of the CS Terminal's cargo is intermodal: in 2014 the terminal handled a total of 1,088,639 TEUs, but only 264,000 TEUs left the region on trains (208,000 on-dock, 56,000 at the ICTF and the downtown railyards); the remainder went to local destinations by truck. It is true that the 2017 CAAP envisions a distant future in which up to 50% of all cargo port-wide will leave the port complex by rail, but the actual goal is to be able to accommodate 35% of cargo on trains, and that goal has no schedule and is not specific to any individual terminal (2017 CAAP p. 73). Furthermore, those numbers will only occur if a greater percentage of the cargo coming through the ports is not local, but is instead IPI cargo.

Finally, please note that the Port cannot dictate cargo transportation modes on a terminal-by-terminal basis. The Port's role in increasing the use of on-dock (and near-dock) rail for intermodal cargo is restricted to ensuring that terminals have adequate access to in-terminal or nearby intermodal facilities, that the Port's rail network can handle the rail traffic, and that necessary intermodal facilities are permitted as appropriate.

Response to Comment NRDC-44

Please see Master Response 3: Port-Wide Emission Reduction Programs for a description of the measures related to tugboats and other harbor craft that have been and are being developed by the Port, tugboat companies, and local and state government. The comment's suggestion that harbor craft control measures should somehow be the responsibility of a single marine terminal to implement is inconsistent with the realities of maritime activities. Tugboats are contracted by shipping lines, not marine terminals, to assist vessels entering and leaving the Port. The CS Terminal does not and could not have any authority over which tugboats assist which container vessels.

The LAHD agrees, however, that tugboat emissions are an important source that needs to be addressed. Like drayage trucks, however, harbor craft emissions are a problem that requires a port-wide approach, as outlined in the 2017 CAAP, rather than a terminal-by-terminal approach. The CAAP measures that the comment summarizes will be applied to the entire suite of harbor craft, not just those that serve the CS Terminal, and will substantially reduce harbor craft emissions. Requiring implementation of those measures at a single marine terminal is not practical: the incentives and emission standards that the comment suggests be targeted on the CS Terminal are actually going to be applied port-wide; the port-wide approach will make any measures that specifically target the CS Terminal redundant and irrelevant.

Response to Comment NRDC-45

Please see Master Response 3: Port-Wide Emission Reduction Programs for a description of the measures related to railroad locomotives that have been and are being developed by the Port, railroad companies, and local and state government. The comment correctly points out that the harbor rail switching entity, Pacific Harbor Line (PHL) has made great progress in upgrading its fleet to the lowest feasible emissions. In fact, PHL's fleet is currently the cleanest in the country and is actively converting to Tier 4-engine-powered locomotives (2017 CAAP p. 74). The ports are seeking funding to support the development of the next generation of switch locomotives: near-zero and zero-emission units, and have committed through the 2017 CAAP to promote the development of Tier 5 engine standards for locomotives (2017 CAAP p. 30).

Given the fact that switching (and line-haul) locomotives are active throughout the port complex, the solution to locomotive emissions, like the solutions to drayage truck and harbor craft emissions, is port-wide, not terminal-specific. Previous Port environmental documents, including the 2008 EIS/EIR, have attempted a terminal-by-terminal approach to locomotive emissions, but substantive adoption of cleaner technologies and emission reductions has come through the implementation of the port-wide measures in the various iterations of the CAAP and, in the case of line-haul locomotives, by state and federal initiatives. As pointed out in the comment, the 2010 CAAP Update included rail measure RL-2 with a goal of Class I locomotives meeting Tier 3 standards by 2023. The comment ignores the fact that the 2017 CAAP Update now focuses on freight infrastructure to maximize the use of on-dock rail, as explained in Response to Comment NRDC-43. Furthermore, the Recirculated DSEIR (Section 3.1.4.4) considers the applicability of previous CAAP rail measures, including RL-2, and concludes that the LAHD is pre-empted by federal law from requiring or mandating that private rail companies operate certain types of locomotives within the Port.

Response to Comment NRDC-46

Please see Response to Comment SCAQMD-23 for a summary of current programs aimed at improving the efficiency of terminal operations, including truck activities, using "smart" logistic systems. The comment suggests FRATIS as one example and claims that the results of the demonstration project using FRATIS at the Port should have been discussed and considered in the SEIR. FRATIS is a trucking logistics system that is currently in the early stages of development and involves a 12-month demonstration project that is limited to ten trucks. Results of that demonstration project will likely not be available until mid-2020 and would be evaluated at that time by the drayage industry to determine its suitability. Regardless of the outcome of the demonstration project, the Port would not determine its use or deployment; that decision would be made by the drayage industry.

The Port does not dictate use of a specific operating system because terminals differ with respect to configuration, cargo types, and operating modes, such that each terminal must determine for itself the logistics system that best suits its needs. Requiring the CS Terminal to use, for example, FRATIS is not appropriate because that system is actually used by trucking companies for their operations, which they schedule directly with individual terminal operators. As previously mentioned, each terminal operator must determine the logistics system that best suits its needs; therefore, suggesting that the CS Terminal employ intelligent logistics systems that are in use at the Port of Long Beach's Middle Harbor or the Port's TraPac terminal is also not appropriate as a measure for this SEIR.

Response to Comment NRDC-47

The Recirculated DSEIR has considered all of the mitigation measures that can feasibly be applied to a single container terminal. The suggestion that refrigerated containers could be plugged into electrical outlets would not apply to the Revised Project because the WBCT already has plug-in stands for refrigerated containers (http://wbct.us/about-us/terminal-services/wbct-maintenance/). The 2008 EIS/EIR already contains mitigation measure MM AQ-21 for truck idling that is not being modified as part of the Revised Project for this SEIR. Constraints to imposing measures related to trucks (beyond limiting idling), locomotives, and harbor craft are described in Responses to Comments SCAQMD-11, NRDC-35, NRDC-43, NRDC-44, and NRDC-45. Without specific suggestions regarding other potential measures, no further response is required (PRC 21091(d); CEQA Guidelines Section 15204(a)).

Response to Comment NRDC-48

This is not a comment on the adequacy of the Recirculated DSEIR. As described in more detail in Response to Comment CSPNC-1, none of the elements requested – a discussion of the past, disclosure of the mitigation status of other projects, or formation of a committee to oversee port-wide compliance – is either within the scope of this SEIR or required by CEQA. Please note, however, that sections 1.2.3 and 1.2.4 of the Recirculated DSEIR already describe in adequate detail the background of the Revised Project, including the status of the lease with China Shipping and the reasons why some mitigation measures were not complied with.

Per CEQA, LAHD will adopt a mitigation monitoring and reporting program designed to ensure compliance with mitigation measures during the implementation of the Revised Project. CEQA does not mandate specific requirements for the program, but rather provides substantial flexibility to lead agencies, such as LAHD, to adopt monitoring and reporting programs and tailor them to specific projects. There is no requirement under CEQA that LAHD must provide a full public accounting of past activities at the Project site, disclosure the mitigation and monitoring status of other projects or form a committee to oversee Port-wide compliance. Nonetheless, for non-CEQA purposes, the comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project.

As explained in Section 1.2.3.2 of the Recirculated DSEIR, the ASJ allowed for China Shipping to continue operating the terminal under the existing lease (Permit No. 999) signed in 2001. While the lease was supposed to have been amended after certification of the 2008 EIR, "[t]he preparation of an EIR is not generally the appropriate forum for determining the nature and consequences of prior conduct of a project applicant . . .." (Eureka Citizens for Responsible Gov't v. City of Eureka (2007) 147 Cal.App.4th 357, 371). As required under CEQA, the Recirculated DSEIR will be used by LAHD, as the lead agency under CEQA, in making a decision regarding the future operation of the Revised Project. If it is determined that changes to existing mitigation measures are recommended as a result of the Recirculated DSEIR, the Board of Harbor Commissioners will consider amending the lease for operations at Berths 97-109 to include those measures. Any action by LAHD to enforce mitigation measures (past or future), or other lease provisions, would be a separate proceeding outside the scope of this EIR process. In addition, please refer to Master Response 4: Non-Compliance with the FEIR Mitigation Measures.

Response to Comment NRDC-49

The Recirculated DSEIR does not ignore the issue of GHG impacts, but rather fully evaluates the GHG impacts of continued operation of the China Shipping Container Terminal under the Revised Project. That analysis describes the GHG-reducing effect of several of the mitigation measures that are components of the Revised Project and introduces two additional mitigation measures to be imposed on the Revised Project, to reduce its GHG impacts. The analysis in the Recirculated DSEIR quantifies GHG emissions from both stationary and mobile sources and assesses them using a 10,000 mty CO_2E threshold, adopted by the SCAQMD and determined by the LAHD as applicable to Port projects, compared to the 2008 Actual Baseline.

The Recirculated DSEIR discloses that GHG emissions under the Revised Project would exceed this threshold in all study years. This analysis complies with the requirements for determining the significance of GHG impacts under CEQA Guidelines section 15064.4. The Recirculated DSEIR further provides informational disclosure of comparative trends in GHG emissions under the Revised Project, the Revised Project as mitigated, and the project as originally approved in 2008 (the "FEIR Mitigated Scenario"), as well as determining the consistency or inconsistency of the Revised Project with certain statewide, regional and local plans and policies. The Recirculated DSEIR identifies feasible mitigation for the significant GHG emissions impacts, and in addition identifies LM GHG-1, a GHG Credit Fund that would be accomplished through a memorandum of understanding with the California Air Resources Board or other appropriate entity, under which the project site tenant shall either contribute to a fund for GHG-reducing projects and programs on Port of Los Angeles property or, if LAHD is unable to establish the fund within a reasonable period of time, purchase credits from an approved GHG offset registry.

The commenter is mistaken in asserting that the Revised Project must meet a zero net GHG standard, which is not a requirement of CEQA.

Response to Comment NRDC-50

LAHD disagrees with the commenter's statements concerning the analysis of energy impacts of the Revised Project, in Appendix E of the Recirculated DSEIR, under the standards in Appendix F of the State CEQA Guidelines. CEQA Guidelines Appendix F states that "the goal of conserving energy implies the wise and efficient use of energy. The means of achieving this goal include the following: decreasing overall per capita consumption; decreasing reliance on fossil fuels such as coal, natural gas and oil, and increasing the reliance on renewable energy sources." One of the key objectives of the project approved in 2008 (the Approved Project) was to comply with the Port Strategic Plan to maximize the efficiency and capacity of terminals while raising environmental standards through application of all feasible mitigation measures, and one of the results of maximizing terminal efficiency is improved fuel efficiency. One of the purposes of the Revised Project is to further that objective by eliminating some previously adopted measures that have proved to be infeasible or unnecessary; instituting new, feasible, mitigation measures; and modifying other existing measures to enhance their effectiveness (Recirculated DSEIR Section 2.3).

Appendix F further states that "Potentially significant energy implications of a project shall be considered in an EIR to the extent relevant and applicable to the project." The Revised Project and its overall objective were evaluated in Appendix E of the Recirculated DSEIR, which considered the six energy impact types listed in CEQA Guidelines Appendix F. Appendix E also identifies several mitigation measures included in the Revised Project that will increase efficient use of energy.

The analysis in Appendix E does not evaluate alternatives because, as explained in Section 1.7 of the Recirculated DSEIR, "[t]he proposed modifications to the mitigation measures in the Revised Project do not change the Approved Project as a whole and do not require that an alternative be developed that specifically addresses those particular modifications" (p. 1-34). Accordingly, the analysis in Appendix E evaluates baseline and future fuel consumption of the Revised Project, but cannot compare the Revised Project to alternatives.

Appendix E analyzes the Revised Project in terms of overall energy consumption and of energy efficiency, expressed as gallons of fuel used per TEU handled, under baseline and future conditions. It finds that, as a result of the projected fleet turnover of CHE, vessels, trains, and trucks, as well as the imposition of mitigation measures requiring phase-in, in the short term, of lower-emissions CHE, energy efficiency of the CS Terminal would improve in the future under the Revised Project (Appendix E p. E9). The analysis also finds that the Revised Project would have no adverse effects on energy resources. Appendix F of the CEQA Guidelines does not require that the goal of a project be "a zero net GHG and zero net energy facility". Accordingly, the analysis in Appendix E of the Recirculated DSEIR is consistent with the guidance in Appendix F of the CEQA Guidelines and therefore complies with CEQA.

Response to Comment NRDC-51

For the reasons set forth in this FEIR, including the responses to comments submitted on the Recirculated DSEIR, the LAHD has determined that there has been no addition of new information that deprives the public of a meaningful opportunity to comment on a substantial adverse impact or feasible mitigation measures that have not been adopted, and that therefore recirculation is not required under the standards of CEQA (Public Resources Code section 21092.1; CEQA Guidelines section 15088.1).

Response to Comment NRDC-52

This is not a comment on the adequacy of the Recirculated DSEIR. Termination of the existing lease is outside the scope of this SEIR and is not required by CEQA. The comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

2.3.2.8 NRDC Attachment K1

Attachment K1

To: Melissa LinPerrella and David Petitt, NRDC
From: Dana Rowangould, Sustainable Systems Research, LLC
Subject: China Shipping Container Terminal: Excess Emissions from Modified FEIR Mitigations
Date: November 14, 2018

The air quality impacts from the construction and operation of the China Shipping Container Terminal at Berths 97-109 of the Port of Los Angeles (Port) were evaluated in the 2008 Berths 97-109 (China Shipping) Container Terminal Project Final Environmental Impact Statement/Environmental Impact Report (FEIR). Several of the mitigation measures included in the FEIR have not been implemented fully.

In 2018 the Berths 97-109 (China Shipping) Container Terminal Recirculated Draft Supplemental EIR (RDSEIR, or Revised Plan) proposed modifying the emissions mitigations. The RDSEIR analysis includes emissions estimates for several model years, including past years that account for the failure to implement several measures (2012, 2014) and future years that account for the modification to future mitigation activities (2018, 2023, 2030, 2036, 2045). Modified mitigation measures affected emissions from Port cargo handling equipment (AQ-15, 16, 17; which have been modified merged into AQ-15 and 17), drayage trucks (AQ-20, which has been removed), and ocean-going vessels (AQ-9 and 10; which have been modified).

The purpose of this memo is to quantify and illustrate the excess emissions (emissions reductions lost) during the project period (2009 to 2045) due to the modification of mitigation measures at the China Shipping Container Terminal. Key findings are summarized below, while the remainder of this memo describes our analysis methods and results.

Key Findings:

- From 2009 to 2045, the change in mitigations will result in total excess emissions of 1400 tons of NO_X, 192 tons of VOCs, 3,623 tons of CO, 19 tons of PM2.5, 20 tons of PM10, 25 tons of SO_X, and 54 tons of DPM.
- The excess NO_X emissions are equivalent to a typical coal-fired power plant operating for approximately 11 months.
- The excess NO_X, VOC, CO, PM2.5, PM10, SO_X, and DPM that will be emitted from 2009 through the present (2018) are the equivalent of:
  - 120, 300, 680, 79, 55, 730, and 170 million truck miles traveled in 2018, respectively;
  - Emissions from 59,000; 99,000; 280,000; 27,000; 23,000; 590,000; and 45,000 trucks traveling for the entire period from 2009 to 2018, respectively; or

- 75%, 130%, 360%, 35%, 30%, 730%, and 61% of all heavy duty truck emissions occurring within the SCAB region for the entire period from 2009 to 2018, respectively.

- The excess NO_X, VOC, CO, PM2.5, PM10, SO_X, and DPM that will be emitted from 2009 through 2045 are the equivalent of:
  - 210; 700; 2,400; 140; 96; 1,500; and 520 million truck miles traveled in 2018, respectively;
  - Emissions from 56,000; 180,000; 480,000; 32,000; 21,000; 400,000; and 110,000 trucks traveling for the entire period from 2009 to 2045, respectively; or
  - 59%, 200%, 490%, 35%, 22%, 390%, and 140% of all heavy duty truck emissions occurring within the SCAB region for the entire period from 2009 to 2045, respectively.

Methods and Results

NRDC.K1-1

Estimating Excess Emissions Due to China Shipping Mitigation Modifications

In the RDSEIR annual emissions were modeled for each source (including cargo handling equipment, drayage trucks, and ocean-going vessels), each pollutant, each scenario (FEIR, Revised Plan), and in each modeled year (2008, 2012, 2014, 2018, 2023, 2030, 2036, 2045). Emissions totals for each source, pollutant, modeled year, and scenario are shown in Tables B1-661 and B1-669 of the RDSEIR. Note that the "Revised Plan Scenario" definition used here encompasses the past and present failure to meet FEIR mitigation commitments (2009 to 2018) as well as future changes to mitigations (2009 onward), as shown in Table 3.1-1 in the RDSEIR.

To estimate the excess emissions (FEIR emissions subtracted from Revised Plan Emissions) in *intervening years* which were not modeled in the RDSEIR (e.g. 2009 – 2011, 2013, 2015 – 2017, etc.) we performed the following calculations. References to tables refer to tables found in Chapters 2, 3, and Appendix B1 in the RDSEIR.

NRDC.K1-2

Ocean going vessels:

The excess hoteling emissions are attributable to changes in AQ-9 (which requires auxiliary marine power, or AMP) starting in 2010. Excess transit emissions are attributable to changes in ASQ-10 (which requires vessel speed reductions, or VSR, for travel in part of the region) starting in 2009.

To estimate annual excess emissions in intervening years, we multiply the number of excess higher emitting vessels in each intervening year by the amount of excess emissions per excess higher emitting vessel. This calculation is described in more detail below.

Excess Hoteling and Transit Emissions in Modeled Years

Ocean going vessel emissions in modeled years were first split between hoteling, anchorage, and transit activities.[i] The excess emissions ($ExcessEmissions$) for each activity and year were calculated as the Revised Plan emissions ($Emissions_{RevisedPlan}$) minus the FEIR emissions ($Emissions_{FEIR}$) (Eq 1):

$$ExcessEmissions = Emissions_{RevisedPlan} - Emissions_{FEIR} \qquad [1]$$

Number of Excess Higher Emitting Vessel Calls

The number of vessels that emit higher levels of hoteling emissions ($Vessels_{HighEmitting}$) due to a failure to use auxiliary marine power (AMP) for each year under the FEIR and Revised Plan was estimated by multiplying the number of ocean going vessels that visit the Port each year ($Vessels_{All}$)[ii] by the share of ships that do not use AMP in each scenario and year as described in the RDSEIR ($Share_{nonAMP}$)[iii] (see Eq 2). The number of excess non-AMP vessels was calculated as the number of non-AMP vessels under the FEIR subtracted from the number of non-AMP vessels under the Revised Plan, for each year (Eq 3).

$$Vessels_{HighEmitting} = Vessels_{All} * (Share_{nonAMP}) \quad [2]$$

$$ExcessVessels_{HighEmitting} = Vessels_{HighEmittingRevisedPlan} - Vessels_{HighEmittingFEIR} \quad [3]$$

The number of excess vessels that emit higher levels of transit emissions due to a failure to adopt VSR in the area indicated by AQ-10 is estimated similarly to the calculation for hoteling emissions above, except that the share of vessels not using VSR[iv] is used in place of the share of vessels not using AMP.

NRDC.K1-2

Excess Emissions Per Higher Emitting Vessel

The rate of excess hoteling emissions per non-AMP vessel ($ExcessRate$) was obtained by dividing excess hoteling emissions by the number of excess non-AMP vessels in modeled years (Eq 4). The rate of excess hoteling emissions per non-AMP vessel was then linearly interpolated for intervening years that occur between 2013 and 2045 while 2009 to 2011 rates were assumed to equal the 2012 modeled value.

$$ExcessRate = \frac{ExcessEmissions}{ExcessVessels_{HighEmitting}} \quad [4]$$

The rate of excess transit emissions per non-VSR vessel was estimated similarly by using excess transit emissions and the number of excess non-VSR vessels in each project year.

Excess Emissions in Intervening Years

The rate of excess hoteling emissions per excess non-AMP vessel was then multiplied by the number of excess non-AMP vessels to arrive at the estimate of excess hoteling emissions in each intervening project year (Eq 5).

$$Annual\ Excess\ Emissions = ExcessRate * ExcessVessels_{HighEmitting} \quad [5]$$

The excess transit emissions were estimated similarly using the rate of excess transit emissions per non-VSR vessel and the number of excess non-VSR vessels in each project year.

Drayage Trucks:

NRDC.K1-3

Drayage truck emissions of diesel particulate matter (DPM) are expected to be affected by changes in the liquefied natural gas (LNG) requirements under AQ-20 starting in 2012. Because emissions of NO_X, VOC, CO, PM2.5, PM10, and SO_X are modeled as unchanged in the RDSEIR (which assumes that the fleet wide emissions factors for all pollutants except DPM are the same in the two scenarios) we assume they are unchanged in intervening years. The overall modeling approach was similar to the approach used for ocean going vessels – the excess truck emissions

NRDC.K1-3

were estimated based on the number of non-LNG vehicles and the excess truck emissions per excess non-LNG vehicle in each year.

Excess Truck Emissions in Modeled Years

On-site and off-site truck emissions for each scenario and each modeled year[v] were summed to obtain total truck emissions in each scenario. The excess total truck emissions under each scenario was calculated as FEIR emissions subtracted from the Revised Plan emissions.

Number of Excess Higher Emitting Truck Calls

For the intervening year 2013, truck calls were estimated by multiplying estimated truck calls per TEU[vi] by actual throughput in TEUs[vii]. Truck calls for intervening years between 2014 and 2045 were linearly interpolated from modeled years.[viii] The share of trucks using LNG under each scenario[ix] was multiplied by truck calls in each year to estimate the number of non-LNG truck calls in each scenario and year (similar to Eq 2, except using total truck calls instead of vessels and the share of trucks that are non-LNG instead of the non-AMP share.) The number of excess non-LNG trucks was calculated as the number of non-LNG truck calls under the FEIR subtracted from the number of non-LNG truck calls under the Revised Plan (similar to Eq 3, except with non-LNG trucks instead of vessels).

Excess Emissions Per Higher Emitting Truck

The rate of excess truck emissions per non-LNG truck call was obtained by dividing excess truck emissions by the number of excess non-LNG truck calls in modeled years. This calculation is similar to Eq 4, except using truck emissions and the number of non-LNG trucks. The rate of excess truck emissions per non-LNG truck call was then linearly interpolated for intervening years that occur between 2013 and 2045.

Excess Emissions in Intervening Years

The rate of excess truck emissions per excess non-LNG truck call was then multiplied by the number of excess non-LNG truck calls to arrive at the estimate of excess truck emissions in each intervening project year (similar to Eq 5, except using the number of non-LNG trucks).

NRDC.K1-4

Cargo Handling Equipment:

Changes in AQ-15, AQ-16, and AQ-17 are expected to affect emissions from cargo handling equipment. Due to the complexity of these rule changes and their effects on emissions from several different types of cargo handling equipment, the excess emissions in intervening years was simply linearly interpolated[x] from excess emissions exhibited in modeled years[xi].

NRDC.K1-5

Total Excess Emissions:

Excess emissions estimates from the three source types are summed for all analysis years and for the period up through the present in Table 1. The bottom row of the Table indicates the share of excess emissions that are expected to be emitted by the end 2018.

NRDC.K1-5

Table 1: Total Tons of Excess Emissions for the period from 2009 to 2045

	NO_X	VOC	CO	PM2.5	PM10	SO_X	DPM
Through the Present: 2009 to 2018							
Trucks	-	-	-	-	-	-	8
OGV	191	4	18	4	4	13	4
CHE	588	77	1016	7	7	0	5
TOTAL	**778**	**82**	**1034**	**11**	**12**	**12**	**18**
Future Years: 2019 to 2045							
Trucks	-	-	-	-	-	-	24
OGV	283	11	33	7	8	13	8
CHE	339	99	2556	2	1	0	4
TOTAL	**621**	**110**	**2589**	**9**	**8**	**13**	**36**
All Years: 2009 to 2045							
Trucks	-	-	-	-	-	-	33
OGV	474	15	51	11	12	25	12
CHE	926	177	3572	8	8	0	9
TOTAL	**1400**	**192**	**3623**	**19**	**20**	**25**	**54**
Share Emitted by 2018	**56%**	**42%**	**29%**	**55%**	**58%**	**49%**	**33%**

Estimating Equivalent Emissions from Other Activities

NRDC.K1-6

Coal-Fired Power Plant

We estimate typical annual coal-fired power plant emissions of 1,541 tons of NO_X based on 2016 EPA data.[xii] The excess NO_X emissions of 1400 tons from the change in China Shipping mitigations is approximately equivalent to the NO_X emissions from a typical coal-fired power plant operating for approximately 11 months.

Heavy Duty Truck Emissions

NRDC.K1-7

Emissions Rates

We estimate typical heavy duty truck emissions for all heavy duty trucks traveling within the South Coast Air Basin (SCAB Trucks), including emissions from exhaust, brake wear, and tire wear but excluding road dust.[xiii] We estimate emissions per mile for a typical truck in 2018. We also estimate emissions of *one typical truck* traveling for the 10 year period up to the present (2009 to 2018) and for one typical truck traveling for the entire 37 year project analysis period (2009 to 2045). We also estimate total emissions from *all trucks* (the entire fleet) traveling within the SCAB for the periods from 2009 to 2018 and 2009 to 2045. Results are shown in Table 2.

NRDC.K1-7

Truck Equivalents

The number of trucks that are equivalent to the excess emissions from the modified mitigations at the China Shipping Terminal are shown in Table 3. For each period evaluated (up to the present and the entire analysis period), we estimate emissions from the equivalent number of trucks traveling for the entire period as well as the equivalent percentage of emissions from the entire truck fleet, which represents all heavy duty truck emissions that occur within the SCAB. We also estimate the equivalent miles traveled in 2018 for each excess emissions estimate.

From Table 3, we see that the excess diesel particulate (DPM) emissions that will occur by the end of 2018 due to the modified China Shipping mitigations are equivalent to 170,000,000 heavy truck miles traveled in the region in 2018, or to the DPM emissions from 45,000 heavy trucks traveling for the entire period from 2009 to 2018. This is equivalent to 61% of the DPM emitted by the entire fleet (all heavy duty trucks) traveling within the South Coast Air Basin (SCAB) for the entire period from 2009 to 2018. Equivalencies for other pollutants range from 55 to 730 million truck miles in 2018; emissions from 23,000 to 590,000 trucks traveling for the entire period; and 61% to 730% of the entire fleet's emissions within the SCAB region.

Looking at the period from 2009 to 2045, the excess DPM emissions due to the modification of the China Shipping mitigations are equivalent to 520 million truck miles in 2018, or DPM emissions from 110,000 heavy trucks traveling for the entire period from 2009 to 2045. This is equivalent to 140% of the DPM emissions from the entire fleet (all heavy duty trucks) traveling in the South Coast Air Basin for the entire period from 2009 to 2045. Equivalencies for other pollutants range from 96 to 1,500 million truck miles in 2018; emissions from 21,000 to 480,000 trucks traveling for the entire period; and 22% to 490% of the entire fleet's emissions in the SCAB region.

Table 2: Truck emission rates in the South Coast Air Basin

	NO_X	VOC	CO	PM2.5	PM10	SO_X	DPM
SCAB Truck Emissions Rates							
Tons per mile in 2018	6.7E-06	2.8E-07	1.5E-06	1.4E-07	2.1E-07	1.7E-08	1.0E-07
Tons per truck:							
Traveling for 10 years (2009 to 2018)	1.3E-02	8.3E-04	3.7E-03	4.0E-04	4.9E-04	2.1E-05	3.9E-04
Traveling for 37 years (2009 to 2045)	2.5E-02	1.1E-03	7.6E-03	6.1E-04	9.3E-04	6.3E-05	4.8E-04
Tons from the entire fleet (all truck travel in SCAB):							
Traveling for 10 years (2009 to 2018)	1034	63.9	285	31.1	38.6	1.7	28.9
Traveling for 37 years (2009 to 2045)	2381	93.6	738	55.2	89.0	6.5	38.5

Table 3: Heavy Duty Truck Emissions Equivalence to Excess Emissions

	NO_X	VOC	CO	PM2.5	PM10	SO_X	DPM
10 Years through the present: 2009 to 2018							
Million Truck Miles in 2018	120	300	680	79	55	730	170
Trucks traveling for the entire (10-year) period	59,000	99,000	280,000	27,000	23,000	590,000	45,000
Share of fleet (all SCAB trucks) travel for entire period	75%	130%	360%	35%	30%	730%	61%
37-year Analysis Period: 2009 to 2045							
Million Truck Miles in 2018	210	700	2,400	140	96	1,500	520
Trucks traveling for the entire (37-year) period	56,000	180,000	480,000	32,000	21,000	400,000	110,000
Share of fleet (all SCAB trucks) travel for entire period	59%	200%	490%	35%	22%	390%	140%

[i] Emissions data by activity are presented in tables B1-117, 119, 121, 123, 125, 127, 129, 131, 145, 147, 149, 151, 153, 155, 157, and 159 of the RDSEIR. Because the total of these three activity types did not correspond to the totals shown in B1-661 and B1-669 (it appeared that several pollutant/year combinations were erroneously switched), we corrected these values by switching the activity-specific and total values correspond to the totals in B1-661 and B1-669. Below is a table summarizing the corrections made to the total values in the FEIR scenario data (in tons per year). Colors indicate rows that correspond, where values were switched. We made analogous corrections to FEIR emissions by activity as well as to totals and emissions by activity in the Revised Plan data.

	Raw OGV activity totals (from B1-117 to B1-131)			Corrected OGV activity totals		
	2008	**2012**	**2018**	**2008**	**2012**	**2018**
HC	3.11	1.13	3.22	2.63	4.07	15.91
PM2.5	2.63	4.07	15.91	3.20	1.13	3.82
PM10	43.14	4.95	9.54	4.00	1.22	4.14
SO_X	4.00	6.53	21.9	43.14	4.95	9.54
CO	4.00	1.22	4.14	4.00	6.53	21.90
DPM	3.20	1.13	3.82	3.11	1.13	3.22

We examined the PM emissions data with and without these corrections and the corrected PM data (which assumed that B1-661 and B1-669 were correct) appears to correspond more closely to what we would expect based on trends in peak emissions shown in the RDSEIR.

[ii] Table 2.3 provides vessel calls for modeled years. These values are consistent with the values in Tables B1-106 and B1-134, corresponding to half of the "total number of transits" except where there appear to be typos in the sum column in the Appendix B tables. Intervening years were linearly interpolated.

[iii] Under the FEIR, we use actual compliance rates from Table 2.1 in 2008 and 2009, and the FEIR committed compliance rates from 2010 to 2045. Under the Revised Plan, we use actual compliance in 2008 to 2017 from Table 2.1, in 2018 we assume the actual compliance rate from 2017 is repeated, and in 2019 to 2045 we assume the Revised Plan compliance requirement of 95%.

[iv] As described in Table 2.1 of the RDSEIR.

[v] From Tables B1-661 and B1-669.

[vi] Truck calls and throughput (in TEUs) in modeled years were obtained from Table 2.3. Truck calls per TEU were then estimated for modeled years 2012 and 2014. The rates of trucks calls per TEU in 2013 was linearly interpolated.

[vii] From Table 2.2.

[viii] Truck calls in modeled years were obtained from Table 2.3.

[ix] Based on FEIR requirements and the Revised Plan rates of LNG use indicated in Appendix B1.

[x] This simplification is consistent with the linear interpolation approach used in the health risk assessment included in the RDSEIR. Additionally, we compared our total 2009 to 2045 excess emissions estimates for ocean going vessels and drayage trucks to estimates based on simple linear interpolation; differences ranged from -7% to 6%.

[xi] As shown in Tables B1-661 and B1-669.

[xii] "2016 vs 2017 SO_2, NO_X, and CO_2 Comparisons, Annual. Acid Rain Program and Cross-State Air Pollution Rule Emissions, Emissions Rates, and Heat Input Changes at Facilities (Coal Units Only)" is available at https://www.epa.gov/sites/production/files/2018-02/arpcaircoal16vs17annual_0.xls. 2016 is the most recent year available that is not preliminary. The median NOx emissions from all facilities listed is used to represent a typical coal-fired power plant emissions of NO_X.

[xiii] EMFAC2017v1.0.2 is used to estimate annual emissions, truck miles traveled, and truck populations for both truck categories in each year in the South Coast Air Basin. The heavy duty truck category includes POLA trucks in the SCAB region. DPM estimates are based on PM10 exhaust emissions from diesel truck categories.

Response to Comment NRDC.K1-2

LAHD understands the interpolation-based methodology applied by the commenter to estimate approximate intervening years' OGV emissions. However, the LAHD considers that this type of analysis is not an accurate representation of vessel mass emissions for those intervening years because it does not consider annual fluctuations in vessel fleet behavior, such as the number of vessel calls, the mix of vessel sizes and tier levels of their engines visiting a particular year, and their AMP-capability, none of which is linear. Presenting this type of information would be speculative, and in any case CEQA does not require a bottom-up emissions analysis for every analysis year. Doing so would be onerous and would produce too much information to incorporate into a comprehensible document.

Response to Comment NRDC.K1-3

The LAHD considers that the interpolation-based analysis employed by the commenter is not an accurate representation of drayage truck PM_{10} (and associated DPM) mass emissions for intervening years because it does not consider link-level emissions, which use speed-based emission factors throughout the modeled network of off-site truck trips. This influences the off-site emissions at each modeled location, the summation of which yields the total off-site emissions used in emissions impact estimates.

Response to Comment NRDC.K1-4

The LAHD considers that the interpolation-based analysis employed by the commenter is not an accurate representation of CHE mass emissions for intervening years as it does not reflect the year-to-year fluctuations in emissions caused by deterioration and equipment turnover, whether naturally (due to equipment end-of-life scrappage) or as a result of mitigations. CHE emission factors used for analysis in the Recirculated DSEIR did account for those effects, which explains why the resulting CHE emissions do not follow a clear linear increasing or decreasing trend across analyzed years.

Response to Comment NRDC.K1-5

The LAHD considers that, given the caveats to the commenter's calculations described in Responses to Comment NRDC.K1-1 through NRDC.K1-4, commenter's Table 1 does not provide any meaningful determination of total tons of so-called "excess emissions." More accurate estimates are presented in the Recirculated DSEIR, as described in Response to Comment NRDC-10.

Response to Comment NRDC.K1-6

The LAHD does not consider that the juxtaposition of mass emissions from a coal-fired power plant during a short period (less than one year) with the aggregated yearly emissions over 37 years from the mobile sources of the Revised Project provides any meaningful determination for purposes of CEQA.

Response to Comment NRDC.K1-7

With regard to the comment's estimate of "typical heavy-duty truck emissions…per mile for a typical truck in 2018" and estimates presented in commenter's Tables 2 and 3, LAHD notes that the numerous methodological differences between the approach used by the commenter and the Recirculated DSEIR's air quality analysis mean that the emissions estimates from the two documents are in no way comparable.

The emission rates, i.e., emissions per mile, used in the Recirculated DSEIR air quality analysis were based on the age distribution of the port-area drayage truck fleet for each modeled year. This approach differs greatly from the commenter's use of EMFAC2017's default age distribution for diesel heavy-duty trucks because the EMFAC distribution combines not only a "default" age mix for the port drayage fleet, but also emissions and activity from other diesel heavy-duty truck fleets in the South Coast air district. Given the very different duty cycles and age distributions of non-port drayage fleets, the EMFAC data are bound to be very different in terms of a composite gram-per-mile rate. In addition, the Recirculated DSEIR emission rates are link-speed based whereas the commenter's analysis appears to use the default speed distribution in EMFAC. In addition, it is not clear what trip mileage is considered in the commenter's analysis. The Recirculated DSEIR's analysis accounts for on-site travel distance and trip distances derived from network ground transportation modeling for off-site trucks.

The Recirculated DSEIR does not calculate either combined-years emissions for a typical truck or total South Coast fleet wide emissions (Table 3) as that information is not required by CEQA and does not provide any useful information about the Revised Project.

It is not also not clear if the commenter's analysis only involves off-site truck activity or both on-site and off-site trucks activity. PM_{10} (and thus, DPM) and other key pollutant emission rates (e.g., NO_X, VOC and CO) change significantly with vehicle speed, which is significantly less on site than off site. Hence, the commenter's analysis does not provide an apple-to-apples comparison to evaluate truck-related DPM emissions, or any other pollutant, from the Recirculated DSEIR, as it lacks the port-specific information that was used in the Recirculated DSEIR.

Finally, CEQA does not require a calculation of "excess emissions," as the non-CEQA term is used by the commenter, for each year of the study period, as explained in Response to Comment NRDC.K1-1.

2.3.2.9 NRDC Comment Letter on the 2017 DSEIR

& San Pedro and Peninsula Homeowners' Coalition
San Pedro Peninsula Homeowners United
Urban and Environmental Policy Institute, Occidental College

City of Los Angeles Harbor Department
Christopher Cannon, Director
Environmental Management Division
P.O. Box 151
San Pedro, CA 90733-0151
ceqacomments@portla.org
Via Email and Courier

September 29, 2017

Re: Draft Supplemental Environmental Impact Report – Berths 97-109 [China Shipping] Container Terminal Project

Dear Mr. Cannon,

On behalf of the Natural Resources Defense Council, San Pedro and Peninsula Homeowners' Coalition, San Pedro Peninsula Homeowners United, Coalition for Clean Air, East Yard Communities for Environmental Justice, Long Beach Alliance for Children with Asthma, and Urban & Environmental Policy Institute, Occidental College, we provide comments on the Draft Supplemental EIR for Berths 97-109, China Shipping Container Terminal (SDEIR). Several of us litigated over the expansion of the China Shipping terminal nearly two decades ago, a project which the Court of Appeal held violated the California Environmental Quality Act (CEQA). All of us advocate to reduce smog-forming pollution, diesel emissions, and greenhouse gases from port operations, which contribute to violations of air quality standards, increased impacts upon public health—particularly in environmental justice communities, and global climate change. Accordingly, we have a strong interest in ensuring that the SDEIR discloses the environmental and health impacts of the China Shipping project and sets forth all feasible mitigation.

These comments are directed to the SDEIR and do not address the Port's violations of the 2004 Amended Stipulated Judgment (the Amended Stipulated Judgement or ASJ). *NRDC et al. v. City of Los Angeles et al.*, No. BS 070017 (Cal. Sup. Crt. June 14, 2004) (Amended Stipulated Judgment, Modification of Stay, and Order thereon). All signatories to this letter who were parties or members of parties involved in the ASJ reserve all rights with respect to breaches of the ASJ, and note that the Port's obligations under the ASJ are separate from and in addition to those required under CEQA.

Our comments are supported by documents provided to you on a hand-delivered flash drive, and within a drop box folder provided to you in the email transmission containing our electronic comments. The documents on the flash drive and within the drop box folder are the same. All documents are listed in the attached index.[1]

Our written comments below are organized as follows:

FACTUAL CONTEXT AND SUMMARY OF CONCERNS

NRDC DSEIR-1

The public has had a long and complicated relationship with the Port's management of the China Shipping terminal.

In 2001, signatories to this letter challenged the Port's plans to expand the terminal, asserting in large part that the expansion would result in undisclosed and unmitigated air pollution in violation of CEQA. In 2002, the Court of Appeal agreed with those concerns and enjoined the Port from further construction and operation of the terminal pending preparation of a project-

[1] On the flash drive, the electronic file for each document is assigned an "Attachment" number. Each attachment and corresponding document is listed in the accompanying index. Attachments are referenced herein as ("Attachment XX"). Attachments consisting of documents produced in response to Public Records Act requests are also bates stamped.

NRDC DSEIR-1

specific environmental impact report (EIR). In 2004, the Port and City entered a settlement agreement with the litigants that required, among other things, that project-specific EIR, which was completed and certified by the Board of Harbor Commissioners in December 2008. In the 2008 EIR, the Port committed to implement pollution-cutting measures for the China Shipping project. In 2015, the Port revealed that it violated that commitment.

In documents obtained through Public Records Act requests,[2] the facts reveal that only several months after the Port certified the 2008 EIR, the Port began providing waivers to China Shipping excusing it from complying with a key commitment in the EIR: that ships utilize shore-power. These waivers were granted behind closed doors, not just once but at least five times, to excuse noncompliance for over 4 years up until the shore-power requirements were mandated by state law.[3] During that time, the Port also failed to enforce measures that would have further reduced pollution from ships, as well as trucks and cargo handling equipment.

In 2015, when the Port disclosed that it had not implemented all of the EIR's measures, it committed to perform a new environmental study (the SDEIR) to explain why mitigations went un-implemented, and to identify replacement measures to ensure the China Shipping project fully complies with CEQA. Unfortunately, the SDEIR is inadequate in both respects.

The SDEIR claims that air pollution control measures the Port committed to in 2008 are now infeasible. Yet, none of the Port's "evidence" adequately explains how measures the Port certified in 2008 as economically, technologically, and operationally feasible, became impracticable. Instead, it appears that the deadlines for completing the mitigations became more difficult due to the Port and China Shipping's own neglect and delay.

Tellingly, when the 2008 EIR was certified, China Shipping never contended that any of the measures were infeasible. And over the course of the last ten years, the shipping line has largely ignored requests from the Port to explain its noncompliance. Indeed, in a letter dated as late as January of this year—just nine months ago—the Port maintained that China Shipping had not provided meaningful information demonstrating infeasibility.[4] The Port even acknowledged in a previous letter to China Shipping that noncompliance with the 2008 measures risked shutting down the entire terminal.[5] Caught between China Shipping's silence and the Port's CEQA obligations, the Port began creating its own record of purported infeasibility in anticipation of litigation.

The primary result of the Port's actions is that for more than a decade, emissions from the China Shipping terminal have been higher than they should have been. And to make matters worse, the SDEIR does not provide an assessment of this harm, let alone a sufficient remedy.

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[2] *See generally* Attachments A1–A208.
[3] *See* Attachment A13 (POLA000633–34); Attachment A23 (POLA000822–23); Attachment A25 (POLA00825–26); Attachment A61 at POLA001429–30; Attachment A62 at POLA001462.
[4] Attachment A63 at POLA001476-77.
[5] Attachment A30 (POLA000979–86).

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The SDEIR never quantifies how much additional NOx or PM local communities shouldered over the last decade. Instead, it responds that pollution levels from the terminal were not as bad as predicted in the 2008 EIR—implying that any "excess emissions" were previously studied, so no harm was committed. Such posturing is remarkable. Inflated emissions projections in a decade old environmental study do not excuse the Port from quantifying the actual, additional pollution that communities shouldered from terminal operations. These excess emissions must now be mitigated prospectively, and an honest accounting of this pollution is the first step to ensuring that all feasible mitigations are adopted for the revised project.

Given this failure, it's no surprise that the SDEIR's revised mitigation measures are unresponsive to the project's full scope of emissions. The revised measures also fail to account for technological advancements at other terminals, more aggressive measures the Port has required of its own tenants, the San Pedro Bay Ports' Draft Clean Air Action Plan, and the Mayors' zero emission goals.[6]

The SDEIR also fails to assess adequately and mitigate the project's greenhouse gas emissions, and preform the requisite energy conservation analysis mandated by CEQA.

In short, the Port just can't seem to get it right when it comes China Shipping. For nearly two decades, this terminal has been embroiled in broken promises, litigation, and CEQA non-compliance. Instead of turning a new page, the SDEIR repeats too much of the past. For the reasons outlined below, the SDEIR must be revised to comply with the law.

ERRORS IN THE SDEIR

The China Shipping terminal will use ships, tugboats, trucks, trains, and cargo handling equipment that emit diesel exhaust, smog-forming pollutants, and greenhouse gases. In 2036, the project is expected to handle nearly 1.7 million TEUs that will be supported by 156 vessel calls per year and over 1.5 million truck trips annually. SDEIR at 2-12, Table 2-3. The project is located in an air basin that violates national air quality standards for ozone and particulate matter, and in a State that has set a high bar for reducing climate changing pollutants. The highest modeled air toxics risk in the air basin remains near the ports, even though progress has been made over the last decade. SDEIR at 3.1-10. The SDEIR acknowledges numerous sensitive receptors in the communities near the terminal, including schools, day care centers, medical facilities, and recreational areas whose users will be disproportionately impacted by the project. SDEIR at 3.1-11, Figure 3.1-1.

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[6] Joint Directive, Los Angeles Mayor Eric Garcetti & Long Beach Mayor Robert Garcia, Creating a Zero Emissions Goods Movement Future: A Joint Declaration of the Mayors of the Cities of Los Angeles and Long Beach (Attachment D5); Press Release, City of Los Angeles, Mayor Garcetti and Long Beach Mayor Robert Garcia Announce Zero Emissions Goals for San Pedro bay Ports (June 12, 2017), *available at* https://www.lamayor.org/mayor-garcetti-and-long-beach-mayor-robert-garcia-announce-zero-emissions-goals-san-pedro-bay-ports (Attachment H7).

As discussed below, the SDEIR fails to adequately analyze or mitigate the effects of the Revised Project on these communities, and on global climate change.

I. THE SDEIR'S 2014 BASELINE VIOLATES CEQA

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The Port's failure to comply with legally-binding mitigation measures created excess emissions that would not have occurred had the Port complied with the law. Rather than own their mistake and try to fix it, in the SDEIR the Port tries to hide the extent of the excess emissions by creating a fictitious baseline that ignores them. Such tactics are factually and legally unsupportable.

The SDEIR utilizes a "2014 Mitigated Baseline" and a "2014 Unmitigated Baseline" to determine whether the project results in significant air quality impacts. SDEIR at 3.1-42 to 3.1-63. The SDEIR defines these terms 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).

SDEIR at App. B1-4. In simple terms, the "unmitigated baseline" is based on actual terminal activities and only the mitigation measures that were complied with. The "mitigated baseline" assumes actual terminal activities and the counterfactual assumption that the Port fully complied with all 2008 mitigation measures.[7]

As discussed below, the SDEIR's reliance on a 2014 baseline is contrary to applicable caselaw, and excludes from analysis, disclosure, and mitigation, emissions generated before 2014 and which necessitated the current SDEIR.

Below, we (1) outline the legal requirements for determining the CEQA baseline; (2) assert that 2000–2001 is the proper baseline for the project under CEQA review; (3) describe how using a 2014 baseline hides environmental impacts attributable to the Revised Project; (4) provide examples of how a 2000–2001 baseline would provide valuable information; and (5) explain how the SDEIR fails to provide an adequate justification for its 2014 baseline.

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[7] As discussed below, we agree that the SDEIR should compare the years when the 2008 measures were to phase in with the years when the measures were not implemented (before and after 2014). Data underlying the 2014 Mitigated and Unmitigated Baselines could thus be used for that purpose. It should not be used, however, as the CEQA baseline for the project.

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A. Legal Requirements for CEQA Baselines

Baseline conditions are normally the environmental conditions that exist at the commencement of the environmental review of the project. CEQA Guidelines § 15125(a); *POET v. Cal. Air Resources Bd.*, 12 Cal.App.5th 52, 57 (Cal.Ct.App. 2017). Stated differently, the baseline normally consists of pre-project conditions or conditions "absent" the project. *See Communities for a Better Env't v. S. Coast Air Quality Mgmt. Dist.,* 48 Cal.4th 310, 315 (Cal. 2010); *Neighbors for Smart Rail v. Exposition Metro Line Construction Authority*, 57 Cal.4th 439, 447 (Cal. 2013). When an agency selects a different baseline, it must provide an adequate justification. *POET*, 12 Cal.App.5th at 79.

Adequate justifications include substantial evidence demonstrating that departing from the normal baseline "promotes public participation and more informed decisionmaking by providing a more accurate picture of a proposed project's likely impacts," or that a pre-project conditions baseline would be misleading, or provide no or little relevant information. *POET*, 12 Cal.App.5th at 79 (quoting *Neighbors*, 57 Cal.4th at 453, 513).

As recognized recently by the Court of Appeal, determining the appropriate baseline requires accurately defining the CEQA "project" subject to environmental review. *POET*, 12 Cal.App.5th at 77 ("When the whole of a project is properly identified, then the conditions defining the project's baseline can be determined."). A "project" is "an activity which may cause either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment, and . . . that involves the issuance to a person of a lease, permit, license, certificate, or other entitlement for use by one or more public agencies." Cal. Pub. Res. Code § 21065. This definition is further augmented by the CEQA Guidelines, which defines a "project" as "the whole of an action, which has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment...." CEQA Guidelines § 15378, subd. (a); *Toulumne County v. City of Sonora*, 155 Cal.App.4th 1214, 1222 (Cal.Ct.App. 2007).[8]

B. The Proper CEQA Baseline in This Case Is 2000–2001

Here, the project approved in 2008 *and* the revisions proposed in the SDEIR are part of a single CEQA project; these activities represent the "whole of the action." *See POET*, 12 Cal.App.5th at 73–77 (holding that the agency's original low-carbon fuel standard (LCFS) regulations and revised LCFS regulations constituted a single project). The SDEIR appears to adopt this view when it defined the "Revised Project" as the "the continued operation of the CS Container

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[8] Courts broadly interpret the term "project" in an effort "to afford the fullest possible protection to the environment." *Toulumne County*, 155 Cal.App.4th at 1222–23 (citing California Supreme Court and Court of Appeal cases). This broad interpretation ensures that "the requirements of CEQA 'cannot be avoided by chopping up proposed projects into bite-size pieces' which, when taken individually, may have no significant adverse effect on the environment." *Id.* at 1223 (citing *Plan for Arcadia v. City Council of Arcadia*, 42 Cal.App.3d 712, 726 (Cal.Ct.App. 1979)).

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Terminal[9] under new and/or modified mitigation measures . . . compared to those set forth in the 2008 EIS/EIR for the Approved Project." SDEIR at 2-11; *see also* Notice of Preparation of a Draft Supplemental Environmental Impact Report for the Berths 97-109 [China Shipping] Container Terminal Project at 1, 8 (Sept. 18, 2015) (proposed project consists of continued operation of the China Shipping Container Terminal, Berths 97-109 under new or modified mitigation measures)(NOP).

With this project definition in mind, the normal baseline would be the physical conditions existing at the time the environmental review for the *original* project commenced; *not* the conditions at the time the Notice of Preparation for the *SDEIR* was published. Indeed, given that the (original) approved project and the revised project constitute a single project under CEQA, it is incorrect for the SDEIR to portray the 2014 baseline as the normal "existing conditions" baseline described in section 15125(a). SDEIR at 2-25. The Port's interpretation of "existing conditions" illegally piecemeals the revisions to the project from the project approved in 2008. *POET*, 12 Cal.App.5th at 103–04.

More importantly, determining the normal "existing conditions" baseline for the entire project requires an understanding of the China Shipping project's history. As acknowledged in the 2008 DEIR, the project illegally commenced in 2001 before proper environmental review was preformed, resulting in litigation and a settlement agreement (the ASJ). A court order required the Port to comply with CEQA and complete a project-specific EIR for the China Shipping project. The ASJ and the subsequent EIR set forth a "pre-project" baseline that promoted CEQA Guidelines section 15125(a), and recognized the unique context of the project. The DEIR states:

> The CEQA baseline employed in this [2008 DEIR] document is governed not only by the CEQA Guidelines [15125(a)], but also by the terms of the Amended Stipulated Judgment (ASJ) . . . Section VI(A)(2) of the ASJ provides that: "The baseline for consideration of impacts from the China Shipping Project shall be either zero or the baseline for Berths 97-109 prior to approval of the lease in March 2001."

DEIR at 2-53. The 2008 EIR went on to utilize a CEQA baseline year of April 2000–March 2001, which again, represented pre-project conditions, and was required by the ASJ. DEIR at 2-1; 2-54–2-59.[10]

[9] The 2008 EIR defines the China Shipping Container Terminal project as all three phases of terminal construction and development that are designed to optimize container terminal operations, along with a 40-year lease (2005–2045). Berths 97-109 [China Shipping] Container Terminal Project Final Environmental Impact Statement/Environmental Impact Report at 1-1; 1-2; 2-14 (FEIR).

[10] The SDEIR's NOP also signaled that the SDEIR would use a 2001 baseline. The NOP states that because the SEIR is to serve as a supplement to the previously certified 2008 FEIR, "impacts and conditions presented in the previous EIR will serve as the primary base of comparison for the analysis." NOP at 9. As noted, the 2008 FEIR used a 2001 baseline.

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Given the "project" currently under review, the ASJ, and the baseline adopted in the 2008 EIR for the same project, the SDEIR must employ a 2000–2001 baseline.[11]

C. The 2014 Baseline Hides Impacts

The purpose of the SDEIR is to provide the information and analysis necessary to make the previously certified EIR adequate for the project as revised. CEQA Guidelines §15163. Stated differently, because the Port failed to comply with all the mitigation measures it committed to in the 2008 EIR, a supplemental environmental document was required to substantiate the Port's newly-minted claims of infeasibility, and to ensure that the project's significant impacts are reported and mitigated to the greatest degree possible. The SDEIR's 2014 baseline undermines this purpose, and infects the entire EIR.

First, by relying on a 2014 baseline, the SDEIR omits a comparison of the project as revised with pre-project (2000–2001) conditions. The fundamental goal of an EIR is to inform decision makers and the public about the environmental consequences of a project. *Neighbors*, 57 Cal.4th at 505. Such an assessment requires "delineating the conditions prevailing absent the project." *Id*. This comparison is necessary to understand the project's *entire* effects, and for the Board of Harbor Commissioners to render the findings required under CEQA Guidelines 15091 for each significant effect shown in the previous EIR.[12]

Second, by using a 2014 baseline, the SDEIR avoids disclosing the excess emissions shouldered by the community due to the Port's failure to implement the mitigations at issue. There is no dispute that failing to implement all the mitigation measures embodied in the 2008 EIR resulted in more air pollution than if those measures were fulfilled. SDEIR at 1-31, 1-32. Most of these measures were set to phase in between 2004 and 2018.[13] An accounting of these emissions is required as a direct project effect (attributable to the "Revised Project"), and cannot be piecemealed from consideration by using a 2014 baseline. *See POET*, 12 Cal.App.5th at 73, 81.

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[11] Given the discretion afforded to agencies in selecting a baseline, we acknowledge that there may be a baseline year other than 2000–2001 that could be rationalized, including 2004, which represents the first year that mitigations under the 2008 EIR were to phase-in. But under no circumstances does a 2014 baseline serve CEQA's informational purpose.

[12] Figures 1, 2, 7–9 of the STI Report visually depict the difference in emissions levels between the 2014 Mitigated Baseline and 2000–2001 baseline level used in the FEIR. STI Technical Review of DSEIR, China Shipping Terminal Project (Sept. 2017) (Attachment I1).

[13] Measures to reduce operational emissions from yard equipment were set to phase in as early as 2004 (MMAQ-15 and MMAQ-17). Port of Los Angeles, China Shipping FEIR, Transmittal 4: Berth 97-109 [China Shipping] Container Terminal Project Mitigation Measures, *available at* https://www.portoflosangeles.org/EIR/ChinaShipping/FEIR/_Mitigation_List.pdf ("FEIR Mitigation Measures"). The last measure to phase in is MMAA-20, which requires 100% LNG trucks by 2018. Port of Los Angeles, FEIR, Berth 97-109 [China Shipping] Container Terminal Project, Mitigation Monitoring and Reporting Program, at 2-13–2-20, *available at* https://www.portoflosangeles.org/EIR/ChinaShipping/FEIR/MMRP.pdf ("FEIR Mitigation Monitoring and Reporting Program").

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Several charts in the SDEIR help illustrate the excess emissions that were excluded from consideration based on the SDEIR's baseline. For example, MMAQ 9 called for increased use of AMP starting from 2005 through 2011, with 100% of ships using AMP by 2011. SDEIR Table 14 of Appendix D, reproduced below, depicts the levels of compliance between 2005 and 2013, showing significant noncompliance *before* 2014.[14] Highlighted in red are the most egregious years of noncompliance.

Table 14. Evaluation of MM AQ-9.

MM AQ-9: Alternative Maritime Power		
Vessels must use AMP at specified fractions of vessel visits.		
Year	**Measure**	**Actual**[15]
2005	60%	95%
2005 July	70%	97%
2006	70%	46%
2007	70%	87%
2008	70%	87%
2009	70%	78%
2010	90%	72%
2011	100%	65%
2012	100%	12%
2013	100%	34%

MM AQ 10 required 100% of vessel visits in 2009 and thereafter to comply with the VSR requirement of 12 knots out to 40nm. Table 15 in Appendix D details compliance with this measure. Notice that in 2009, only 20% of ships complied with the 40 nm required, and between 2010 and 2012, compliance remained below 50%.

[14] Table 14 of SDEIR Appendix D incorrectly portrays the percentages of AMP required in 2011–2013 as 90%; the 2008 EIR required 100% of vessels to use AMP starting in 2011. It is unclear if this error affected Appendix D's conclusions. In any event, we have updated our reproduction of Table 14 to reflect the correct requirements.

[15] There is conflicting data on China Shipping's compliance with the AMP measure. For example, between 2005 and 2009 (except for 2006), Table 14 in Appendix D reports higher AMP compliance rates than Chapter 2 of the SDEIR. *Compare* SDEIR App. D at Table 14 *with* SDEIR at Table 2-1. The Port needs to resolve this inconsistency and determine how it affected its analysis.

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Table 15. Evaluation of MM AQ-10.

MM AQ-10: Vessel Speed Reduction Program			
100% of vessel visits 2009 and thereafter must comply with VSRP requirement of 12 knots out to 40nm.			
Year	**Measure**	**Actual 20 nm**	**Actual 40 nm**
2009	100%	99%	20%
2010	100%	97%	42%
2011	100%	99%	41%
2012	100%	93%	47%
2013	100%	99%	89%

MMAQ-15 required, among other things, all yard tractors to run on alternative fuel (LPG) beginning September 10, 2004 until December 31, 2014. Table 17 from Appendix D below shows that only about 40% of the yard tractors complied with this measure between 2005–2007.

Table 17. Evaluation of MM AQ-15.

MM AQ-15: Yard Tractors at Berth 97-109 Terminal			
All yard tractors operated at the Berth 97-109 terminal shall run on alternative fuel (LPG)			
Year	**Measure**	**Actual**	**Remaining Diesel**
2005	100%	40%	DOC, Emulsified Diesel
2006	100%	42%	DOC, Emulsified Diesel
2007	100%	42%	DOC
2008	100%	100%	
2009	100%	100%	
2010	100%	100%	
2011	100%	100%	
2012	100%	100%	
2013	100%	100%	

MMAQ-20 required the phase in of LNG trucks. Appendix D Table 21, reproduced below, depicts the Port's meager compliance through 2013.

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Table 21. Evaluation of MM AQ-20.

MM AQ-20: LNG Trucks		
Trucks must be LNG-fueled		
Year	**Measure**	**Actual**
2012	50%	10.0%
2013	50%	9.4%

Further, under NRDC's direction, Sonoma Technology, Inc. (STI) estimated the excess on-site truck emissions from the Port's failure to comply with the LNG truck measure in 2013, 2014, 2017, and 2018.[16] STI's analysis shows significant differences between the Approved and Revised measures in terms of on-site drayage truck NOx and PM emissions. STI Report, Figures 4 & 5; *see also* STI Report Figures 1, 2, 8–13 (charts depicting the years in which the SDEIR provides no information about the actual and/or projected excess emissions). This is just one example of how the SDEIR should have disclosed the Revised Project's changes on the environment, but did not.

The SDEIR was supposed to disclose how changes to the project are likely to affect the environment. Here, the changes to the project—in the form of increased emissions due to unfulfilled and unenforced mitigation measures—are excluded from the SDEIR simply because they proceeded 2014—a year that is not relevant to the definition of the project in this case.

Third, the 2014 Mitigated Baseline excludes the emissions benefits from full compliance with the LNG truck measure (MMAQ-20) and the yard tractor measure (MMAQ-15). Pursuant to the original LNG truck measure, heavy duty trucks entering the terminal were to be LNG fueled in the following percentages:

- 50% in 2012–2013
- 70% 2014–2017
- 100% in 2018 and thereafter

SDEIR at 2-4 (Table 2-1). Because the baseline is set at 2014, the emissions benefits that were supposed to be associated with this measure in 2015–2018, including 100% LNG trucks by 2018, are excluded from the baseline.

Beginning in 2015, all yard tractors were to be "the cleanest available NOx alternative-fueled engine meeting 0.015 gm/hp-hr for PM." SDEIR at 2-3 (Table 2-1). This mitigation requirement is also missing from the 2014 Mitigated Baseline because it didn't phase in until 2015.

While the full effect of these omissions is unclear, at a minimum, they result in an inaccurate portrayal of the differences between the "mitigated" baseline and the Revised Project. They also

[16] STI Technical Review of DSEIR, China Shipping Container Terminal Project (Sept. 2017) (Attachment I1).

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undermine the informational value of a 2014 Mitigated Baseline that fails to include all the 2008 mitigation measures, and artfully excludes measures that would have resulted in significant reductions in NOx and PM emissions, and corresponding health impacts.

D. Examples of How Using a 2000–2001 Baseline Would Reveal Valuable Information

Using a 2000–2001 baseline would result in an SDEIR that includes (1) an environmental analysis that begins in 2000, and attributes all unmitigated impacts to the Revised Project (including impacts that occurred due to the Port's noncompliance); and (2) an emissions comparison of the Approved Project (with the 2008 mitigations timely in place) and the Revised Project (actual mitigation compliance levels and revised measures) during the years when the mitigation at issue was to be implemented but wasn't. The 2000–2001 baseline inventory and emission comparison scenarios described above could (and should) be generated using updated terminal activity levels, the latest emissions models, and updated OEHHA health risk guidance so that appropriate direct comparisons can be made.

More specifically, and by way of example, use of a 2000–2001 baseline could provide the following information that was not in the SDEIR:

- Full attribution of all the project's emissions to the Revised Project (by comparing pre-project conditions) so that the decision makers clearly understand the environmental consequences of the China Shipping terminal over the life of the project.

- An accounting of the excess emissions attributable to the Revised Project between, for example, 2004 and 2022. Currently, the SDEIR only compares the Approved and Revised Projects in 2014,[17] 2023, 2030, 2036 and 2045[18]—omitting the key period before 2014 and immediately after. The years between 2004 and 2022 are a critical time for analysis because this period includes the time when the approved mitigation measures were to kick in, and result in significant emissions benefits. For instance, the 2008 EIR forecast a 70% reduction in peak daily 2015 NOx emissions relative to the unmitigated scenario. *Compare* DEIR at Table 3.2-24 (NOx emissions without mitigation) *with id.* at Table 3.2-29 (NOx emissions with mitigation). [19]

[17] SDEIR Table 3.1-5 provides 2014 Unmitigated and Mitigated emissions. Based on the definition of these terms, SDEIR App. B at B1-4, subtracting these two scenarios results in the "excess emissions" for 2014.
[18] It appears that one can estimate excess emissions in future years by comparing Table 3.1-8 and Table 3.1-9, and subtracting emissions under the Revised Project scenarios from the FEIR Mitigated Scenario, which represents peak daily operational emissions assuming all 2008 EIR mitigations were fully and timely implemented, and increases in terminal throughput as shown in Table 2-3. SDEIR at Table 3.1-8, Table 3.1-9, and 3.1-47–3.1-48.
[19] The fact that the Port has performed the emissions comparisons for 2014 and some of the relevant future years with actual activity data and the latest models shows that the Port can run the requisite analysis in other years (e.g., pre-2014) but simply chose not to.

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Relatedly, we believe that between 2004 and 2022, the excess emissions from the Port's noncompliance may have exceeded CEQA significance thresholds for multiple years and for multiple pollutants. The SDEIR indicates that the Port's noncompliance resulted in 0.6 tons of excess peak daily NOx emissions in 2014, which is equal to about 1200 lbs. of NOx, and well above the significance threshold for action (only 55 lbs. NOx). SDEIR at Table 3.1-5; Table 3.1-6. Because the SDEIR employs a 2014 baseline, and focuses its air quality analysis on 2023–2045, the SDEIR does not identify possible exceedances before or shortly after 2014; but as noted, they did occur in 2014.

Exceedances may be more likely to occur in the 2004 to 2022 timeframe because after that time, fleets are expected to be cleaner in response to regulations, regardless of mitigation measures adopted for the project.[20] Stated differently, by focusing the SDEIR's air quality analysis on the Revised Project's emissions in 2023–2045, the Revised Project benefits from a cleaner fleet mix due to regulatory efforts. SDEIR App. B1 at B1-4 (defining Revised Project emissions scenarios as including future regulations). As a result, the Revised Project in 2023–2045 looks much cleaner than the 2014 baseline years, and appears comparable to the Approved Project in future years—not because the Revised Project includes extensive mitigation—but because regulations will decrease emissions across the board. If the air quality analysis disclosed emissions in 2004–2022, we would expect to see more years when operational emissions exceed significance thresholds, like they did in 2014. SDEIR Table 3.1-5, Table 3.1-6.

- A more honest assessment of health risks created by the project. The SDEIR analyzes health risks based on specific long-term exposure periods. SDEIR at B3-22 ("the cancer risk exposure periods were 30 years for residential and sensitive receptors, 25 years for occupational receptors, and 70 years for population cancer burden."). The SDEIR assumed the initial year of each project exposure period was 2015, the first year after the 2014 baseline year. *E.g., id.* at 3.1-32, 3.1-33 (describing exposure periods as 2015–2044, 2015–2039, and 2015–2084 for determining health risks). These exposure periods fail to include the excess emissions attributable to the Revised Project *before* 2014. An exposure period starting in, for example, 2001 would more accurately portray, what are likely to be, higher health risks generated by the project—prompting greater mitigation.[21]

[20] SDEIR at 3.1-44–45 (describing how regulatory requirements decrease emissions factors from most project sources between 2030 and 2045); *see also* CARB, Mobile Source Strategy (May 2016) at 22 ("existing ARB and district control programs are projected to reduce NOx emissions by over 50 percent between 2015 and 2031"), 32–36; STI Report at 9 (explaining how emissions models assume a large drop in vehicle emissions starting in 2023 due to state and federal regulations) (Attachment I1).
[21] While Appendix D may provide some comparisons between pre-project conditions and the Revised Project comparisons between 2005 and 2013 by comparing the "performance review" to the 2008 EIR CEQA baseline (2001), these comparisons are limited. They are only provided for 3 years (2005, 2010, and 2013). SDEIR App. D at 4–9. Comparisons are needed for the life of the project so that decision makers can understand the project's full consequences over its lifespan (the proposed lease extends to 2045). Additionally, Appendix D was not based on

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E. The SDEIR Fails to Provide an Adequate Justification for Using a 2014 Baseline

As acknowledged above, an agency has the discretion to use a baseline other than the norm established by CEQA Guidelines section 15125(a) if a justification is provided and supported by substantial evidence. The Port's justifications do not meet this standard.

The Port's rationale for using a 2014 baseline rests on the fact that air quality modeling techniques have been updated since the 2008 EIR. Chapter 2 of the SDEIR at 2-24, states:

> Changes in analytical and modelling techniques, as discussed in Sections 2.2.3 and 3.1, and Appendix B1, since 2008 for other impact analyses have made it unworkable or confusing to analyze impacts in this SEIR using a baseline drawn from data in the 2008 EIS/EIR. For these impacts areas, it was necessary to determine a different approach for evaluating the impacts of the Revised Project and to disclose the incremental change in environmental impacts between the Approved Project and the Revised Project. LAHD as determined that the most informative and appropriate approach is to adopt an alternative baseline for these analyses that represents existing conditions (2014) with full implementation of the 2008 Approved Project."

Similarly, in Chapter 3.1, the SDEIR at 3.1-3, states:

> Due to improvements in procedures and assumptions used to calculate emissions and in atmospheric dispersion modeling procedures used to estimate resulting pollutant concentrations and consequent health impacts (which together constitute the air quality impacts of the project), it is not possible to directly compare air quality impacts presented in the 2008 EIS/EIR for the Approved Project with impacts calculated for this Draft SEIR for the Revised Project, nor is it possible to reproduce the outdated methods, models, and procedures used to analyze air quality impacts in the 2008 EIS/EIR. Therefore, this Draft SEIR presents an evaluation of the air quality impacts for all of the baseline and future conditions scenarios described in the preceding paragraph using current, state-of-the-art emissions estimation, air quality modeling, and health risk procedures, including the 2015 OEHHA HRA Guidelines.

This "justification" may explain why the SDEIR may not rely on outdated projections and baseline scenarios in the 2008 EIR. It does not, however, explain why the SDEIR did not recreate the 2000–2001 baseline with updated methods and models, and compare pre-project conditions with the Revised Project so that the public and decisionmakers understand the environmental cost of the Revised Project. Nor does it explain why the SDEIR did not compare Approved Project and Revised Project scenarios based on updated activity and emissions data for

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updated emissions factors or dispersion modeling (or presumably updated health risk guidance), SDEIR App. D at 1, 2, 13, 15, and thus, is not an accurate predictor of the Revised Project's emissions or health risks. And as discussed in greater detail below, Appendix D fails to provide an apples to apples comparison between the Revised and Approved Projects based on updated activity data, air quality modeling, or health risk guidance for any years.

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the years between for example, 2004 and 2018 when the unfulfilled mitigation measures were to go into effect, and include this analysis as part of the Revised Project's incremental impacts.

Nor does the SDEIR contend that using a 2000–2001 baseline based on updated models would be misleading (especially if emissions comparisons of the Approved and Revised Project over the life of the project are provided), or that using a 2014 baseline will enhance public participation and more informed decisionmaking. *See Poet*, 12 Cal.App.5th at 80; *Neighbors*, 57 Cal.4th at 453. As detailed above, the 2014 baseline severs past, current, and near-term impacts from the project in violation of CEQA, and provides illusory conditions to compare the Revised Project against (conditions where some but not even all the mitigation measures are assumed to be in effect, *supra* at 11). It is not clear what, if any, informational value a 2014 baseline serves.

The SDEIR's baseline infects the Port's assessment of the Revised Project's operational emissions, offsite ambient air pollutant concentrations, assessment of mortality and morbidity from PM2.5, and toxic air contaminant exposure, as well as the Revised Project's contribution to cumulative air quality impacts. SDEIR at 3.1-39–65; 4-1317. Absent a full accounting of the emissions attributable to the Revised Project, the SDEIR fails to accurately predict the nature and severity of the Revised Project's air quality impacts, and the difference between the Approved and Revised Projects. In short, a 2014 baseline fails to give the public and decision makers "the most accurate picture practically possible of the project's likely impacts," and is contrary to CEQA's informational purpose. *See POET*, 12 Cal.App.5th at 79.

The Port must revise the SDEIR and adopt a 2000–2001 baseline.

II. THE SDEIR'S AIR QUALTIY ANALYSIS FAILS TO PROVIDE ENOUGH ACCURATE, RELEVANT, COMPREHENSIBLE INFORMATION TO PERMIT INFORMED DECISONMAKING AND PUBLIC PARTICIPATION

NRDC DSEIR-3

Port pollution creates a triple threat for the health of local communities. First, diesel emissions from port operations are toxic and significantly harm communities closest to the source of pollution. Second, the combustion of fossil fuels by port-serving vehicles and equipment emit large quantities of NOx pollution, which contributes to regional air pollution problems like ozone and fine particulate matter. Finally, freight transportation generates greenhouse gas emissions, which are expected to increase as the ports grow.

This "triple threat" disproportionately impacts low-income communities and communities of color that often live in close proximity to freeways, ports, railyards, and other facilities that generate significant levels of localized diesel exhaust.[22] As a result, these same communities experience higher asthma rates and other illnesses.[23] Emissions from the China Shipping terminal contribute to these impacts.

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[22] Arlene Rosenbaum et al., Analysis of Diesel Particulate Matter Health Risk Disparities in Selected US Harbor Areas, AM. J. PUB. HEALTH S217, S221 (2011) (Attachment F5).
[23] *See, e.g.,* San Pedro Bay Ports, Draft Final Clean Air Action Plan 2017 at 19 (July 2017), *available at* http://www.cleanairactionplan.org/documents/clean-air-action-plan-2017-draft-

NRDC DSEIR-3

The SDEIR shows that there were significant NOx emissions caused by the Port's failure to enforce the 2008 EIR mitigation measures—emissions that the Port ignores in analyzing future mitigation measures. But the document is grossly inadequate to provide the reader a clear picture of how big those past emissions were. Moreover, its future projections are dense, hard to follow and full of technical errors. In sum, the document fails its basic purpose to inform the public and decisionmakers of the environmental consequences of the proposed actions.

A primary purpose of CEQA is to: "[i]nform government decisionmakers and the public about the potential, significant environmental effects of proposed activities." Cal. Code Regs., tit. 14, § 15002, subd. (a)(1); *Pesticide Action Ctr. N. America v. Cal. Dept. of Pesticide Regulation*, No. A145632, 2017 WL 4130466 (Sept. 19, 2017). "If an EIR fails to include relevant information and precludes informed decisionmaking and public participation, the goals of CEQA are thwarted and a prejudicial abuse of discretion has occurred." *Save Our Peninsula Committee v. Monterey Cnty. Brd. of Supervisors*, 87 Cal.App.4th 99, 128 (2001). The SDEIR fails these tests both retrospectively and prospectively.

NRDC DSEIR-4

A. The Project's Past Emissions Are Under-Reported and Must Be Mitigated

The SDEIR shows that approximately 1200 pounds of excess peak daily NOx emissions occurred in 2014—emissions that would not have occurred had all the ASJ and 2008 mitigation measures been implemented. *See* STI Report at 2, SDEIR at Table 3.1-5. This figure is nearly 22 times higher than the SCAQMD threshold of significance.[24] Excess emissions of PM2.5, PM10, and VOCs also occurred. But, while we can assume that there were excess emissions throughout the 2004–2014 time period (and later), nowhere in the SDEIR is there a quantification of the volume of these emissions except possibly in 2023 through 2045.[25]

We define "excess emissions" as emissions that would not have occurred if the 2008 mitigations had been timely implemented. Appendix D appears[26] to view excess emissions (although it does not use that term), as emissions above those predicted in the 2008 EIR. Even under that latter definition, Appendix D—with all its faults—reveals that in 2013, there were higher levels of SOx than predicted in the 2008 EIR. SDEIR App. D at 8 (Table 6).

In that year, peak daily operational SOx emissions were 320 lbs. per day higher than projected in the 2008 EIR. *Id.* at 9 (Table 7). This level is more than double the significance threshold of 150

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document-final.pdf (Draft CAAP Update 2017)(Attachment C3); California Cleaner Freight Coalition, Vision for a Sustainable Freight System in California, at 11–14, *available at* https://www.ccair.org/wp-content/uploads/2016/01/CCFC-Vision-for-a-Sustainable-Freight-System-in-California.pdf (Attachment F6); South Coast Air Quality Management District, Final Report: Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES-IV) (May 2015), *available at* http://www.aqmd.gov/docs/default-source/air-quality/air-toxic-studies/mates-iv/mates-iv-final-draft-report-4-1-15.pdf?sfvrsn=7 (Attachment E14).

[24] The significance threshold for NOx is 55 pounds/day. *See* SDEIR at Table 3.1-6.

[25] Tables 3.1-8 and 3.1-9 may give information for those years, although that is less than clear.

[26] We emailed Port staff and asked for an explanation of what Appendix D Tables 2, 4, and 6 were meant to show, but received no explanation.

NRDC DSEIR-4

lbs. per day. *Id.* at 8 (Table 6). Accordingly, the SDEIR's own data reveals significant SOx emissions in 2013, but because the air quality analysis omits this year from its review, these impacts are not studied.

This is important because, as in the *POET* case, past emissions that occurred in violation of CEQA must be mitigated prospectively. In *POET*, the Court of Appeal found that the California Air Resources Board (CARB) had failed to account for or mitigate past NOx emissions associated with the increased use of biofuel, and sent the regulatory program there at issue back to CARB for further analysis, including future mitigations measures to account for the past excess NOx emissions. The China Shipping matter is directly analogous. This means that the SDEIR must contain an accurate and understandable calculation of the emissions, especially of NOx and PM, that occurred because the Port allowed, and sometimes fostered, non-compliance with eleven of the mitigation measures in the 2008 EIR, and must contain future mitigation measures to make up for those past emissions. But, aside from giving us a figure for 2014, it does not provide that needed information, and so violates CEQA.[27]

B. The SDEIR's Calculations of Future Emissions Are Inaccurate and Unreliable

NRDC DSEIR-5

The STI report identifies a list of mistakes in the SDEIR, so many that the SDEIR is essentially worthless. A redraft is needed to fix the technical issues described below and in the STI report, and a full, comprehensible emissions inventory beginning in 2000–2001 and continuing through 2050 (for GHG compliance purposes). The methodological errors in the SDEIR include the following:

1. Modeling Issues

Different, updated modeling programs were used for the 2017 SDEIR than for the 2008 EIR, making accurate comparisons problematic.[28] To compound this, in the "Performance Review" section of the SDEIR, Appendix D, updated modeling was not used although Appendix D purports to show differences among different mitigation scenarios.[29] To have "apples to apples" comparisons that make sense, the same modeling protocols should be used, as the SDEIR does, in Appendix D, with differences resulting from use of updated protocols pointed out where appropriate. Ideally, and to best promote the informational value of the document, we recommend that air quality impacts presented in the SDEIR reflect the use of current emissions models and protocols, and health risk guidance.

In addition, serious problems with underestimation of NOx emissions in EMFAC's treatment of port drayage emissions are identified in the STI report at footnotes 6 and 7, page 9. In summary, EMFAC substantially underestimates NOx emissions in the drayage duty cycle by a factor of 5 or more due to mistaken reliance on manufacturer testing that does not replicate real-world

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[27] As noted above, use of a 2000–2001 baseline would provide the framework for quantifying excess emissions before 2014; a 2014 baseline precludes it.
[28] For example, EMFAC 2007 was used in the 2008 EIR and EMFAC 2014 in the 2017 SDEIR.
[29] SDEIR App. D at 1.

NRDC DSEIR-5

conditions. This makes the SDEIR's future projections, as well as past inventories, highly suspect.

NRDC DSEIR-6

2. NOx and PM Emission Factors for Heavy Duty Trucks

These factors used in the SDEIR are contrary to published literature[30] and not properly justified, making the future truck emission projections unreliable. The SDEIR sets emission factors for diesel trucks equal to LNG trucks, which is factually incorrect, and moreover claims that emission factors for heavy-duty trucks will increase from 2023 to 2045 whereas in reality they are expected to decrease. This muddies the waters both with respect to an LNG versus diesel emissions comparison, and the expected future emissions from the Revised Project.

NRDC DSEIR-7

3. Future Emissions Benefits from AMP

These benefits are not consistently represented. The SDEIR projects future peak day emissions of NOx and PM associated with use of AMP to be roughly the same under both scenarios studied, but the average emissions are substantially different between the scenarios.[31] This makes no sense.

NRDC DSEIR-8

4. Cargo Handling Equipment Measures

The 2008 EIR itself is inconsistent in its analysis of cargo handling equipment mitigation measures, and this inconsistency carries over to the SDEIR. The 2008 EIR projections for 2010 show cargo handling equipment emissions for the mitigated scenario greater than those in the unmitigated scenario.[32] This violates common sense and infects the SDEIR's cargo handling equipment analysis as well.

NRDC DSEIR-9

C. Appendix D Does Not Tell Us What We Need to Know

SDEIR Appendix D is a curious document. Barely intelligible, it is apparently designed to show that historic emissions at China Shipping were lower than predicted in the 2008 EIR, so everyone should be happy.

But what is more significant is what Appendix D does not show: the difference between what actually happened at China Shipping and what should have happened given actual throughput and application of all 52 mitigation measures in the 2008 EIR. Under the analysis of the *POET* case described above, that calculation is critical to a full CEQA analysis, but is missing here. Below we explain why.

Here is what we think the authors of Appendix D did. As noted above, we asked for clarification of the methodology but none was given, and so what follows is our best guess. Take Table 4 for example, at Appendix D page 4. The left-hand column appears to present emissions data based on actual throughput with the mitigation measures actually in place—using the same emissions

[30] STI Report at 9, note 5 (Attachment I1).
[31] STI Report at 12–15, Figures 7–10.
[32] STI Report at 16, 17, Figures 11–12.

NRDC DSEIR-9

models used in the 2008 EIR.[33] The right-hand column appears to present the estimated emissions for that same year, using a 2001 baseline and then-projected (not real) throughput numbers, assumes timely implementation of the fifty-two 2008 mitigation measures, and appears to be cut and pasted from Table 3.2-20 in the 2008 EIR. The data in both columns do not reflect updated emissions modeling. Not surprisingly, given the drop in throughput compared to the 2008 EIR projections, the numbers in the left-hand column are lower than those in the right-hand column. This is why the Port suggests that everyone should be happy.

But—what is missing is a comparison of the 2010 actual figures with what should have happened in 2010 given real (not projected) throughput and all 52 required mitigation measures with updated modeling. Those numbers are what the local community had the legal right to expect and to insist on, and what *POET* requires the Port to disclose. But they are not present, nor are they present for 2005 and 2013, the other years charted in Appendix D. If they were, the numbers in the left-hand column would be higher than those in the right-hand column, and the difference would be the amount of excess emissions that *POET* requires the Port to calculate and mitigate.

NRDC DSEIR-10

D. The SDEIR Fails to Analyze Whether the Revised Project Will Conflict with or Obstruct Implementation of the 2016 AQMP

The South Coast air basin is classified under the federal Clean Air Act as in "extreme non-attainment" for ozone, better known to residents of the area as smog.[34] The main precursors of ozone in the lower atmosphere are NOx and VOCs. In its 2016 Air Quality Management Plan (AQMP), the South Coast Air Quality Management District (AQMD) attempts to demonstrate to the US Environmental Protection Agency (US EPA) how it intends to come into compliance by 2023, focusing on enormous reductions in NOx emissions in the region:

> The most significant air quality challenge in the Basin is to reduce nitrogen oxide (NOx) emissions sufficiently to meet the upcoming ozone standard deadlines. Based on the inventory and modeling results, 522 tons per day (tpd) of total Basin NOx 2012 emissions are projected to drop to 255 tpd and 214 tpd in the 8-hour ozone attainment years of 2023 and 2031 respectively, due to continued implementation of already adopted regulatory actions ("baseline emissions"). The analysis suggests that total Basin emissions of NOx must be reduced to approximately 141 tpd in 2023 and 96 tpd in 2031 to attain the 8-hour ozone

[33] *See* Appendix D, page 2, section 1.2 for what appears to be an explanation of this methodology.
[34] South Coast Air Quality Management District, 2016 Air Quality Management Plan, Executive Summary, *available at* http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/executive-summary.pdf?sfvrsn=4 (Attachment E12). This is with reference to the 75 ppb federal NAAQS, which has since been lowered to 70 ppb.

NRDC DSEIR-10

> standards. This represents an additional 45 percent reduction in NOx in 2023, and an additional 55 percent NOx reduction beyond 2031 levels.[35]

This is an enormous challenge. The AQMP relies heavily on reducing NOx emissions from the main sources of NOx in the area: mobile sources, mostly heavy-duty trucks, that cause 88% of the NOx emissions regionally.[36] Given the projected increase in port throughput estimated in the SDEIR, even with lower-NOx 2010 EPA certified diesel engines, the Port is not and will not be doing its fair share to help AQMD achieve the NOx reductions that it needs. For this reason, CARB and the South Coast AQMD are now considering implementing indirect source rules under the federal Clean Air Act that might force the Port to reduce or at least limit NOx emissions; not surprisingly, the Port opposes these measures.

The City of Los Angeles CEQA threshold guidelines require a CEQA document to examine nine possible air quality impacts, among which (AQ-8) whether the project would conflict or obstruct implementation of an applicable AQMP. In the SDEIR and the NOP for the China Shipping project, the Port disclaims a need for analysis of compliance with the 2016 AQMP, stating:

> Less Than Significant Impact. The FEIR concluded that construction and operation of the CS Container Terminal would not conflict with implementation of the 2003 AQMP (the then-current version) because the Port regularly provides SCAG with its Port-wide cargo forecasts for development of the AQMP. Therefore, the attainment demonstrations included in the 2003 AQMP accounted for the emissions generated by projected future growth at the Port. The FEIR further concluded that the attainment strategies in these plans include mobile source control measures and clean fuel programs that are enforced at the state and federal levels on engine manufacturers and petroleum refiners and retailers, and, as a result, operation of the CS Container Terminal would comply with these control measures. The South Coast Air Quality Management District (SCAQMD) also adopts AQMP control measures into the SCAQMD rules and regulations, which are then used to regulate sources of air pollution in the South Coast Air Basin. Therefore, compliance with these requirements would ensure that the proposed Project would not conflict with or obstruct implementation of the AQMP. These conclusions remain valid and this impact will not be addressed in the Supplemental EIR.[37]

This is incorrect for two reasons. First, it relies on the 2003 AQMP and ignores the 2016 AQMP, which is based on current conditions. Second, the SDEIR's proposed drayage plan—doing nothing—will lead to increased NOx emissions over what the LNG mitigation measure would have created and over what zero emission drayage trucks will create, and so contemplates increases in NOx while the AQMP needs a huge decrease in NOx. Indeed, as noted above, the SDEIR reveals that at least in 2014, there will be substantial increases in NOx from the Revised Project versus Approved Project conditions. That fact, in connection with an honest accounting of excess emissions in

[35] *Id.* at ES-2.
[36] *Id.* at ES-7; *see also id.* at 4-7 and Fig. 4-1.
[37] NOP at 12–13.

NRDC DSEIR-10

other near-term years, should be disclosed to the public and its significance analyzed in the SDEIR. The Port should not be allowed to hide from the public the contribution of the operation of the China Shipping terminal to the Southern California smog problem.

NRDC DSEIR-11

E. The SDEIR Fails to Assess Noncompliance with MMAQ-18 (DPFs for Locomotives)

The SDEIR appears to have excluded from analysis the Port's failure to timely implement MMAQ-18, which states "[b]eginning January 1, 2015, all yard locomotives at the Berth 121-131 Rail Yard that handle containers moving through the Berth 97-109 terminal shall be equipped with a diesel particulate filter (DPF)." FEIR at 3-52.

The main body of the SDEIR implies that the Port complied with this measure by excluding it from the list of measures that were not implemented. SDEIR at 2-3 (Table 2-1). However, Appendix D, which also assessed compliance with the 2008 mitigations states:

> There have been no DPF retrofits of yard locomotives. It is anticipated that newly manufactured locomotives beginning in 2016 and meeting Tier 4 locomotive emissions standards, will have DPF technology included as part of the original equipment manufacturers (OEM) design.

SDEIR App. D at 21; *id*. at 17–18 (explaining that for each mitigation measure, Appendix D compared the requirements of each measure by calendar year with the actual inventory data where possible).

If MMAQ-18 was not timely implemented, the SDEIR must be revised and recirculated to include a legitimate reason explaining the Port's noncompliance. *Napa Citizens For Honest Gov't v. Napa Cnty. Bd. of Supervisors*, 91 Cal.App.4th 342, 359 (Cal.Ct.App. 2001). Further, any noncompliance results in a project revision that was not analyzed in the SDEIR. The Port must address this error.

More fundamentally, this discrepancy calls into question whether there are other mitigation measures the Port did not timely implement. A subsequent study for this project should detail compliance with all 52 measures.

NRDC DSEIR-12

F. The SDEIR is Not Comprehensible to the Public or to Non-expert Decisionmakers

Over and above the technical and modeling errors described above, the SDEIR, and particularly Appendix D, are incomprehensible except perhaps to its authors. It is very difficult to understand how the document gets from A to B, especially in comparing past and future emission scenarios. We challenge a lay reader to study the tables in Section 3.1 and in Appendix D and describe simply what they mean and why. Techno-speak simply does not cut it for CEQA purposes, and so for that reason alone the documents must be redone.

NRDC DSEIR-13

III. THE SDEIR FAILS TO OVERCOME THE PRESUMPTION THAT THE 2008 MITIGATIONS ARE FEASIBLE, AND FAILS TO SET FORTH ALL FEASIBLE MEASURES TO REDUCE SIGNIFICANT OPERATIONAL EMISSIONS

Of the 52 mitigation measures adopted in the 2008 EIR, ten mitigation measures and one lease measure have not been fully implemented. SDEIR at 2-3 (Table 2-1). Of the unimplemented measures, 7 apply to operational emissions. The SDEIR seeks to modify or eliminate these air quality measures.

Under CEQA, a lead agency may not approve a project that will have significant environmental impacts unless it finds that alternatives and mitigation measures to reduce environmental impacts are infeasible based on specific economic, legal, social, technological or other considerations. Cal. Pub. Res. Code §§ 21002; 21061.1. "'Feasible' means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social and technological factors." *Id*. § 21061.1.

An agency may delete or modify a mitigation measure after an initial EIR is certified, but must state a legitimate reason for deleting the mitigation measure, supported by substantial evidence. *Napa Citizens*, 91 Cal.App.4th at 359. Courts will temper deference to agency decisions to delete a mitigation measure with the presumption that the mitigation measure was adopted only after "due investigation and consideration" in the initial environmental review process. *Id.* "The fact that a mitigation measure had been adopted in an earlier plan, but has been deleted, will be relevant to the question of the adequacy of the modified EIR, because it identifies a mitigation measure that the modified EIR then must address." *Id.* A mitigation measure "cannot be deleted without a showing that it is infeasible." *Id.* Finally, "the deletion of an earlier adopted measure should be considered in reviewing any conclusion that the benefits of a project outweigh its unmitigated impact on the environment." *Id.*[38] The SDEIR fails to overcome this presumption.

Our comments in this section (Section III) and the next (Section IV) are organized as follows: First we provide a summary of the factual record that undercuts the SDEIR's claims that the 2008 mitigation measures are not feasible. Second, we highlight text in the SDEIR, which seems to confirm that the 2008 mitigations are in fact feasible. Third, we explain how each of the original mitigations are feasible, and can be strengthened, as well as provide specific comments on the revised measures. Finally, we list additional measures the Port should consider in the SDEIR to mitigate the project's significant operational emissions.

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[38] *Napa Citizens* was decided in the context of a land use plan, and has since been applied to all CEQA projects. *See Lincoln Place Tenants Ass'n v. City of L.A.*, 130 Cal.App.4th 1491, 1509 (Cal.Ct.App. 2005); *see also Katzeff v. Cal. Dep't of Forestry and Fire Prot.*, 181 Cal.App.4th 601, 614 (Cal.Ct.App. 2010).

NRDC DSEIR-14

A. The Port's Infeasibility Arguments are a Litigation Artifact and Not Supported by the Record

Correspondence obtained through Public Records Act requests shows a frustrated Port and City Attorney disbelieving China Shipping's unsupported assertions that the 2008 mitigation measures were infeasible and demanding specifics, without success.

On February 17, 2015, the City Attorney wrote to counsel for China Shipping summarizing years of negotiations and specifically stating that China Shipping was "required to immediately implement" the mitigation measures identified in the 2008 EIR.[39] The City Attorney's letter contained a blunt threat:

> In the event a third party files a legal action challenging China Shipping's failure to comply with the mitigation measures, there is a strong possibility that the court will issue an order enjoining or otherwise affecting China Shipping's operations. Under California law, a court has broad authority to stop activities that it determines are against the law, are detrimental to the environment or violate a court order. These remedies are separate from and are not related to any rights or agreements between the Port and China Shipping. *The Court can issue any of these orders, including the complete shut-down of all activities at the site, without regard to the provisions of the Permit No. 999.* [Emphasis added]

On February 25, 2015, China Shipping replied and claimed it was fully compliant with the mitigation measures for ships, including the AMP and VSR measures. The letter went on to provide brief unsupported assertions that "immediate" replacement of certain cargo handling equipment was not economically feasible "at this time," and generally asserted that the LNG truck measure was not economically feasible.[40]

On March 3, 2015, the City Attorney replied to the China Shipping letter[41] and pointed out that the claim of infeasibility was late in the game:

> On the overall issue of economic infeasibility, China Shipping had the opportunity to present comments and evidence of economic infeasibility of these [mitigation] measures during the environmental review process, but chose not to do so.

Nonetheless the City Attorney invited China Shipping (again) to provide information regarding infeasibility on economic grounds or otherwise if circumstances had changed. On March 25, 2015, China Shipping replied, again, with few specifics.[42] Perhaps tiring of this, on April 16,

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[39] Attachment A30.
[40] Attachment A31.
[41] Attachment A32.
[42] Attachment A33.

NRDC DSEIR-14

2015,[43] June 12, 2015,[44] and October 19, 2016,[45] the City Attorney and Port wrote to China Shipping asking for more information.

On December 30, 2016, China Shipping wrote to the City Attorney and claimed that it needed more time to respond.[46] By that point, the September 18, 2015 NOP in this matter had been on the street for over a year. On January 17, 2017, the Port Executive Director Eugene Seroka again wrote to China Shipping[47] stating that:

> With respect to the SEIR, POLA has made several requests for data and information from China Shipping to assist POLA in preparation of the SEIR. To date, POLA has received only partial responses from China Shipping . . . China Shipping has not proposed any modifications to make currently required mitigation measures feasible nor provided alternative measures that could address the identified environmental impacts. This response is not satisfactory.

Mr. Seroka went on to say that the Port was proposing certain changes to the mitigation measures for analysis in the SEIR, and that:

> [I]t is incumbent on China Shipping, as the tenant, to comment on the feasibility of the measures proposed. Failure to do so is solely the responsibility of China Shipping.

On January 25, 2017, China Shipping responded that it would address the SEIR and environmental matters "in the near future."[48] No documents after that date were produced in response to our Public Records Act requests for documents relating to the China Shipping mitigation measures, and so we must assume that China Shipping never provided Mr. Seroka with additional information demonstrating potential infeasibility. China Shipping also did not appear to have commented on the NOP for the SDEIR.[49]

These facts show a lack of substantial evidence demonstrating infeasibility, and cast the SDEIR as an attempt to rationalize the Port and China Shipping's noncompliance.

Below, in sections B though F, we further document how the 2008 mitigation measures are in fact, feasible.

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43 Attachment A35.
44 Attachment A62.
45 Attachment A67 (POLA001634–35).
46 Attachment A63 (POLA001471–74).
47 Attachment A63 at POLA001475–81.
48 Attachment A65 at POLA001587.
49 SDEIR at Table 1-3 ("Summary of Key NOP Comments").

NRDC DSEIR-15

B. The SDEIR Concedes that the 2008 Mitigations are Feasible by Stating that if the Revised Project is Rejected, the Original 2008 Mitigations will be Enforced

When explaining the discretionary decision before the BHC, the SDEIR states:

> With respect to air quality, *if the Board does not approve the Revised Project, the CS Container Terminal could remain in operation under the original mitigation measures for air quality and greenhouse gas emissions.* As analyzed in the 2008 EIS/EIR, the impacts remaining after implementation of the previously approved mitigation measures would be less severe than the impacts of the Revised Project. Thus, allowing the previously approved measures to remain in place would avoid an incremental increase un the severity of impacts caused by the proposed changes. **. . .** Consequently**,** *if the Board does not approve the Revised Project, the environmental impacts determined in the 2008 EIS/EIR for the CS Container Terminal would still remain and the previously approved mitigation measures would still be required*.

SDEIR at 1-31 to 1-32 (emphasis added). The SDEIR goes on to state that if the Board rejects the Revised Project, the Port would be responsible for enforcing the previously adopted measures, and could pursue a separate proceeding against China Shipping to enforce them. SDEIR at 1-32. Such statements run counter to the SDEIR's position that the unfulfilled measures adopted in 2008 are infeasible. Either the measures are infeasible, and cannot be implemented or enforced; or the measures are feasible and the Board of Harbor Commissioners can move forward with the Project as envisioned in 2008 by implementing and enforcing all 52 mitigation measures certified in the China Shipping EIR.[50]

C. The 2008 AMP Measure (MM AQ-9) is Feasible

NRDC DSEIR-16

The SDEIR does not overcome the presumption that the 2008 EIR's AMP measure (MM AQ-9) is feasible, and thus goes backwards for no legally valid reason. **The Port should maintain a 100% compliance rate with the Port's AMP requirement as envisioned in the 2008 EIR, and if necessary, allow vessel operators to comply with an alternative emissions control system.**

In the 2008 FEIR, MM AQ-9 required that China Shipping ships calling at Berths 97-109 use AMP in the following percentages while hoteling in the Port.

- Jan–Jun 2005: 60%
- July 2005: 70%
- Jan 2010: 90%
- Jan 2011: 100%.

[50] We understand that if the 2008 measures are deemed substantively feasible (e.g., 100% ships can use AMP and comply with VSR), some of the deadlines for the measures have past, and would still need to be re-set.

NRDC DSEIR-16

MM AQ-9 also required that by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at a 100 percent compliance rate, except for circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship.[51]

The SDEIR's revised measure reduces the percentage of vessel calls that must comply with AMP to 95%, and provides that if one or more of several exceptions exist, vessel operators can utilize an equivalent alternative at-berth emissions control caption system if feasible in lieu of AMP. SDEIR at 2-13.

None of the reasons cited in the SDEIR overcome the presumption that a 100% compliance rate with AMP is feasible (we acknowledge, of course that the deadline for that compliance—2011—is no longer feasible). The explanation provided is not based on data from China Shipping or its successors that the 100% AMP requirement is infeasible for its vessel operations, and instead appears to be speculative, generalized, and provided by the Port.

As discussed above, the Port privately granted waivers to China Shipping from the Project's AMP requirements (MM-AQ 9)—including when it served its financial interests to do so,[52] never secured an amended lease with China Shipping that included the 2008 mitigation measures, SDEIR at 1-8, and took no action against China Shipping to enforce the mitigation measures even as deadlines came and went. It appears that measures like MMAQ-9 became "infeasible" due to the own Port's failure to timely implement and enforce them, not due to any economic, legal, social, or technological reasons. *See* CEQA Guidelines § 15091.

NRDC DSEIR-17

Further, the SDEIR's claim that the 100% AMP requirement should be relaxed to 95% is contrary to other port projects. For example, Middle Harbor at the Port of Long Beach has had a 100% AMP requirement since December 2014.[53] And 100% of vessel calls at the Port's Trapac terminal are set to use AMP starting January 2018, per the certified Final EIR/EIS for that

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[51] FEIR Mitigation Monitoring and Reporting Program at 2-13.

[52] *See supra* note 3 (citing 5 waivers). One of the waivers was granted after China Shipping told the Port in late November 2011, that it entered a deal that would shift 800 TEUs weekly from Long Beach to Los Angeles, and to meet the volume increase, it would need to use larger vessels that were not AMP-equipped (the smaller vessels China Shipping was using at the time were AMP-equipped). The Port granted China Shipping a waiver from the AMP requirement about two weeks later. Email from Z. Bing to K. McDermott (Nov. 25, 2011) (Attachment A69 (POLA001727)); Email from K. McDermott to Z. Bing (Dec. 12, 2011) (Attachment A69 (POLA001742)).

[53] Middle Harbor FEIR at ES-32 (Table ES 8-1) (April 2009) (Attachment C12) ("Mitigation Measure AQ-5: Shore-to-Ship Power ("Cold Ironing"). All OGV that call at the Middle Harbor container terminal shall utilize shore-to-ship power while at berth according to the following schedule: (1) 33 percent of all OGV by December 2009 (2) 66 percent of all OGV by March 2012, and (3) 100 percent of all OGV by December 2014. Lease stipulations shall include consideration of alternative technologies that achieve 90 percent of the emission reductions of cold-ironing.").

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project.[54] The SDEIR does not explain why a 100% AMP requirement is *in*feasible at the China Shipping terminal when shipping lines have been—and are increasingly planning to—comply with the same requirement and the Port of Los Angeles and the Port of Long Beach.

Regardless, even if the 100% AMP requirement is somehow infeasible, the Revised Measure must be strengthened to meet the Port's CEQA obligation to adopt all feasible mitigation measures. Indeed, the reasons listed in the SDEIR for why MM AQ-9 is infeasible all relate to why achieving 100% compliance with *AMP* is not possible. SDEIR at 2-12–2-13. The SDEIR does not, however, explain why 100% of ships could not use AMP *or* an alternative emissions control technology, and in fact promotes the use of such alternative technologies when AMP is not used. *Id.* Accordingly, the SDEIR could consider a measure where by 2018, 100% of ships at dock are mitigating at-berth emissions with either shore power or an alternative emissions control system. Limited exceptions could be granted for emergencies.

This recommendation is supported by recent comments submitted by the State of California on the Port's Everport project. In its comments, CARB urged the Port to require a 100 percent shore power compliance rate from vessels equipped with short power, and alternative capture and control systems for all ships that are not equipped to use shore-based electricity.[55]

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Finally, the SDEIR claims that "the Port does not have the authority to impose any specific emissions reduction technology on OGVs as they are internally flagged vessels subject only to IMO regulations." SDEIR at 3.1-45. This is an inaccurate statement of the law given the Port's authority as a landlord to impose lease conditions on its tenants, including China Shipping, and is contrary to the authority the Port proposes to assert under its revised measures for ships.

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[54] Mitigation Measures: Berth 136-147 [TraPac] Container Terminal Project EIR (FEIR Mitigation List) at 4, *available at* https://www.portoflosangeles.org/EIR/TraPac/FEIR/FEIR_Mitigation_List.pdf (Attachment C14) ("MM AQ-6: AMP. Ships calling at Berth 136-147 shall use AMP while hoteling at the Port in the following at minimum percentages: (a) 2009: 25% of ship calls; (b) 2010: 50% of ship calls; (c) 2012: 60% of ship calls; (d) 2015: 80% of ship calls; and (e) 2018: 100% of ship calls. Additionally, by 2010, all ships retrofitted for AMP shall be required to use AMP while hoteling at 100 percent compliance rate, with the exception of circumstances when an AMP-capable berth is unavailable due to utilization by another AMP-capable ship."). As of the date of this comment letter, it is our understanding that Trapac is in full compliance with the measures outlined in its FEIR.

[55] Letter from E. Yura, CARB, Chief, Emissions Assessment Branch Transportation and Toxics Division, to C. Cannon, City of Los Angeles Harbor Department and T. Stevens, U.S. Army Corps of Engineers (June 5, 2017) (commenting on the Everport Container Terminal Project Draft EIR) (Attachment E6). CARB's push for a 100% compliance rate is consistent with its March 2017 resolution wherein it directed its staff to "within 18 months. . . develop At-Berth regulation amendments that achieve up to 100% compliance by 2030 for LA Ports." CARB, Resolution 17-7, 2016 State Strategy for the State Implementation Plan (March 23, 2017), available at https://www.arb.ca.gov/planning/sip/2016sip/res17-7.pdf (Attachment G1); *see also* Attachments D1-D2, G4 (CARB certification of at berth alternative control systems).

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Given the number of vessels that are anticipated to visit the terminal, the length of time these larger vessels will be docked for offloading, and the amount of emissions released while vessels are at berth, requiring 100% of vessels to mitigate at-berth emissions would meaningfully reduce operational emissions.

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D. The 2008 VSR Measure (MM AQ-10) is Feasible

The Port should maintain a 100% compliance rate with the Port's vessel speed reduction program, as envisioned in the 2008 EIR.

The 2008 EIR, MM AQ-10, required that starting in 2009, 100% of ocean going vessels calling at the China Shipping Container Terminal comply with the Port's VSR program within a 40 nm radius of Port Fermin.[56] The SDEIR purports that a 100% compliance rate is infeasible, and proposes to revise the measure to require 95% compliance starting in 2018.

The SDEIR asserts that vessels cannot achieve a 100% compliance rate because of vessel schedules, weather, port delays, mechanical problems, and the need to maintain economic competitiveness. SDEIR at 2-14, 2-15. These reasons, however, are generically asserted. The SDEIR does not point to any data or statements from China Shipping validating the Port's infeasibility claims, or analysis finding that the original VSR requirements would render China Shipping's operations economically impracticable. Further, nothing has changed since 2008 that would have rendered the VSR measure feasible in 2008 and infeasible now.

Moreover, the Port's own data and data from its neighbor, the Port of Long Beach, demonstrate that a 100% compliance rate is achievable. For example, the Port's website indicates the China Shipping Terminal was 100% complaint with the Ports VSR program at both 20 nm and 40 nm in 2016.[57]

And data from the Port of Long Beach, which also operates a VSR program, demonstrates that in 2016, 113 vessel operators achieved 100% compliance with Long Beach's VSR program within the 40 nm zone.[58] One of these vessel operators was China Shipping Container Lines, while

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[56] FEIR Mitigation Monitoring and Reporting Program at 2-13.

[57] Port of Los Angeles, Vessel Speed Reduction Compliance (2016), *available at* https://www.portoflosangeles.org/environment/progress/wp-content/uploads/2017/01/VSR-Graphic-1-4-2017-2.pdf (Attachment C6).

[58] Port of Long Beach, Green Flag Incentive Program Operator Compliance Monthly Report (1/1/2016–12/31/2016), *available at* http://www.polb.com/civica/filebank/blobdload.asp?BlobID=13769 (Attachment C7). Long Beach has a voluntary, incentive based program that rewards vessel operators for slowing down to 12 knots or less within 40 nautical miles (nm) of Point Fermin. Port of Long Beach, Green Flag Incentive Program, *available at* http://polb.com/environment/air/greenflag.asp (Attachment C8). In some instances, however, such as for tenants at the Port of Long Beach's Middle Harbor property, VSR is a mandatory lease requirement. Given that the VSR programs at both ports are largely a voluntary incentive based program, operators can elect not to participate in the

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another was Yang Ming (one of the shipping lines that uses China Shipping's terminal). *Id*.; SDEIR at 2-12.

The Port of Long Beach has also certified environmental impact reports requiring 100% compliance with VSR. The Middle Harbor project required 100% compliance by 2014.[59] And the tenant at Middle Harbor, Orient Overseas Container Lines (OOCL), had a 100% compliance rate with VSR in 2016.[60]

Recent comments by the State of California on the Port of Los Angeles' Everport DEIR/DEIS also indicate that the Port should adopt a VSR measure that requires compliance beyond 95%.[61] In CARB's comments, the agency noted that the terminal's vessels were already meeting an above 95% compliance rate in recent years, and thus, the Port should propose further mitigation to achieve additional emissions benefits.[62] Similarly, vessels serving the China Shipping Container Terminal had a 96% compliance rate within 40 nm in 2014, and as stated, 100% compliance in 2016. SDEIR at Table 2-1.[63] Accordingly, actual operations at the China Shipping terminal demonstrate that the revised measure's 95% compliance rate must be strengthened to comply with CEQA.

For the above reasons, the SDEIR fails to overcome the presumption that a 100% compliance rate for VSR is feasible, and has not demonstrated that a 95% compliance rate satisfies the Port's obligation to adopt all feasible mitigation measures.

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Finally, the revised VSR measure envisions that a vessel operator shall either comply with VSR 95% of the time, or "comply with an alternative compliance plan approved by the Port for a specific vessel and type." SDEIR at 2-15. The Revised Measure goes on to state that the alternative compliance plan shall demonstrate that it will "achieve emissions reductions comparable to or greater than those achieve by compliance with the VSRP." *Id*. In theory, we support providing compliance options to vessel operators that can achieve equivalent emissions reductions. The SDEIR, however, does not provide any details on what might be included in the alternative compliance plan. Thus, there is no way for the public to provide input on whether

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program. Thus, the number of vessel operators cited as in 100% compliance with the program at the Port of Long Beach could be higher if the VSR requirements were mandatory.

[59] Port of Long Beach Middle Harbor FEIR, Table ES.8-1, *available at* http://polb.com/civica/filebank/blobdload.asp?BlobID=6227(Attachment C12 ("Mitigation Measure AQ-4: Expanded VSRP. All OGV that call at the Middle Harbor container terminal shall comply with the expanded VSRP of 12 knots from 40 nm from Point Fermin to the Precautionary Area.").

[60] Port of Long Beach, Green Flag Incentive Program Operator Compliance Monthly Report, 1/1/2016–12/31/2016, *available at* http://www.polb.com/civica/filebank/blobdload.asp?BlobID=13769 (Attachment C7).

[61] Letter from E. Yura, CARB, Emissions Assessment Branch Chief, Transportation and Toxics Division, to C. Cannon, City of Los Angeles Harbor Department and T. Stevens, U.S. Army Corps of Engineers at 5 (June 5, 2017) (Attachment E6).

[62] *Id.*

[63] *See also supra* Port of Los Angeles, Vessel Speed Reduction Compliance at note 57.

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those alternative measures are equivalent to VSR in terms of emissions reductions, or if they have unintended impacts, such as increasing the likelihood of whale strikes. The SDEIR must include such information.

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E. The Cargo Handling Equipment Measures (MM AQ-15, AQ-16, AQ-17) Are Feasible, and Can Be Strengthened to Require Utilizing Zero Emission Technologies

The SDEIR does not overcome the presumption that the 2008 EIR mitigation measures for cargo handling equipment are feasible, and weakens the measures without providing a legally valid reason for doing so. The SDEIR also fails to consider the full range of feasible mitigation measures for its revised cargo handling equipment mitigation measures. **In general, the cargo handling equipment mitigation measures should be revised to require accelerated deployment of zero emission cargo handling equipment, achieving 100% zero emission cargo handling equipment by 2030 at the latest.** These comments address the mitigation measures for each category of cargo handling equipment in turn.

Local and state entities have sent clear signals to the ports that zero emission cargo handling equipment technologies must be implemented in the near term. The Mayors of Los Angeles and Long Beach issued an executive directive four days before the release of the SDEIR, setting a goal that the ports fully implement all zero emission cargo handling equipment by 2030. The goal of 100% zero emission cargo handling equipment by 2030 is also required by the Draft CAAP Update 2017, which has emphasized that accelerated deployment of currently available zero emission technologies is critical to achieving this ambitious equipment turnover. Further supporting this goal, CARB adopted a resolution in March 2017 directing staff to develop regulations for cargo handling equipment to achieve up to 100% zero emissions by 2030.[64]

First, as explained in detail in these comments, the mitigation measures for cargo handling equipment set forth in the 2008 EIR are feasible. Second, and in accordance with CEQA's mandate to consider all feasible mitigation measures, the SDEIR can and should incorporate enhanced mitigation measures that will achieve the zero emission future envisioned by the Mayors, San Pedro Bay Ports, and CARB. The project should include a mitigation measure that requires all zero emission cargo handling equipment by 2030, and should deploy zero emission equipment much more rapidly where it is feasible to do so. The project should also contain a strong plan to develop the electric infrastructure necessary to support zero emission technology. Finally, the project should be revised to implement additional zero emission technology demonstration projects. [65]

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[64] CARB, Resolution 17-7, 2016 State Strategy for the State Implementation Plan (March 23, 2017), *available at* https://www.arb.ca.gov/planning/sip/2016sip/res17-7.pdf (Attachment G1).
[65] In numerous documents, the Port has emphasized the critical importance of technology demonstrations as a step to emissions reductions. Conducting demonstration projects would also align with one of the key strategies of the 2017 draft update to the San Pedro Bay Ports' Clean Air Action Plan, which plans to support implementation of CARB's 100% zero emission cargo handling equipment regulation by "demonstrating new technologies, accelerating deployment through a concerted funding strategy, and accelerating requirements through leases where

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Many types of zero emission cargo handling equipment are commercially available and currently operating in several terminals at the Ports of Los Angeles and Long Beach. There are already 333 pieces of zero emission cargo handling equipment operating at the Ports of Los Angeles and Long Beach, and planned projects boost the number to 573 by 2025.[66] Specifically, zero emission cargo handling equipment used at the Trapac and Middle Harbor terminals demonstrate that in addition to reducing diesel emissions and greenhouse gases, replacing diesel fueled cargo handling equipment with high density automated electrified equipment can result in significant efficiency gains.[67] This has been shown to lead to cost savings, allows terminals to handle increased cargo volumes, and results in lowered truck turn times.[68] Our understanding is that the Trapac terminal has maintained the same level of jobs with electrification and automation. With that said, we strongly encourage that efforts to automate terminals be coupled with workforce development and training so that workers can transition to new jobs to support the new technologies. In short, zero emission cargo handling equipment is not only technologically feasible, it also increases efficiencies and profits, and is compatible with job retention.

Thus, as a first step, the SDEIR should study the terminal operations at Trapac and Middle Harbor, account for the types of equipment utilized at those terminals (which we understand is nearly 100% electric), and set forth similar measures for this project.

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i. The 2008 Electric Rubber-tired Gantry Crane Measure (MM AQ-17) Is Feasible.

The 2008 EIR MM AQ-17 required that all rubber-tired gantry cranes shall be electric by January 1, 2009. Today, eight years past the deadline, none of the rubber-tired gantry cranes (RTGs) are fully electric. The SDEIR's revised measure requires only four electric RTG cranes to be installed by 2025—nearly 80% short of the initial requirement, to be implemented 16 years late. It also requires some of the RTG cranes to be replaced with diesel-electric hybrids. It is unclear how many hybrids would be required under the new measure.[69] As discussed below, the

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possible." 2017 Draft Clean Air Action Plan Update at 41. To the extent that certain types of zero emission terminal equipment are not yet commercially available or proven in widescale deployment, the Port should require near-term demonstration projects for those pieces of technology, requiring replacement with zero emission technologies contingent on the success of those projects. Or, the measures could tier from demonstration projects that are currently happening at other terminals, and require replacement of equipment with zero emission technologies once those projects are completed successfully.

[66] 2017 Draft Clean Air Action Plan Update at 44, Table 3.

[67] Electrification of cargo handling equipment does not necessarily require automation.

[68] JOC.com, "LA-LB terminals, carriers try to ensure ports' green plan doable," *available at* https://www.joc.com/port-news/us-ports/la-lb-terminals-carriers-try-ensure-ports-green-plan-economically-feasible_20170309.html (Attachment H4); JOC.com, "Automation halves truck turn times at Long Beach port terminal," *available at* https://www.joc.com/port-news/us-ports/port-long-beach/automation-halves-truck-turns-times-long-beach-port-terminal_20160531.html (Attachment H5).

[69] The SDEIR offers inconsistent accounts of how many RTGs operate at the terminal, and does not specify which RTGs would be replaced. Table 2-5 lists a total of 19 RTGs, but only provides

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SDEIR does not overcome the presumption that the 2008 EIR's electric RTG measure is feasible. **The Port should maintain the requirement to replace all RTGs with fully electric, zero emission RTGs, and should install 5 zero emission RTGs by 2018, 5 additional zero emission RTGs by 2020, and replace the rest of the RTGs with zero emission RTGs by 2023.**

In order to delete or modify a mitigation measure, an agency must state a legitimate reason supported by substantial evidence. The SDEIR does not offer sufficient evidence to explain why the original mitigation measure for RTGs was never implemented. To the contrary, the Port admits that it is feasible to install at least four additional electric RTGs today—the SDEIR states that the infrastructure currently exists to support four electric RTGs in the surcharge area.[70] The Port fails to explain why it has delayed in installing these four electric RTGs in the surcharge area, despite acknowledging that this installation was clearly feasible. According to a draft evaluation of compliance status updated in September 2014, the WBCT had plans to replace existing diesel-powered RTGs with five electric RTGs and five hybrids by the end of 2014.[71] The Port does not acknowledge these plans in the SDEIR nor do they explain why these plans were abandoned.

Moreover, the Port's reasoning for changing the mitigation measure does not overcome the presumption that replacing all of the RTGs with zero emission electric RTGs is feasible. And in fact, while the Port failed to meet its mitigation obligation by requiring electric RTGs, the Long Beach Container Terminal proved the feasibility of this measure by installing, testing, and initiating full-scale operation of electric RTGs at their new terminal located at the nearby Port of Long Beach.

The Port does not provide any evidence to support its vague statements that terminal configuration, costs, and space constraints make the measure infeasible. In addition, the Port fails to explain what makes implementation of electric RTGs infeasible *now* as compared to when the final EIR was certified in 2008. Was the terminal previously configured in a way that could have accommodated all-electric RTG cranes? Could the terminal have been developed in a way to make the configuration work differently or to provide the infrastructure to support

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model years for 18 RTGs. SDEIR at 2-17. In another place, the SDEIR reports that there were 13 RTGs operating at the terminal in 2014. SDEIR at 2-16. By contrast, the 2008 Final EIR contemplated a total of 10 all-electric RTGs operating at the terminal. *See, e.g.,* 2008 FEIR Figure ES-2, p. 3-5. The types of technologies reported are also inconsistent: on one page the SDEIR reports that there are currently two hybrid diesel-electric RTGs operating at the terminal, and on another page reports that there is only one hybrid operating. *Compare* SDEIR at 2-16 *with* SDEIR at 2-4. The Revised AQ-17 would require replacement of RTG model years 2004 and older, and one model year 2005 RTG with diesel-electric hybrids. The Port should clarify these inconsistencies, and add information about how many total RTGs will be operating at the port and what they will be replaced with.

[70] SDEIR at 2-17, 3.1-46.

[71] Draft Evaluation of Compliance Status and Compliance Cost for Mitigation Measures for China Shipping Terminal (Nov. 20, 2013, revised Sept. 29, 2014) (Attachment A21 at POLA000812-13).

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electrification? How much did delay in implementation contribute to today's cost estimates of compliance? The Port must answer these questions to overcome the presumption that the requirement to install all-electric RTG cranes was, and still is, feasible.

When the 2008 Final EIR was certified, only four RTG cranes were in operation at the terminal. MM AQ-17 required that all RTGs be replaced with electric RTGs by 2009. Yet, following certification of the Final EIR, the terminal purchased a number of new, non-compliant cranes, purchasing at least two new non-compliant cranes with model years 2011 and 2013.[72] The Port must explain why new diesel cranes were purchased instead of electric cranes, in flagrant violation of the 2008 Final EIR.

Further, to the extent that these newer, noncompliant purchases increase the costs of electrification today (because they would require replacing the cranes before the end of their useful life), the Port may not use the additional costs incurred to argue infeasibility. In addition, the record shows that the Port paid China Shipping at least $22 million to offset the costs of complying with the ASJ.[73] Any cost estimates from China Shipping related to complying with air quality mitigation measures or claims of competitive disadvantage should take these contributions into account.

The presumption that installing all-electric RTG cranes is feasible is bolstered by a plethora of evidence that electric RTGs are commercially available and relatively inexpensive substitutes for diesel. CARB has recognized that electric rubber-tired gantry cranes are a "commercially available, mature technology for container handling."[74] There are at least five commercially available grid electric RTG models, and at least five commercially available grid electric retrofits.[75] Electric RTGs have been in-use at foreign ports since 2002, and are currently in-use at domestic ports.[76] To give one example, the Port of Long Beach is repowering nine rubber-tired gantry cranes to full electric power.[77]

Electric RTGs are not only commercially available, they are also relatively inexpensive replacements for diesel. Electric-powered RTGs are only about 10 percent more expensive than diesel models.[78] The operating cost benefits of electric RTGs are significant because they result

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[72] SDEIR at 2-17, Table 2-5. As explained in the prior footnote, the exact number and type of RTGs operating at the terminal is unclear.
[73] Attachment A68 at POLA001715 (describing $22 million contribution to China Shipping); Attachment A68 at POLA001722 (describing multi-million dollar payments to China Shipping to cover the costs of e.g., yard tractors and rubber tired gantries).
[74] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment, III-11, table III-2 (2015), *available at* https://www.arb.ca.gov/msprog/tech/techreport/che_tech_report.pdf (Attachment E2).
[75] *Id.*; *see also* Attachment J8 (zero emission RTG by Kalmar).
[76] *Id.* at III-12.
[77] Draft CAAP Update 2017 at 43.
[78] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-12.

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in maintenance cost savings and provide significant reductions in energy usage, on the order of 60 percent compared to diesel-fueled cranes.[79]

For the above reasons, the SDEIR fails to overcome the presumption that requiring replacement of all RTG cranes at the terminal with zero emission RTGs is feasible.

ii. The Yard Tractor Measures (MM AQ-15 and AQ-17) are Feasible, and Can Be Strengthened to Require Zero Emission Yard Tractors

NRDC DSEIR-23

The Port fails to overcome the presumption that the 2008 EIR mitigation measures for yard tractors are feasible. Moreover, the Port has failed to consider all feasible mitigation measures in revising its technology requirements for yard tractors. **The Port should strengthen MM AQ-15 to require the terminal to transition to all zero emission yard tractors.**

The 2008 EIR MM AQ-15 required that all yard tractors run on alternative fuel beginning in September 2004 (as required by the ASJ) through the end of 2014, and that by 2015 all yard tractors utilize cleanest available NOx engines meeting 0.015 gm/hp-hr for particulate matter.[80] MM AQ-17 required that China Shipping participate in an electric yard tractor pilot project, requiring them to deploy two electric yard tractors within one year of lease approval and, if the program was deemed successful, to replace half of the terminal's tractors with electric tractors within five years.

The project did not achieve the alternative fuel requirement until four years after the ASJ deadline.[81] Today, none of the yard tractors meet the engine requirement, and the electric yard tractor pilot project has not been implemented. The yard tractors also fail to meet the 2010 deadline to achieve Tier 4 engine standards under CAAP Measure SPBP-CHE1.[82]

The SDEIR's Revised Measures delete the electric yard tractor pilot project, and push back the engine requirement compliance deadline by eight years, to 2023. The Port states no legally valid reason for making these changes, and fails to overcome the presumption that the original measures are feasible.

The SDEIR silently glosses over the deletion of the 2008 EIR requirement for deploying an electric yard tractor pilot project, without even attempting to provide a reason or explanation for the deletion. The record gives us no reason to believe that the demonstration project was infeasible. Communications between representatives of China Shipping and Los Angeles dated March 25, 2015 stated that WBCT would be able to participate in a one-year pilot project if a

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[79] *Id*. at III-13.
[80] FEIR Mitigation Monitoring and Reporting Program at 2-14.
[81] About 60 percent of tractors did not comply with this ASJ requirement until 2008, almost four years later than the 2004 deadline. SDEIR App. D at 20, Table 17 (showing that only 40-42% of tractors were in compliance with the alternative fuel requirement between 2005 and 2008).
[82] San Pedro Bay Ports, Clean Air Action Plan 2010 Update, at 128 (Oct. 2010), *available at* http://www.cleanairactionplan.org/documents/2010-final-clean-air-action-plan-update.pdf (Attachment C1) ("CAAP Update 2010").

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suitable tractor could be found, and failed to explain why it had not been implemented yet.[83] Suitable tractors were available at that time, and were being used at other terminals and facilities.[84] Successful implementation of the electric yard tractor pilot project would have resulted in half of the terminal's yard tractors being replaced with zero emission yard tractors, significantly reducing terminal emissions. Furthermore, as the San Pedro Bay Ports have stated in numerous reports and studies, demonstration of zero emission technologies is an important step to accelerating deployment of emissions reducing technologies, creating markets, and sending demand signals to manufacturers.[85]

NRDC DSEIR-24

The Port also fails to explain why the yard tractor engine requirement was not met, and fails to state a legitimate reason for extending the deadline to 2023. The Port argues that the engine requirement is economically infeasible and that technology is not available to meet the requirement, yet both of these arguments are defective. The claim that the measure is economically infeasible now is not persuasive, since the Port has not explained what changed between 2008 and today to make the measure infeasible, and has not provided any cost analysis. As Los Angeles has recognized, China Shipping could have presented evidence of economic infeasibility when the 2008 EIR/EIS was certified, but chose not to do so.[86]

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The Port's arguments about the feasible replacement schedule for yard tractors are not supported by substantial evidence either. In a March 25, 2015 letter, representatives for China Shipping indicated that replacements for the earliest purchased yard tractors would be due in three to five years, and that replacements for the 102 yard tractors purchased in 2007 and 2008 would come

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[83] Letter from Erich P. Wise, Flynn, Delich & Wise LLP, to Janna B. Sidley, Office of the City Attorney, City of Los Angeles (March 25, 2015) (Attachment A33 at POLA000995).
[84] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment, pp. III-17 to III-19, Table III-4 (Attachment E2); Port of Los Angeles, Zero Emission White Paper (July 2015), A1-3, Table A1-1 (Attachment C11).
[85] The Port has recognized that demonstration projects are the pathway to commercializing future technologies that have life-saving emissions reductions. Its own Zero Emission White Paper lionized the importance of demonstration projects for yard tractors in demonstrating successful technologies for drayage trucks, stating that they are a preferred type of technology for demonstrations due to the controlled environment within the port, providing a "simpler and more stable platform for demonstration," and stating that "increased expenditures focused on developing off-road zero emission yard tractors would help to ***accelerate*** the commercialization of on-road short haul drayage trucks." Port of Los Angeles, Zero Emission White Paper at 55; 23–25. The White Paper lists extensive reasoning why developing zero emission yard tractors should be a priority for the Harbor District, including that demonstration is easier within the terminal, off-road requirements are less stringent, the limited range within the terminal reduces EV range anxiety, the potential for a large electric yard tractor market worldwide would accelerate commercialization, that longer term payback may be more palatable to yard tractor tech developers than electric drayage truck developers, and that electric yard tractor development complements development of heavy-duty trucks. *Id*. at 23–25.
[86] Letter from Janna Sidley, Office of the City Attorney, City of Los Angeles to China Shipping (March 3, 2015) (Attachment A32).

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due in five to six years.[87] Under this logic, a feasible time frame for replacement tied to the useful life of the tractors could be due as early as March 2020, rather than the 2023 deadline suggested by the SDEIR.

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In addition, the Port must consider all feasible alternatives under CEQA. The SDEIR currently improperly narrows the feasibility analysis to LPG fueled yard tractors based on the technology that WBCT "prefers."[88] The SDEIR relies on estimates of the costs of LPG yard tractors and an LPG engine manufacturer's production rates when determining the feasible schedule of replacing the current tractors.[89] The Port fails to consider other types of proven technologies that could have emission reducing benefits beyond LPG engines, including electric yard tractors, hybrid electric engines, and Automated Guided Vehicles.[90] These other technologies may be more cost effective and commercially available. It is unacceptable that WBCT's "preference" should determine the scope of technologies considered under CEQA. The Port is required to consider all feasible technologies.

In particular, the Port's cursory dismissal of zero emission yard tractors does not satisfy CEQA, and is not supported by the evidence. Various terminals at both ports are using electric yard tractors in regular operations.[91] Long Beach Container Terminal (LBCT) at Middle Harbor is using electric yard tractors. Our understanding is that Trapac is also using electric yard tractors or equivalent equipment. As noted above, the Port should assess the electrified operations at both terminals and set forth similar measures here. Other examples of electric yard tractors in use include:

- At two terminals at the Port of Long Beach, CEC is funding a demonstration of 12 battery-electric yard tractors.[92]
- The Port of Los Angeles Everport terminal has a project underway to demonstrate eight zero emission yard tractors and 20 near-zero emission yard tractors.[93]
- The Port of Los Angeles Pasha terminal is demonstrating four zero emission electric yard tractors.[94]
- In March 2017, the first of 27 all-electric yard trucks started work at a freight yard in Southern California, funded by the State of California through a special emissions

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[87] Letter from Erich P. Wise, Flynn, Delich & Wise LLP to Janna B. Sidley, Office of the City Attorney, City of Los Angeles (March 25, 2015) (Attachment A33 at POLA000994).
[88] SDEIR at 2-15.
[89] Although AQ-15 is supposedly "technology neutral," the information provided about costs, the number of tractors that could be replaced in a given year, and the anticipated replacement schedule are calculated based on the assumption that new LPG tractors will be acquired. SDEIR at 2-15 to 2-16; B1-17, Table B1-C.
[90] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment, at III-5, Table 1; III-6 to III-7; III-29.
[91] Draft CAAP Update 2017 at 40.
[92] *Id.* at 43.
[93] *Id.*; CEC grant announcement (Attachment H3); Everport Terminal DEIR, presentation (Attachment C4).
[94] Draft CAAP Update 2017 at 42.

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reduction program that aims to expedite commercialization of zero emission heavy-duty trucks.[95]

- Manufacturers TransPower, OrangeEV, and Balqon have conducted or planned electric yard tractor demonstration projects at several different sites in the U.S.[96]

In addition, there are currently at least three Zero Emission Class 8 Electric Tractors available on the market:

- TransPower - Electric Class 8 Electric Yard Tractor
- BYD - Electric Class 8 Tractor - 8Y
- Terberg - Electric Class 8 Yard Tractor - Terberg YT202-EV[97]

Electric yard tractors are also cost effective, as their prices are expected to "drop significantly" as the technology matures, and their lifetime costs are reduced compared to traditional technologies because they save on engine maintenance, fuel costs, and employ a regenerative braking system that reduces brake wear.[98] For instance, Orange EV estimates that an owner of 10 electric yard trucks would save $6 million over 10 years in reduced fuel and maintenance costs.[99] The numerous deployments and manufacturers of zero emission yard tractors make it clear that requiring all electric yard tractors is feasible.

For the reasons stated above, the Port should strengthen MM AQ-15 to require replacing LPG yard tractors with electric yard tractors in the near-term.

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iii. The Forklift Measure (MM AQ-17) is Feasible, and Should Be Strengthened to Require Zero Emission Forklifts.

The 2008 EIR MM AQ-17 required that starting in January 2009, all forklifts purchased meet certain engine standards,[100] and that all forklifts meet Tier 4 off-road engine standards by the end of 2012. The Port does not clearly state whether these original mitigation requirements were

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[95] *See* CARB News Release: "First of 27 electric trucks coming to Southern California freight and rail yards," *available at* https://www.arb.ca.gov/newsrel/newsrelease.php?id=900 (Attachment H6).
[96] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-17 to III-19, Table III-4.
[97] *Id.*; *see also* Attachments J1–J2, J13, J20 and J23 (data from technology manufactures including BYD, Terberg, and Transpower).
[98] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20.
[99] *Id.* (citing Orange EV, Lower Total Cost of Ownership – Orange EV, May 2015, http://orangeev.com/lower-total-cost-of-ownership/).
[100] Starting January 2009, equipment purchases including forklifts shall be either 1) the cleanest available NOx alternative-fueled engines meeting 0.015 gm/hp-hr for PM or 2) the cleanest available NOx diesel-fueled engine meeting 0.015 gm/hp-hr for PM; and if no engines are available to meet that standard, the new engines shall be cleanest available and have cleanest VDEC. FEIR Mitigation List.

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complied with,[101] and admits that at most, only two of fifteen forklifts currently meet Tier 4 standards.[102] The terminal also fails to comply with CAAP measure SPBP-CHE1, which required all forklifts to meet Tier 4 off-road engine standards by 2012.[103]

The SDEIR provides no explanation for why the mitigation measure was not met. Instead, the Port proposes a revised measure that shifts back the deadline for 18-ton forklifts to meet Tier 4 off-road engine standards to 2021, and adds a requirement to replace 5-ton forklifts of model years 2011 or older with electric forklifts by 2020.[104] While we support the Port's effort to require replacement of 5-ton forklifts with electric forklifts, the Port must go further to satisfy CEQA's mandate to consider all feasible mitigation measures. **The Port should strengthen MM AQ-17 to require the terminal to transition to all zero emission forklifts by 2035, starting with transitioning the oldest lower capacity equipment (2005 and older) to zero emission in 2018.**

Both fuel cell electric forklifts and battery-electric forklifts are available. Lower capacity battery electric forklifts are commercially available and widely used in warehouse applications.[105] Battery electric forklifts are only 10-20 percent higher in capital cost than diesel for capacities of up to 6,000 pounds, and return on investment for a battery electric forklift can be as short as 1 to 3 years due to reduced fuel and maintenance costs.[106] Fuel cell forklifts are also widely used,

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[101] While Appendix D breaks down the compliance rates for the original mitigation measures, it does not provide a clear breakdown of compliance for each type of cargo handling equipment that is covered by measures AQ-16 and AQ-17. *See* SDEIR App. D at 21, Table 19. For example, Table 19 in Appendix D shows that the terminal failed to fully comply with MM AQ-17 every year between 2005 and 2013, with a 0% compliance rate from 2007–2010. From this table, however, it is unclear whether the terminal has complied with the forklift measure to any degree in any given year. In addition, both tables 18 and 19 fail to list whether equipment less than 750 hp met the requirement for Tier 4 engines by 2012. Both tables also are cut off at year 2013, and thus fail to show to what extent the terminal complied with 2014 cargo handling equipment measures which required Tier 4 engines. Finally, the meaning of Table 18 listing compliance with AQ-16 is unclear given that the SDEIR states elsewhere that there is no way to distinguish between railyard equipment and terminal equipment. *See, e.g.,* SDEIR at 2-16, 2-5 ("there is no actual distinction between railyard equipment and terminal equipment as a whole."). What pieces of equipment were included in the calculations to determine compliance with AQ-16?

[102] *Id.* at 2-17.

[103] CAAP Update 2010 at 28.

[104] The Port must include additional information clarifying how many and which forklifts will be upgraded. According to Table B1-C, there is a schedule to replace 12 forklifts, upgrading 5 diesel forklifts of up to 18 tons to Tier 4 diesel or alternative fuel meeting Tier 4 (between 2019 and 2021), and another 7 LPG forklifts with capacities up to 5 tons upgrading to electric (2020). But the SDEIR indicates that there are 15 forklifts associated with the China Shipping terminal, so 3 are not accounted for in the replacement schedule.

[105] *See, e.g.*, Attachment J6 (describing Kalmar's electric forklift).

[106] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20 to III-21 (also referencing (LiftsRUs, 2014) (EPRI, 2014)); CARB Mobile

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with about 8,000 hydrogen fuel cell electric forklifts operating at U.S. manufacturing facilities and warehouses, and 800 deployed in California.[107]

We were surprised to see that the project does not commit to an all zero emission hi-tonnage forklift requirement or even a demonstration project for that technology. The Port's bald claim that it is not feasible to electrify 12-ton and larger forklifts because forklifts above five tons are not available in all-electric models does not satisfy the CEQA requirement to consider all feasible mitigation measures.[108] Contradicting this statement, CARB has recognized that at least one manufacturer makes a forklift model with a lift capacity of 40,000 pounds, and lift capacities of up to 100,000 pounds are advertised.[109] And, the Pasha terminal at the Port of Los Angeles is demonstrating two hi-tonnage zero emission forklift retrofits.[110]

Replacing the hi-tonnage forklifts with new diesel equipment would invest the terminal in additional polluting equipment for the long-term, leave emissions reductions on the table, and hinder the terminal's ability to achieve 100% zero emission cargo handling equipment by 2030 as required by the CAAP, CARB regulations, and Mayors' Executive Directive.

For the reasons stated above, the Port should require all forklifts to be replaced with zero emission forklifts.

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iv. The Top-Pick Measure (MM AQ-17) is Feasible, and Should Be Strengthened to Require Zero Emission Top-Picks

The 2008 EIR MM AQ-17 required that by January 1, 2009, all toppicks shall have the cleanest available NOx alternative fueled engines meeting 0.015 gm/hp-hr for PM.[111] Today, none of the toppicks are alternative-fueled and only four meet the 0.015 gm/hp-hr PM standard.[112] The terminal also falls short of the CAAP, Measure SPBP-CHE1, Performance Standards for cargo handling equipment, which required toppicks to meet Tier 4 off-road engine standards by the end of 2012.[113]

Source Strategy, App. A at A-24 (Typically, maintenance costs 25 to 50 percent less, fuel is 20 to 40 percent of the cost of fueling an internal combustion forklift, and electric forklifts have a 50 percent longer useful life than internal combustion forklifts. These benefits can lead to payback time on the higher initial capital cost in as little as one year.).
[107] CARB Draft Heavy-Duty Technology and Fuels Assessment: Overview at 10. Manufacturers include Crown, Raymond, Hyster, Caterpillar, and others, and are in the early commercialization phase as of 2015. (Attachment E1)
[108] SDEIR at 3.1-46.
[109] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20.
[110] Draft CAAP Update 2017 at 42.
[111] SDEIR at 2-4.
[112] *Id.*
[113] CAAP Update 2010 at 128.

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The SDEIR proposes to abandon the alternative fuel requirement and push back the engine standard deadline, requiring replacement of toppicks with Tier 4 off-road engines by 2023.[114] Instead, **the Port should require replacement of top picks with battery electric top picks by 2030, with interim milestones to phase-in the technology.**

The Port does not overcome the presumption that the 2008 EIR MM AQ-17 for toppicks is feasible. The SDEIR does not include any reasoning as to why the top-pick mitigation was not implemented, nor does it explain why the mitigation measure was revised to delete the alternative fuel requirement, nor does it state a legitimate reason for extending the deadline for compliance with the engine standard. The Port is required to justify its revision of the mitigation measure for toppicks.

The Port's proposed schedule for replacing the top-picks is not the fastest feasible schedule. In a letter dated March 25, 2015, representatives for China Shipping wrote that the 8 top picks purchased in 2002 (which have Tier 1 engines) could be replaced in the following 18 months (by mid-2016), and that a reasonable timeframe to replace the other 30 was 3–5 years (2018 to 2020).[115] The Port fails to explain why the Tier 1 toppicks were not replaced in 2016, even though it appears that this would have been feasible. At minimum, the eight Tier 1 toppicks should be replaced with zero emission or Tier 4 complaint toppicks by 2018, and the twelve model year 2006 and 2007 toppicks should be replaced by 2020.

In revising the measure, the Port must consider the feasibility of requiring zero emission top picks to be demonstrated and implemented at the project site. Electric toppicks are currently being demonstrated at other terminals. The Pasha terminal at the Port of Los Angeles is testing a zero-emission top handler retrofit.[116] The Everport terminal is demonstrating two zero emission top handlers.[117]

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[114] There is little clarity about how many units would be replaced, or which units would be replaced. For instance, will the dirtiest units servicing the West Basin Container Terminal be replaced, or will those be deemed not to be servicing the China Shipping terminal? In Appendix B1, Table B1-C the replacement schedule for top picks anticipates replacement of 38 units, listing eight 2002 models, three 2006 models, eight 2007 models, fifteen 2008 models, three 2011 models, and one 2014 model. By contrast, the SDEIR anticipates replacement of only 23 units (SDEIR at 2-17), and even more confusingly, Table B1-31 lists six 2006 models and six 2007 models. The SDEIR also states that the four model year 2011 and 2014 toppicks meet the Tier 4 interim standard—yet these toppicks do not meet Tier 4 off-road standards, and therefore would not meet MM AQ-17 as revised. SDEIR at 2-17. Would those four toppicks also be replaced under MM AQ-17?
[115] Letter from Erich P. Wise, Flynn, Delich & Wise LLP to Janna B. Sidley, Office of the City Attorney, City of Los Angeles (March 25, 2015) (Attachment 33 at POLA000995).
[116] Draft CAAP Update 2017 at 42.
[117] *Id.* at 43.

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At a minimum, the Port should require the terminal to participate in a zero emission toppick demonstration project, or to require installation of electric toppicks contingent on the result of the demonstration at Pasha or Everport.

v. The Revised Measure for Sweepers and Shuttle Buses (MM AQ-17) Should Be Strengthened to Require Near-Term Replacement with Zero Emission Technologies

NRDC DSEIR-29

The SDEIR proposes revised measures for sweepers and shuttle buses, requiring gasoline shuttle buses to be zero emission units by 2025 and requiring sweepers to be alternative fuel or cleanest available by 2025. While we support the Port's efforts to transition to zero emission shuttle buses, **the Port should strengthen MM AQ-17 to require immediate replacement with electric shuttle buses and revise MM AQ-17 to require implementation of battery electric sweepers.**

Preliminarily, the SDEIR makes it impossible to evaluate whether the proposed revisions are legitimate. The SDEIR does not explain which of the original mitigation measures it is relaxing with respect to sweepers and shuttle buses, nor does it assess compliance rates. Without this assessment, it is impossible to know whether the revised measures delete or extend prior emission reduction requirements.

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Further, the SDEIR fails to provide any justifications for its proposed 2025 deadline to replace diesel powered sweepers and shuttle buses.[118] Overall, the lack of information about the measures for sweepers and shuttle buses begs the question of whether these measures will actually be implemented. For example, the SDEIR fails to include these pieces of equipment in its proposed mitigation replacement schedule for cargo handling equipment.[119] The SDEIR also lacks basic information about the number of sweepers and shuttle buses operating at the terminal, and fails to disclose the terminal's compliance history for those pieces of equipment.[120]

In any case, the Port's stunted analysis of these two measures fails CEQA because it does not assess the viability of zero emission technologies. The Port has the obligation to consider all feasible mitigation measures, and both electric sweepers and shuttle buses are commercially available. Zero emission buses are commercially available today, and are quickly dropping in price.[121] Over 100 vehicles have been deployed.[122] For example, Phoenix Motorcars

[118] SDEIR at 2-18.
[119] SDEIR App. B at B1-16, Table B1-C.
[120] The SDEIR offers contradictory accounts of how many sweepers are operating at the terminal, stating in one place that there is one sweeper at the West Basin Container Terminal, and in another place that there are two diesel-powered sweepers. SDEIR at 2-9, 2-16. Appendix B1, Table B1-31 listing the cargo handling equipment from the 2014 baseline includes one sweeper with model year 1995. The SDEIR does not list how many shuttle buses are currently operating at the terminal, nor does it provide any details about the types of shuttle buses employed.
[121] CARB Draft Heavy-Duty Technology and Fuels Assessment: Overview at ii, 8-9.
[122] *Id.* at 11.

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manufactures an electric zero emission shuttle bus that can drive up to 100 miles per charge and costs only $100,000 more than a similar diesel model.[123] In addition, battery electric powered sweepers "are mature technologies that are in use at distribution centers and manufacturing plants."[124]

For the reasons stated above, the Port should revise MM AQ-17 to require immediate replacement of shuttle buses with zero emission buses, and require battery-electric sweepers.

vi. Lease Measures AQ-1 and AQ-3 are not a substitute for considering all feasible mitigation measures

NRDC DSEIR-31

Lease Measures AQ-1 and AQ-3 do not satisfy the Port's duty under CEQA to consider all feasible mitigation measures in the SDEIR. Lease Measures AQ-1 and AQ-3 inspire no confidence that zero emission cargo handling equipment will be installed at the terminal. Lease Measure AQ-1 contains only vague language, and no assurance that emissions reducing technology will result from the measure. Given the Port's track record of failing to meet compliance dates and failing to hold terminal operators to technology requirements, we have no confidence that simply requiring conversations with the Port when tenants buy new technology will result in the purchase of a cleaner piece of equipment.

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Lease Measure AQ-3 is also too vague to be meaningful, pushes off introducing zero emission technology until far into the future, and allows tenants to avoid implementing zero emission technologies if their self-evaluations determine zero emission technology is infeasible. Lease Measure AQ-3 requires the tenant to conduct a one-year zero emission demonstration project with at least ten units of zero emission cargo handling equipment, and then assess the feasibility of using that equipment permanently. The Lease Measure does not specify what types of cargo handling equipment should be included, nor when the demonstration project is due. The tenant is not required to conduct a feasibility assessment evaluating zero emission technologies until 2020 and 2025, yet Lease Measure AQ-3 purports to support the goal of transitioning to zero and near-zero emission technologies by 2030. Without gathering this information and imposing interim deadlines in the near-term, we fail to see how it would be possible to transition to 100% zero emission cargo handling equipment by 2030. Finally, relying on the tenant's self-assessment of zero emission technology to determine feasibility cannot be counted on to lead to emission reductions, since it is in the tenant's best interest to avoid implementing zero emission technologies that can be costlier in the near term than sticking with status quo polluting equipment. It is the Port's obligation to impose and enforce mitigation measures, and Lease Measure AQ-3 provides the tenant too much discretion to decide what, when, and how zero emission equipment will be used.

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[123] *Id.* at 12.
[124] CARB, Draft Technology Assessment: Mobile Cargo Handling Equipment Technology Assessment at III-20.

F. The LNG Truck Measure (MMAQ-20) is Feasible, And Can be Strengthened to Require Zero Emissions Vehicles

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In 2008, after a thorough study that included pulling back and revising the initial DEIR, the Port concluded that phasing-in LNG trucks at the China Shipping terminal was feasible. In 2013, the Port concluded that a similar facility-specific phase-in of cleaner trucks was feasible at the near-dock Southern California Intermodal Gateway (SCIG) project.[125]

Nothing has changed about the Port drayage system from 2008 to the present. Nothing. Hundreds of LNG trucks now serve the Port. LNG trucks composed 8.2% of the Port's truck calls in 2014, with the percentage likely increasing in future years.[126] Class VIII LNG trucks are readily available in the market.[127]

Rather than try to fix the problem that it caused, the Port now wants to avoid the whole issue by saying, for the first time in any EIR, that a terminal-specific drayage plan is infeasible. This systemic infeasibility argument is a litigation artifact, manufactured after the Port got caught violating CEQA in order to excuse the Port's actions. In hundreds of pages of documents that predate the disclosure of the Port's failure to meet the 2008 mitigation measures, the Port never once asserted that any of the 2008 mitigation measures was infeasible—in fact, the Port strongly criticized China Shipping for failing to present data on infeasibility. Nor does the Port's new argument meet the CEQA definition of infeasibility. Moreover, the Port's do-nothing approach to diesel trucks violates Mayor Garcetti's recent zero emission policy directive and exacerbates the greenhouse gas problem that the Port admits that it has.[128]

Today, much more is feasible than was the case in 2008. Short-haul zero emission trucks with 100-mile range and 1–3 hour charge times are available now that can service the near-dock railyards and peel-off yards. Trucks with a 200-mile range and faster charging time or replaceable batteries are being developed and tested now. These trucks are huge improvements

[125] Los Angeles Harbor Department, Final Mitigation and Monitoring Program, SCIG Project EIR at 2-9 (March 2013) (MM AQ-8 requires phasing-in "low-emission drayage trucks" at the SCIG facility) (Attachment C9).
[126] SDEIR App. B at B-12.
[127] *See, e.g.,* "Natural Gas: What Fleets Need to Know, Part 2 – New Engines, More Options," *available at* http://www.truckinginfo.com/channel/fuel-smarts/article/story/2012/09/natural-gas-what-fleets-need-to-know-part-2-new-engines-more-options.aspx (Attachment J29); Cascadia Natural Gas: https://freightliner.com/trucks/cascadia-natural-gas/ (Attachment J30); https://cumminsengines.com/volvo; Kenworth: "Kenworth T680 and T880 Add Cummins Westport ISL G Near Zero Emissions Natural Gas Engine," *available at* http://www.kenworth.com/news/news-releases/2016/october/isl-g/; Peterbuilt: "Peterbuilt models 579, 567 Now Available with LNG Power," *available at* http://www.peterbilt.com/about/media/2015/459/ (Attachment J31); Mack: "Cummins Westport 1SX12 G Natural Gas," *available at* https://www.macktrucks.com/powertrain-and-suspensions/engines/cummins-natural-gas/.
[128] Joint Directive (Attachment D5); SDEIR at 3.2-21–3.2-41.

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over 2008 LNG trucks and diesel trucks, and will help with the Port's air pollution and greenhouse gas problems. The Port is required to analyze zero emission drayage in the SDEIR.

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1. The LNG Truck Measures (MMAQ-20) Is and Was Feasible

Mitigation measure MMAQ-20 in the 2008 EIR required a phase in of LNG trucks.[129] This did not happen. The Port knew contemporaneously that the phase-in was not happening because it had truck make information available to it through the port truck registry,[130] but did nothing to enforce the legally-binding mitigation measure except to nag China Shipping—which never agreed or expected to fund the LNG trucks.

In 2013, the Port approved a huge near-dock intermodal railyard project, SCIG. One of the approved mitigation measures called for a phase in of LNG-equivalent trucks to service the SCIG facility.[131] Although the SCIG matter is in litigation, the Port has never claimed in that litigation that this drayage measure is infeasible.

In fact, LNG trucks are in use now at the Port, as the Port's own data shows,[132] and others are readily available if it were a good idea to add them to the fleet now.[133] From a logistics standpoint, having one or two facilities served by LNG trucks is feasible as the Port recognized in 2008 and 2013 by the method of turning away non-LNG trucks at the gate.[134] Other measures to increase use of cleaner trucks could include expanding Pier Pass (encouraging trucks to work the Port in the evening), enacting a dirty truck rate and creating a preferential lane for clean trucks (as the Port contemplates in the draft Clean Air Action Plan), requiring cleaner trucks going to peel-off yards (also as contemplated in the draft Clean Air Action Plan), and providing other incentives through an appointment system such as are now in place at the TraPac facility and Middle Harbor in Long Beach.

Thus, nothing in the SDEIR overcomes the presumption that the previously certified LNG truck measure is feasible. *See Napa Citizens* at 359. The factual circumstances provided in the SDEIR for why the measure is not feasible today, SDEIR at 2-19–2-20, existed in 2008; nothing has changed. Either the Port was dishonest with the public in 2008 when it certified the measure, or it is being dishonest now. The fact that the current Port administration has changed its mind to

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[129] FEIR Mitigation Monitoring and Reporting Program.
[130] The Port of Los Angeles' drayage truck registry website is available at https://www.portoflosangeles.org/ctp/ctp_pdtr.asp.
[131] SCIG Final Mitigation and Monitoring Program at 2-9 (Attachment C9). The SCIG mitigation measure MM AQ-8 required phasing in "low-emission drayage trucks" at the SCIG facility. Such trucks were required to meet emissions standards that were comparable to LNG trucks at the time.
[132] *See* SDEIR App. B at B-12 (LNG trucks composed 8.2% of the Port's truck calls in 2014, with the percentage likely increasing in future years).
[133] *See supra* at note 127.
[134] *See* China Shipping FEIR, Responses to Comments at 2-188–2-189; SCIG FEIR, Responses to Comments Vol. 1 at 2-258–2-259 (Attachment C17).

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rationalize its failure to comply with binding mitigation measures has no bearing on the legal issues at play.

2. Zero Emission Drayage Trucks are Available Now for Short-haul and Must be Analyzed for Feasibility

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Zero emission drayage trucks are not a future science fiction fantasy. They are here now, particularly in short-haul applications that would be suitable for hauling containers from the Port to nearby off-dock railyards such as ICTF and SCIG (if SCIG is ever built). The South Coast Air Quality Management District (SCAQMD) recently described the status of zero emission drayage truck technology as follows:

> Heavy-duty diesel trucks in the South Coast Air Basin remain a significant source of emissions with adverse health impact, especially in the surrounding communities along the goods movement corridors near the Ports of Los Angeles and Long Beach (Ports), and next to major freeways. In order to mitigate the impact and attain stringent national ambient air quality standards for the region, SCAQMD has been aggressively promoting and supporting development and demonstration of advanced zero emission cargo transport technologies, in partnership with the Southern California Regional Zero Emission Truck Collaborative, comprised of the Los Angeles Metropolitan Transportation Authority, the Ports of Los Angeles and Long Beach, the Southern California Association of Governments, and the Gateway Cities Council of Governments.
>
> With two grants, totaling approximately $14 million from the DOE's Zero Emission Cargo Transport (ZECT) Program, the SCAQMD has engaged leading EV integrators, including BAE Systems, Transportation Power (TransPower) and US Hybrid, as well as a major truck manufacturer, Kenworth, to develop and demonstrate a variety of Class 8 electric drayage trucks, consisting of eleven zero emission trucks – six battery electric and five fuel cell trucks – and seven hybrid electric trucks with extended range using CNG, LNG or diesel ICEs. These trucks are deployed in real world drayage operations to evaluate the trucks' performance and capability as well as to identify limitations in supporting demanding drayage duty cycles. To date, five battery electric trucks (BETs) have been completed and deployed in field demonstration with drayage fleets at the Ports. With an estimated range of 80 to 100 miles per charge, these BETs are deployed in neardock and local operations within a 20-mile radius from the Ports and have been providing dependable service with positive feedback from fleet drivers on its quiet and smooth operations with sufficient power and torque. In addition, one CNG plug-in hybrid electric truck (PHET), with 30-40 miles in allelectric range (AER) and 150-200 miles of total operating range, is currently undergoing final validation testing before deployment and four more trucks, including two fuel cell trucks with 150-200 miles of range, are expected to be completed in Q1 2017.
>
> Leveraging the technologies and expertise gained from the ZECT program, SCAQMD proposed and received a $23.6 million grant from CARB under the Low

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Carbon Transportation Greenhouse Gas Reduction Fund (GGRF) Investment Program for a larger-scale demonstration of advanced electric drayage truck technologies in 2016. The project is to develop a portfolio of most commercially promising zero and near-zero emission drayage trucks for a statewide demonstration, across a variety of drayage applications in and around the Ports of Long Beach, Los Angeles, Oakland, Stockton and San Diego. SCAQMD has partnered with the four largest and most emission-impacted air districts in the state, namely Bay Area AQMD, Sacramento Metropolitan AQMD, San Joaquin Valley APCD and San Diego APCD, to build a comprehensive and coordinated approach to demonstrate the electric drayage trucks in diverse geographic and operational challenges across the state's interconnected goods movement system.

For the project, the SCAQMD has successfully engaged three major truck OEMs – Kenworth, Peterbilt and Volvo, and an international OEM leader in heavy-duty electrification, BYD, to drive commercially-viable product development stages in a targeted portfolio of zero emission and near-zero emission technologies and efficiency solutions, consisting of two battery-electric trucks, and two plugin hybrid electric trucks with extended range capability, using natural gas or diesel ICEs, as follows:

BYD will develop 25 battery electric trucks based on their T9 prototype, which is optimized to serve near-dock and short regional drayage routes with a range of up to 100 miles. The truck is designed to provide similar operating experience compared to equivalent diesel and CNG trucks with matching or exceeding power and torque, using two 180 kW in-line traction motors.

Kenworth will develop four plug-in hybrid electric trucks with natural gas range extender, leveraging the prototype development under the ZECT program. These vehicles will target longer regional drayage routes, based a well-balanced blend of all electric and CNG-based hybrid operation to provide 250 miles in total operating range with a capability to operate 30-40 miles in zero emission mode in disadvantaged communities near ports, rail yards and distribution centers. The powertrain system includes a 200 kW genset using the recently certified 8.9L near-zero CNG engine and two AC traction motors, with comparable power output to Class 8 diesel trucks.

Peterbilt has partnered with TransPower to develop 12 battery electric drayage trucks, building on a platform developed under the ZECT program, incorporating lessons learned from ongoing demonstrations to further refine and optimize the electric drive system. Eight of the twelve trucks will be designed to provide up to 80-100 miles in range to support near-dock drayage routes, and four extended-range battery electric trucks will incorporate a new, higher energy density battery cells to provide up to 120-150 miles of operation to service regional drayage routes, such as from the San Pedro Bay Ports terminals to Inland Empire warehouses.

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> Volvo will build on the success of a past SCAQMD/DOE-funded project by focusing on efficiency and emission optimization of a commercially attractive, highly-flexible product, while ensuring zero emission miles for operations in the most heavily emissions impacted communities. Furthermore, Volvo, in partnership with LA Metro, will also integrate ITS connectivity solutions, such as vehicle-to-infrastructure and vehicle-to-vehicle communications targeting dynamic speed harmonization and reduced idling, to reduce fuel use and emissions.
>
> This exceptional portfolio features demonstrations of truly commercial-pathway trucks. Highlighting the commercial path reality of this portfolio, the principal contractors are all major heavy-duty truck OEMs. This is significant because major OEMs can bring necessary engineering resources, manufacturing capability, and a distribution/service network to support the future commercialization of these demonstration vehicles. Our partnership also includes LA Metro's participation with ITS efficiency integration, electric utility participation, and 13 confirmed end-user fleets who are experienced with the specific challenges and opportunities associated with early technology integration efforts. The relationships and technologies in this project represent a culmination of years of experience: leading truck manufacturers, innovative large and medium suppliers, air quality management districts and industry groups all coordinated in a focused push to create OEM-quality, commercially-viable products that both reduce criteria and carbon emissions.

South Coast Air Quality Management District, Technology Advancement Office, *Clean Fuels Program 2016 Annual Report and 2017 Plan Update* (March, 2017) at 16–18.[135]

In addition, Tesla has announced the development of a Class 8 heavy-duty truck.[136] Toyota is developing a 200-mile Class 8 fuel cell truck which it has displayed at the Port.[137] The US Hybrid fuel cell truck referenced in the SCAQMD material is also designed for a 200-mile range.[138]

The SDEIR ignores this information. The SDEIR also ignores the June, 2017 Joint Executive Directive from Mayors Garcia and Garcetti (issued the same week the SDEIR was published)

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135 Attachment E16; *see also* South Coast Air Quality Management District, PowerPoint, Zero Emission Drayage Truck Demonstration: Low Carbon Transportation Greenhouse Gas Reduction Fund (Nov. 1, 2016) (discussing demonstration project of 43 zero emission drayage trucks from BYD, Peterbilt, Kenworth and Volvo). (Attachment E15).

136 Forbes: "Can Tesla Disrupt the Trucking Market with Its Electric Semi Truck?" *available at* https://www.forbes.com/sites/greatspeculations/2017/09/18/can-tesla-disrupt-the-trucking-market-with-its-electric-semi-truck/#7049953e626d (Attachment J14).

137 Wired: "Toyota's Still Serious About Hydrogen – It Built a Semi to Prove It," *available at* https://www.wired.com/2017/04/toyotas-still-serious-hydrogen-built-semi-prove/ (Attachment J19).

138 Trucks.com: "US Hybrid Jumps into Hydrogen Fuel Cell Truck Arena," *available at* https://www.trucks.com/2017/05/04/us-hybrid-hydrogen-fuel-cell-truck/ (Attachment J24).

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confirming Los Angeles and Long Beach's commitment to transition to a zero emission freight transportation system, which includes a commitment to an all zero emission drayage fleet by 2035.[139] Also ignored are similar proclamations from Governor Brown, the state legislature (SB 350),[140] and state and local air quality regulators that California must transition to a zero emission transportation system for passengers and freight to meet the state's air quality standards and greenhouse gas reduction goals.[141]

Importantly, recent evidence from CARB shows that battery electric drayage trucks have a lower life cycle cost than even diesel trucks, with costs further declining in 2023.[142] Thus, we believe that the Ports should require, as a feasible mitigation measure, the following minimum percentages of zero emission trucks at the terminal:

- 2020: 1.5% Zero Emission Trucks
- 2024: 25% Zero Emission Trucks
- 2028: 60% Zero Emission Trucks
- 2030: 90% Zero Emission Trucks
- 2035: 100% Zero Emission Trucks

This is a balanced commitment that will ramp up to 100% over the next seventeen years, ultimately meeting the goal directed by the Mayors of Los Angeles and Long Beach. It can be met at China Shipping and at all terminals in both ports.

NRDC DSEIR-36

Further, given that zero emission trucks for short-haul applications are feasible today, the Port should also consider how it can require short-haul drayage trips through the terminal to use such trucks. For example, the Port should consider requiring short-haul deliveries to and from near dock railyards or peel-off yards to be performed by zero emission trucks.

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139 Joint Directive (Attachment D5).

140 SB 350 directs agencies, including the Ports of Los Angeles and Long Beach, to prioritize widespread "transportation electrification" as a necessary step toward complying with state law and attaining ambient air quality standards. Pub. Util. Code § 740.12 (a)(1)(A), (a)(2) ("Advanced clean vehicles and fuels are needed to reduce petroleum use, to meet air quality standards, to improve public health, and to achieve greenhouse gas emissions reduction goals . . . It is the policy of the state and the intent of the Legislature to encourage transportation electrification as a means to achieve ambient air quality standards and the state's climate goals. Agencies designing and implementing regulations, guidelines, plans, and funding programs to reduce greenhouse gas emissions shall take the findings described in paragraph (1) into account.").

141 Office of Governor Edmund G. Brown Jr.: "Executive Order B-32-15," *available at* https://www.gov.ca.gov/news.php?id=19046 (Attachment D3); CARB Sustainable Freight: Pathways to Zero and Near-Zero Emissions (Discussion Draft) at 1, *available at* https://www.arb.ca.gov/gmp/sfti/Sustainable_Freight_Draft_4-3-2015.pdf (Attachment D9).

142 Attachment C16 at exhibit entitled "Advanced Clean Local Trucks (Aug. 30, 2017)."

NRDC DSEIR-36

It is not factually or legally permissible for the Port to throw up its hands and give up on China Shipping truck mitigation. The Port needs to get back to work and analyze feasible alternatives to the existing diesel fleet and show real movement to meeting Mayor Garcetti's directive.

3. SB1 Does Not Override the Port's Duty to Adopt All Feasible Mitigation for Truck Emissions

NRDC DSEIR-37

The Port relies on Senate Bill 1 (SB 1)[143] as a rationale for giving up on clean trucks at China Shipping. But the text of SB1 amended the portion of the Health and Safety code that pertains to *CARB's* authority to reduce vehicular pollution, and no other agency. And section 43021 (c) limits the reach of the statute to "laws or regulations." The cities and ports have always maintained that port truck bans are not regulatory in nature but stem from the port's proprietary interests. And there is no evidence whatsoever that SB1 overrides, restricts, or somehow preempts an agency's duty to comply with its CEQA obligation to adopt all feasible mitigation measures.

CARB also agrees that SB1 does not limit the Ports' authority. CARB released a Discussion Paper on September 6 clarifying that SB 1 does not prohibit the Ports from "establishing their own measures to accelerate the transition to a cleaner port truck fleet and to reduce emissions from trucks serving their facilities."[144]

4. The Feasibility Problem, if it Exists, Can be Solved With a Port-wide Solution as Contemplated in the Mayors' Executive Directive

NRDC DSEIR-38

The Mayors' joint proclamation puts both ports on a path to zero emission technology, including drayage trucks. If the Port believes that a trucking system involving only two facilities, China Shipping and SCIG, is not optimal, the Mayors' proclamation sets out a path for fixing that, Port-wide. But the SDEIR fails to analyze this.

G. The Priority Access for Cleaner Drayage Measure (LM AQ-2) Should be Limited to Zero Emission Trucks

NRDC DSEIR-39

The SDEIR sets forth the following lease measure: "A priority access system shall be implemented at the terminal to provide preferential access to zero- and near-zero emission trucks." Because of the emissions and greenhouse benefits of zero emission trucks, and the zero emission goals of the Port and City, we recommend that this measure be strengthened to only provide priority access for zero emission trucks.

H. The Port Should Keep and Amend the Throughput Tracking Measure (LM AQ-23)

The SDEIR proposes to delete the following lease measure in the FEIR:

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[143] Senate Bill 1 added section 43021 to the California Health and Safety Code.
[144] CARB, Discussion Paper: Implementation of March 2017 Board Direction on Reducing the Community Health Impacts from Freight Facilities (Sept. 6, 2017), *available at* https://www.arb.ca.gov/gmp/sfti/reducing_the_community_health_impact.pdf (Attachment E10).

NRDC DSEIR-40

> If the Project exceeds project throughput assumptions/projections anticipated through the years 2010, 2015, 2030, or 2045, staff shall evaluate the effects of this on the emissions sources (ship calls, locomotive activity, backland development, and truck calls) relative to the EIS/EIR. If it is determined that these emissions sources exceed EIS/EIR assumptions, staff would evaluate actual air emissions for comparison with the EIS/EIR and if the criteria pollutant emissions exceed those in the EIS/EIR the new or additional mitigations would be applied through MM AQ-22 Period Review or New Technology Regulations.

SDEIR at Table 2-1. The SDEIR contends that this measure is not necessary because the SDEIR "already takes into account the maximum capacity of the terminal and growth in TEU volume, and applies all feasible mitigation measures to address future air quality impacts." SDEIR at 2-21.

However, the SDEIR's throughput estimates are projections, and could be off (just as they were in the 2008 EIR). And technological advancements will certainly occur over the life of the project. The throughput tracking measure provides an important "check-in" to evaluate throughput, emissions, and updated technological advancements. That purpose is not served by the SDEIR.

NRDC DSEIR-41

Further, contrary to the SDEIR's suggestions otherwise, neither LM AQ-22 (Periodic Review of New Technology Regulations) nor LM AQ-1 (Cleanest Available Cargo Handling Equipment) are adequate substitutes for the throughput tracking measure. LM AQ-1 is limited to cargo handling equipment and so, no other sources will be cleaned up through that measure, SDEIR at 2-22. That lease measure also suffers from its own defects. *Supra* at 50. And while LM AQ-22 requires review and potential implementation of new technologies, those requirements occur less frequently than under the throughput tracking measure and appear subject to cost sharing by the Port. FEIR at 66 (requiring review and possible implementation of new technologies upon lease amendment, facility modification, or once every 7 years).

Given the Port's history of noncompliance with mitigation measures, and the fact that throughput projections have exceeded the projections in the 2008 EIR, this measure should be retained. It should, however, be amended to reflect annual evaluations, and be compared to emissions analysis contained in the SDEIR (subject to the recommended revisions noted in this letter) as opposed to the 2008 EIR/EIS.

IV. ADDITIONAL MITIGATION MEASURES ARE AVAILABLE TO REDUCE THE PROJECT'S SIGNIFICANT OPERATIONAL EMISSIONS

NRDC DSEIR-42

Even with its deficient air quality analysis, the SDEIR concludes that the Revised Project will result in significant air quality impacts, including significant ambient concentrations of PM10 (annual average) in 2030, 2036, and 2045; and significant cancer risk for residential, occupational, and sensitive receptors. SDEIR at 3.1-2. As noted above, had the SDEIR's air quality analysis been accurately performed, we believe that the project's significant air quality impacts would be larger in scope and severity.

NRDC DSEIR-42

In any event, the SDEIR's finding of significant impacts, triggers the duty to consider and adopt all feasible mitigation prior to project approval. Cal. Pub. Res. Code §§ 21002; 21061.1. Contrary to CEQA, the SDEIR narrowly revises mitigation for select source categories, and fails to set forth a broader range of strategies could reduce operational emissions. In addition, the SDEIR makes no attempt to consider any measures to offset the excess emissions experienced by the community due to the Port's failure to fully implement the measures in the 2008 EIR. Stated differently, while the SDEIR offers revised measures for the mitigation the Port did not adopt, this fact alone does not demonstrate CEQA compliance. The SDEIR must demonstrate that all feasible mitigation for the project's operational air quality impacts will be adopted. Cal. Pub. Res. Code §§ 21002; 21061.1.

To address these concerns, the SDEIR should analyze *all* feasible mitigation measures that will reduce operational emissions from the Project. This analysis is broader than the SDEIR's narrow re-evaluation of six specific mitigations from the 2008 EIR, and is required under CEQA.

NRDC DSEIR-43

A. Rerouting Cleaner Ships

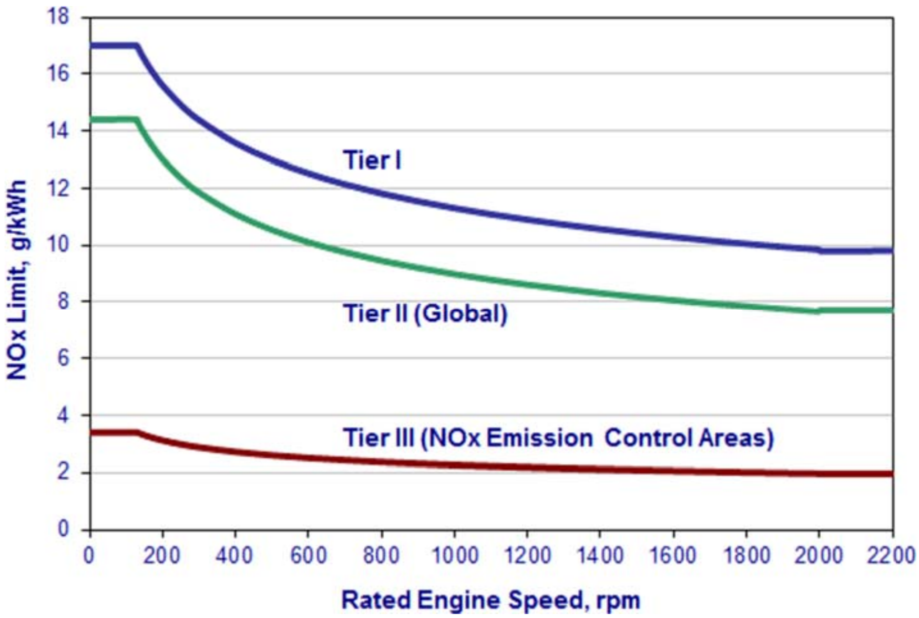
The 2008 EIR included a measure (MM AQ-13) that attracted newer, cleaner vessels to the project. MM AQ-13 stated "When scheduling vessels for service to the Port of Los Angeles, Tenant shall ensure that 75 percent of all ship calls to the Berth 97-109 Terminal meet IMO MARPOL Annex VI NOX emissions limits for Category 3 engines."[145] The SDEIR indicates that the Port is in full compliance with this measure,[146] which encouraged Tier 1 vessels to call at the terminal.

Since the adoption of MM AQ-13, the IMO has established cleaner engine standards for ships that reduce NOx emissions. Tier 2 engines, which were required to be installed on new ships beginning in 2011, are 15% cleaner than the previous generation of engines, and Tier 3 engines, which were available beginning in 2016, are 75% cleaner than Tier 2 vessels.[147] The following diagram depicts the emissions benefits of using Tier 2 and Tier 3 vessels over Tier 1.

[145] FEIR Mitigation and Monitoring Program.
[146] SDEIR at 2-3, Table 2-1 (limiting noncompliance to the 10 mitigation measures and one lease measure identified in Table 2-1).
[147] Draft CAAP Update 2017 at 50.

NRDC DSEIR-43

MARPOL Annex VI NOx emission limits[148]



The SDEIR should consider measures that would encourage the rerouting of Tier 2 and Tier 3 vessels to Berths 97-109 by requiring a certain percentage of such vessels to call at the terminal by a certain date, with increased percentages over time. The Port's ability to successfully implement its previous "rerouting cleaner ships" measure (MM AQ-13) indicates that such measures can and should be considered.

In 2015, 15% of vessel calls to San Pedro Bay were made by Tier 2 ships, and were mostly larger container vessels.[149] And in 2025, due to forecasted fleet turnover, the Port projects that 30% of total vessels calls will be by container vessels that meet Tier 2 standards.[150] The SDEIR should take such information into account to determine how to accelerate the pace of cleaner ships visiting the China Shipping terminal. The precise percentages and dates in which cleaner ships should be phased-in could be subject to a feasibility assessment in the SDEIR.

Further, while we understand that the Port does not project the first Tier 3 ship to visit the San Pedro Bay Ports until 2026,[151] the Project consists of a 40-year lease that will extend until 2045.[152] Accordingly, the Project's long life provides an opportunity for the Port to encourage Tier 2 *and* Tier 3 ships at the terminal before 2045.

Our recommendation that the SDEIR set forth measures that will require the rerouting cleaner ships to the China Shipping terminal as a method for reducing ship emissions is consistent with

148 International IMO Marine Engine Regulations, *available at* https://www.dieselnet.com/standards/inter/imo.php (Attachment G5).
149 Draft CAAP Update 2017 at 51.
150 *Id.* at 53.
151 *Id.* at 52.
152 SDEIR at 2-2.

NRDC DSEIR-43

the direction of the Draft CAAP Update 2017, and recent CARB recommendations.[153] As the Port is aware, ships are the largest source of maritime goods-movement-related NOx emissions, comprising 53% of the San Pedro Bay Ports total NOx emissions in 2015. Of those ship emissions, more than half are associated with ships transiting or maneuvering within approximately 100 nm of the ports.[154] As documented by the diagram above, encouraging cleaner vessels to visit Berths 97-109 would reduce operational emissions, and by significant amounts. For these reasons, the SDEIR should consider how it can encourage cleaner vessels to visit the project. Otherwise, it is leaving unmitigated operational emissions on the table in violation of CEQA.

B. Funding Mitigation Programs

NRDC DSEIR-44

The Port should also consider contributing grant funds to air pollution mitigation programs, including those that could be administered by the Harbor Community Benefit Foundation, and Technology Advancement Program. Such programs could fund, for example, additional air filtration systems and maintenance for existing systems, vegetation buffers for sensitive receptors, or zero emission technologies, and thus "avoid[]," "minimize[e]," "rectify[]," "reduc[e]," and/or "compensate[e]" for the community's long-term exposure to the project's operational emissions. CEQA Guidelines § 15370.

By way of example, to help reduce air quality impacts from the Port of Long Beach's Middle Harbor Project, that port required the project to fund the "Schools and Related Sites Guidelines for the Port of Long Beach Grant Programs and Healthcare and Seniors Facility Program Guidelines for the Port of Long Beach Grant Programs in the amount of $5 million each."[155]

C. Increasing Use of On-Dock Rail

NRDC DSEIR-45

The SDEIR states that "[t]he CS Terminal generates train trips to and from the on-dock rail yard (WBICTF) [West Basin Intermodal Container Transfer Facility]." SDEIR at 3.1-29. Moving goods via on-dock rail can reduce cargo movements by trucks and cargo handling equipment, mitigate associated emissions, and minimize traffic in neighboring communities. The Draft CAAP Update 2017 states that "[o]ver the long term, the Ports will seek to handle 50% of all cargo leaving the port complex by rail. Draft CAAP Update 2017 at 56. We support this goal.

The SDEIR however, indicates that the China Shipping terminal is nowhere near this goal. Table 2-3 indicates that the terminal is utilizing less on-dock rail than predicted in the 2008 EIR, and that the percentage of TEUs moved by on-dock rail are far less than the CAAP's 50% goal.

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[153] Draft CAAP Update 2017 at 51-54; CARB Comments on Everport DEIR at 4 (Attachment E6).
[154] Draft CAAP Update 2017 at 50.
[155] Port of Long Beach Middle Harbor Project FEIR at ES-33 (April 2009) (Attachment C12). Long Beach proposed something similar for its proposed (but not adopted) Pier S Project. Port of Long Beach Pier S Project FEIR at ES-35–36 (November 2012) (Attachment C15).

NRDC DSEIR-45

Below is a reproduction of Table 2-3 in the SDEIR, with the percentage of on-dock rail use highlighted in red.

Table 2-3: Comparison of Operation of the CS Container Terminal as Analyzed in the 2008 EIS/EIR and the SEIR.

Element	2008 Assumptions			SEIR Assumptions			
Year:	2015	2030	2045	2014 (Actual)	2023	2030	2036-2045
Throughput (TEUs)	1,164,00	1,551,000	1,551,000	1,089,000	1,521,228	1,698,504	1,698,504
Vessel Calls/yr	182	234	234	82	156	156	156
Truck Trips/yr	1,192,000	1,508,000	1,508,000	1,109,873	1,348,380	1,501,817	1,514,062
Train Trips/yr	648	816	816	570	703	723	738
%TEUs by Truck	81%	83%	83%	81%	85%	86%	86%
%TEUs by On-Dock	20%	17%	17%	19%	16%	14%	14%

Notes:
1) Analysis years differ because 2015 was an interim year for the 2008 EIS/EIR but 2014 is the baseline year for the SEIR.
2) %TEUs by Truck includes trips to near-dock/off-dock railyards.

The SDEIR should set forth—as a lease measure—that at least 50% of all cargo handled at the China Shipping terminal utilize on-dock rail. Given the terminal's access to on-dock rail facilities, the Port's larger on-dock rail goals, and CEQA's mandate that all feasible mitigation be considered and adopted for significant impacts, the SDEIR must consider on-dock rail as a mitigation measure.

NRDC DSEIR-46

D. Accelerating the Turn-Over of Harbor Craft

The SDEIR estimates that two tugboats will assist each arrival/departure of a container ship. SDEIR at 3.1-28. The SDEIR predicts 156 vessel calls per year in 2030. SDEIR at 2-12. This will generate 624 tugboat assists (4 tugboats x156 vessel calls). The SDEIR does not consider any measures for this emission source.

NRDC DSEIR

NRDC DSEIR-46

At a minimum, the SDEIR should analyze the measures that the Port is already analyzing in the Draft CAAP Update 2017 for harbor craft, and consider how such measures can be adopted at the China Shipping terminal.[156] The Draft CAAP states:

> To stimulate the identification, demonstration, and validation of technologies that can achieve emissions reductions from harbor craft beyond current state and federal regulation, the Ports will seek proposals for harbor craft technologies that have the potential to achieve NOx and DPM emission levels cleaner than Tier 4 standards, or technologies that can be retrofitted to existing harbor craft to achieve Tier 3 or Tier 4 emission levels through the following action:
>
> - Issue a Request for Proposals for harbor craft emission-reduction technologies by December 2017 with demonstrations to begin no later than mid-2018.
>
> . . . Additionally, the Ports propose the following strategies to reduce harbor craft emissions and fuel consumption:
>
> - Provide incentives for harbor craft operators to upgrade to the cleanest available (i.e. Tier 4) engines or low-emission hybrid systems in the short term, and to upgrade with advanced technologies (e.g. fuel cells and alternative fuels) in the long term. Incentives could be given through securing grants from federal, state or local agencies, a formal incentive program with financial rewards, or through more favorable lease terms, where applicable, for harbor craft operators that have cleaner fleets.
> - Identify operational changes that could reduce emissions, for example, by reducing the wait time or slow speed movements of assist tugboats while they are waiting to assist a vessel or by optimizing tugboat berth locations to minimize unnecessary travel.
> - As leases with harbor craft operators are opened or renegotiated, the Ports will assess whether it is possible to include requirements for harbor craft modernization, subject to the requisite negotiation process. Many harbor craft companies operate on private land and do not have leases with the Ports; however, the Ports will seek opportunities as they arise.

Accordingly, for example, the Port should consider issuing an RFP for harbor craft technologies that have the potential to achieve NOx and DPM emission levels cleaner than Tier 4 standards, and that can be dedicated to (or substantially serve) the China Shipping terminal. The SDEIR should also consider a measure that would offer incentives to harbor craft operators that serve the China Shipping terminal to upgrade to the cleanest available (i.e. Tier 4) engines or low-emission hybrid systems in the short term, and incentives to upgrade with advanced technologies (e.g. fuel cells and alternative fuels) in the long term.

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[156] Draft CAAP Update 2017 at 55.

E. Accelerating the Turn-Over of Locomotives

NRDC DSEIR-47

The SDEIR indicates that "[t]he CS Terminal generates train trips to and from the on-dock rail yard (WBICTF) as well as near- and off-dock rail yards." SDEIR at 3.1-29. Further, "[e]missions associated with hauling containers by rail include diesel exhaust from PHL locomotives performing switching activities at the on-dock rail yard, Class 1 switch locomotives performing switching activities at the near- and off-dock rail yards, and line-haul locomotive emissions used during transport within the SCAB and idling at the rail yards. SDEIR at 3.1-29–3.1-30.

The 2008 FEIR included MM AQ-18 to reduce locomotive emissions, which required, "[b]eginning January 1, 2015, all yard locomotives at Berth 121-131 Rail Yard that handle containers moving through the Berth 97-109 terminal shall be equipped with a diesel particulate filter (DPF)." Mitigation Monitoring and Reporting Program at 2-18. The FEIR committed to incorporating the measure into PHL's (Pacific Harbor Line) lease. *Id.*

Despite the SDEIR's recognition that locomotives contribute to the project's operational emissions, and Port's history in reducing such emissions from the project (the SDEIR does not take the position that MM AQ-18 is infeasible),[157] the SDEIR does not consider any new mitigation for locomotives.

The SDEIR indicates that "the active PHL switcher locomotive fleet in 2014 consisted of a combination of Tier 3-plus and genset locomotives, and were assumed to be converted to Tier 4 locomotives in future years on a 30 year or 15-year repower schedule, respectively." SDEIR at 3.1-30. The SDEIR should consider and set forth a mitigation measure that would accelerate the turnover of PHL's switcher locomotives that handle containers moving through Berths 97-100, so that conversion to Tier 4 locomotives happens sooner than 15 to 30 years from now. The Port's previous success in ensuring PHL's locomotives were equipped with DPFs demonstrates the Ports ability to work with other lease holders to secure emissions reductions from the project.

NRDC DSEIR-48

The SDEIR should also consider measures to reduce emissions from line-haul emissions. The SDEIR states that the San Pedro Bay Ports Clean Air Action Plan has a goal of ensuring all Class 1 locomotives entering the ports meet emissions equivalent to Tier 3 locomotives by 2023. SDEIR at 3.1-24. The SDEIR should discuss how the Revised Project is consistent with that goal, explain how the Port is working with the railroads to achieve those reductions, and consider ways to, for instance, incentivize or require the use of cleaner locomotive technologies through lease agreements as rail use increases at the China Shipping terminal.[158]

F. The SDEIR Should Consider "Smart" Logistic Systems

NRDC DSEIR-49

In addition to reducing tailpipe or smokestack emissions to reduce operational emissions, the project can also enhance operational efficiencies to reduce air pollution. The SDEIR should

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[157] *But see supra* 21 (raising concerns over whether the Port complied with MMAQ-18).
[158] *See* CARB, Technology Assessment: Freight Locomotives (Nov. 2016), *available at* https://www.arb.ca.gov/msprog/tech/techreport/final_rail_tech_assessment_11282016.pdf (containing information about cleaner locomotive technologies) (Attachment E11).

NRDC DSEIR-49

consider smart logistics systems, including but not limited to the Freight Advanced Traveler Information System (FRATIS), which is an intelligent transportation system that analyzes data from multiple sources to propose the most efficient routes, and schedules for drivers, dispatchers and cargo owners.

We understand that the Port is currently planning to conduct a demonstration project using FRATIS in late 2017. Draft CAAP Update 2017 at 61. The SDEIR should discuss the results of this demonstration project, and consider incorporating FRATIS or other measures to enhance operational efficiencies and reduce emissions. *See* EPA Comments on Everport DEIR (June 5, 2017) (Attachment E7). Relatedly, the SDEIR should evaluate the intelligent logistics systems employed at the Port of Long Beach Middle Harbor Project and at the Port's own Trapac terminal, and consider how such system can be used at the China Shipping terminal.

G. Additional Measures

NRDC DSEIR-50

In addition to the measures described above, the SDEIR should consider whether there are additional measures that can be adopted to reduce the Project's air quality impacts, including but not limited to measures that reduce emissions generated by refrigerated shipping containers, including methods for plugging such containers into power. The SDEIR should also consider if there are additional idling restrictions or enforcement measures that can be applied to reduce idling from trucks locomotives, and harbor craft. *See, e.g.,* Draft CAAP Update 2017 at 44–45. In short, the SDEIR must consider measures that can cut pollution from every emissions source operating at the terminal.

V. THE SDEIR MUST ENHANCE ITS MITIGATION MONITORING AND ENFORCEMENT PROGRAM

NRDC DSEIR-51

The management failures that led to the current China Shipping situation must never recur. Yet, the SDEIR appears to incorporate the same program that proved ineffective in monitoring and enforcing the 2008 mitigation measures.[159] To ensure that mitigations are actually implemented and monitored for compliance, we recommend the following:

1. A full public accounting of why the lease with China Shipping was never amended to include the 2008 measures, and why waivers were granted from AMP. A full understanding of what led to the current predicament is essential to ensuring any future mitigation and monitoring program does not repeat past mistakes.

NRDC DSEIR-52

2. Ongoing public disclosure of the status of all mitigation measures for all past and present Port CEQA projects. A third party—agreeable to the Port and the community—should be selected to oversee this monitoring reporting process. The reporting plan should include, at a minimum:

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159 *Compare* SDEIR at 3.1-66–3.1-68 *with* FEIR Mitigation, Monitoring and Reporting Program at 2-13–2-22. Both mitigation monitoring programs primarily consist of the Port including the mitigations in China Shipping's lease agreement.

NRDC DSEIR-52

- An assessment of mitigation compliance based on on-site visits, interviews, data from the drayage truck registry, and review of equipment and vehicle inventories.
- Throughput tracking to determine if actual throughput exceeds the projections in previously certified EIRs. In years when throughput exceeds projections, an assessment of excess emissions attributable to that throughput should be performed, as well as a plan to deal with those excess emissions.
- Ongoing assessment and implementation of cleaner technologies and practices that can be implemented at the terminals.

NRDC DSEIR-53

3. Creation of a permanent and independent oversight committee, funded to conduct audits of the implementation of all committed mitigation measures, port-wide. The committee could be modeled after the disbanded Port Community Advisory Committee (PCAC). The committee's work should be coordinated with the work of the third-party monitor.

VI. THE SDEIR'S ANALYSIS OF INCREASED GREENHOUSE GAS EMISSIONS IS LEGALLY INADEQUATE AND RELIES ON ILLUSORY MITIGATION MEASURES

NRDC DSEIR-54

Climate change is probably the most significant environmental problem that the United States faces. California has led the nation for years in its efforts to fight climate change, requiring deep cuts in greenhouse gas emissions by 2020 and later. Ignoring this, the SDEIR admits that the revised project will cause an *increase* in greenhouse gas emissions and relies on illusory mitigation measures that, even by the Port's calculation, will not return greenhouse gas emissions to baseline, much less decrease them. This is unconscionable and invalid as a matter of law.

The SDEIR admits that: "Revised Project incremental GHG emissions are 34,591 metric tons of CO2e in the peak year of operations in 2030. They exceed the 10,000 metric 24 ton CO2e significance threshold by 24,591 metric tons."[160] In addition: "The Revised Project would generate GHG emissions, either directly or indirectly, that would exceed the 42 SCAQMD 10,000 mty CO2e threshold in 2023, 2030, 2036 and 2045."[161]

Under California AB 32, enacted in 2006, statewide greenhouse gas emissions must be reduced to 1990 levels by 2020, roughly a 15% reduction from a business as usual scenario.[162] In 2016, the Governor signed SB 32 which requires a reduction in greenhouse gases of 40 percent below 1990 levels by 2030.[163] Increasing greenhouse gases emissions violates both statutes. Even the

[160] SDEIR at 3.2-2.
[161] *Id.*
[162] CARB, Assembly Bill 32 Overview, *available at* https://www.arb.ca.gov/cc/ab32/ab32.htm (last visited Sept. 26, 2017) (Attachment D6).
[163] CARB, AB 32 Scoping Plan, *available at* https://www.arb.ca.gov/cc/scopingplan/scopingplan.htm (last visited Sept. 26, 2017) (Attachment D7).

NRDC DSEIR-54

SDEIR admits that, "for informational purposes," that the Revised Project "would not be consistent with some state and local plans, and policies adopted for the purpose of reducing GHG emissions and climate change impacts." SDEIR at 3.2-2–3.2-3; *see also id.* at 3.2-30–3.2-39.

NRDC DSEIR-55

Moreover, the greenhouse gas analysis in the SDEIR likely underreports past greenhouse gas emissions because it relies on mitigation measures such as AMP and LNG trucks that were not complied with. For example, using AMP at dock reduces fossil fuel combustion in comparison to the fossil fuel burned to generate electricity, but that difference is not captured in a retrospective analysis that (wrongly) assumes full compliance with the AMP requirement. Similarly, LNG trucks typically do not emit greenhouse gases at the same rate that diesel trucks do[164] and that difference is also lost because LNG trucks were not brought into the fleet as required by the 2008 EIR.

NRDC DSEIR-56

Even worse, the proposed mitigation measures in the SDEIR do not come close to meeting the AB 32 or SB 32 requirements. By the Port's calculations, most greenhouse gases in the future will come from off-site trucks, with the next largest portion coming from cargo handling equipment. SDEIR at Table 3.2-1, page 3.2-18, Table 3.2-2, page 3.2-19. Yet the DEIR proposes *no* mitigation for drayage and fails to set forth all feasible measures that would phase in zero emissions cargo handling equipment, *supra* at 30-42. Although LED lighting is good (MM GHG-1), it won't touch the greenhouse gas emissions of port trucking, much less cargo handling equipment and rail.

The only other mitigation measure proposed is establishment of a greenhouse gas mitigation fund (LM GHG-1) paid for by the tenant, China Shipping, even though China Shipping has refused to sign an amended lease incorporating the 2008 EIR mitigations, and has balked at funding any mitigation measures.[165] This brings "illusory" to a new level.

NRDC DSEIR-57

There are real mitigation measures available to the Port such as zero emission trucks and cargo handling equipment, and increased use of AMP, as we have detailed in our comments above, and that are in the draft Clean Air Action Plan. *See, e.g.,* Draft CAAP Update 2017 at 30–34, 39–45, 46–47. Those measures need to be considered in the SDEIR. In addition, the required energy efficiency analysis under CEQA Guidelines Appendix F (as discussed below) would yield additional mitigation measures that must be considered.

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[164] Great care needs to be taken in such an analysis because of the problem of methane leakage in the production of LNG. Methane is an extremely potent greenhouse gas, much more so than CO2. The SDEIR should have, but did not, conduct this analysis.

[165] In fact, China Shipping sued the Port for damages relating to implementation of the ASJ and the Port paid a multi-million dollar settlement. (Attachment A68 at POLA001715).

VII. THE SDEIR FAILS TO COMPLY WITH CEQA GUIDELINES APPENDIX F

NRDC DSEIR-58

The SDEIR contains no analysis of the energy conservation factors required to be included under CEQA Guidelines Appendix F,[166] which provides in part:

> In order to assure that energy implications are considered in project decisions, the California Environmental Quality Act requires that EIRs include a discussion of the potential energy impacts of proposed projects, with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy.

This is important here because additional energy efficiency measures would help mitigate the dismal greenhouse gas emissions situation shown in the SDEIR. Failure to analyze the Appendix F factors can, by itself, invalidate an EIR. *See, e.g., Cal. Clean Energy Comm. v. City of Woodland*, 225 Cal.App.4th 173 (Cal.Ct.App. 2014).

For example, zero emission trucks and cargo handling equipment will, by definition, eliminate most fossil fuel use at the Port and so save energy compared to the lifecycle energy of electricity generation by the L.A. Department of Water and Power with increasing percentages of renewable energy. It may be that LNG trucks save energy compared to diesel, but the SDEIR does not analyze this. The AMP requirement may also save energy in comparison to ships burning marine fuel while at dock—but this is not analyzed either.

Appendix F provides specific guidance on how to analyze these issues that the Port should consider. For example, energy impacts could include:

> 1. The project's energy requirements and its energy use efficiencies by amount and fuel type for each stage of the project's life cycle including construction, operation, maintenance and/or removal. If appropriate, the energy intensiveness of materials may be discussed.
>
> 2. The effects of the project on local and regional energy supplies and on requirements for additional capacity.
>
> 3. The effects of the project on peak and base period demands for electricity and other forms of energy.
>
> 4. The degree to which the project complies with existing energy standards.
>
> 5. The effects of the project on energy resources.
>
> 6. The project's projected transportation energy use requirements and its overall use of efficient transportation alternatives.

[166] CEQA Guidelines, App. F, *available at*http://resources.ca.gov/ceqa/guidelines/Appendix_F.html.

NRDC DSEIR-58

Feasible mitigation measures, for example, for the Port's greenhouse gas impacts, may include:

1. Potential measures to reduce wasteful, inefficient and unnecessary consumption of energy during construction, operation, maintenance and/or removal. The discussion should explain why certain measures were incorporated in the project and why other measures were dismissed.

2. The potential siting, orientation, and design to minimize energy consumption, including transportation energy.

3. The potential for reducing peak energy demand.

4. Alternate fuels (particularly renewable ones) or energy systems.

5. Energy conservation which could result from recycling efforts

Critically, in view of the SDEIR's preference of diesel trucks over LNG or zero emission, Appendix F requires that: "Alternatives should be compared in terms of overall energy consumption and in terms of reducing wasteful, inefficient and unnecessary consumption of energy." Similarly, the SDEIR must compare its ongoing reliance on diesel and LPG cargo handling equipment in lieu of phasing in, for example, electric yard hostlers, RTGs, and forklifts. These analyses, which should also consider the greenhouse gas impacts of the project, was not done here, and must be.

THE DISCRETIONARY DECISION BEFORE THE BOARD OF HARBOR COMMISSIONERS

For the reasons stated above, the SDEIR must be revised and recirculated.[167] Once the CEQA document discloses the project's significant effects (including retrospective and prospective impacts), the Board of Harbor Commissioners must adopt all feasible mitigation. This could include enforcing some or all the 2008 EIR's measures, and/or revising the project to add new feasible measures. We have provided a number of technologies the Port should consider, and that are aligned with the City and Port's zero emission goals.

NRDC DSEIR-59

Further, the record shows that China Shipping has no interest in complying with the mitigation measures in the 2008 EIR. And that it has no interest in devising alternate measures or even explaining its noncompliance. Consequently, there is no reason to believe that China Shipping will comply with any revised measures identified in the SDEIR. Additionally, our understanding is that China Shipping, having merged with COSCO, is moving its business to the Port of Long

[167] The Port chose to prepare a *supplement* EIR, which is normally prepared when only minor revisions are needed to make the previous EIR adequate. CEQA Guidelines §15163(a)(2). Given the errors in the SDEIR outlined above, and the Port's recognition that the 2008 EIR is outdated and unreliable, major revisions to the previous EIR are needed to ensure that the project's impacts have been fully disclosed and mitigated in compliance with CEQA. Accordingly, the Board should consider whether a revised, subsequent, or some other form of EIR is required under these circumstances.

NRDC DSEIR-59

NRDC DSEIR-60

NRDC DSEIR-61

Beach. The opportunity exists to negotiate a termination of the Port's lease with China Shipping—or force a termination based on noncompliance—and lease the site to an entity that is committed to zero emission technology and additional on-dock rail.

Thus, faced with the errors in the SDEIR, and the current operations at the terminal, we recommend that the Board:

1. Revise the SDEIR to ensure the project's impacts are assessed and mitigated; and

2. Terminate the lease with China Shipping and find a tenant that can comply with CEQA, and partner with the City in fulfilling its zero emission goals.

Absent these steps, we cannot reconcile how the Port will comply with CEQA or meet its project objectives to grow the terminal sustainably.

Sincerely,

Melissa Lin Perrella,
Natural Resources Defense Council

David Pettit
Natural Resources Defense Council

Taylor Thomas,
East Yard Communities for Environmental Justice

Kathleen Woodfield
Dr. John G. Miller, MD,
San Pedro and Peninsula Homeowners Coalition

Joe Lyou
Nidia Erceg,
Coalition for Clean Air

Sylvia Betancourt,
Long Beach Alliance for Children with Asthma

Chuck Hart
San Pedro Peninsula Homeowners United

Angelo Logan
Urban and Environmental Policy Institute, Occidental College

Enclosures:

- Index of documents supporting NRDC's comments on the SDEIR
- Flash drive containing all documents cited in the index

cc: Los Angeles Mayor Eric Garcetti
City of Los Angeles Chief Sustainability Officer Lauren Faber O'Conner
Los Angeles Councilmember Joe Buscaino
Lieutenant Governor and State Lands Commissioner Gavin Newsom
State Controller and State Lands Commissioner Betty T. Yee
Finance Director and State Lands Commissioner Michael Cohen
Deputy Controller for Environmental Policy Anne Baker
Members, Port of Los Angeles Board of Harbor Commissioners
Eugene Seroka, Executive Director, Port of Los Angeles
Wayne Nastri, Executive Officer, South Coast Air Quality Management District

Index of Attachments in Support of NRDC, et al.'s Comments on the SDEIR for the China Shipping Project (9/29/17)

A - Public Records Act Documents

B - China Shipping Litigation and Related Documents

C - San Pedro Bay Port Studies and Assessments

D - City and State Documents

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F - Academic and Other Independent Studies

G - Rules, Regulations, and Resolutions

H - Miscellaneous Press Statements and News Articles

I - Sonoma Technology, Inc Report and References

J - Press Statements and Data from Technology Manufacturers

From:	Manzo, Mariela
To:	Ceqacomments; Cannon, Chris
Cc:	"mayor.garcetti@lacity.org"; lauren.faber@lacity.org; councilmember.buscaino@lacity.org; gavin.newsom@lgt.ca.gov; abaker@sco.ca.gov; Commissioners; Seroka, Gene; wnastri@aqmd.gov; LinPerrella, Melissa; Pettit, David; Wyenn, Morgan
Subject:	NRDC Comment Letter re: Draft Supplemental Environmental Impact Report – Berths 97-109 [China Shipping]
Date:	Friday, September 29, 2017 2:01:18 PM
Attachments:	China Shipping SDEIR comment letter FINAL with Index.pdf

Dear Mr. Cannon,

On behalf of the Natural Resources Defense Council, San Pedro and Peninsula Homeowners' Coalition, San Pedro Peninsula Homeowners United, Coalition for Clean Air, East Yard Communities for Environmental Justice, Long Beach Alliance for Children with Asthma, Urban & Environmental Policy Institute, Occidental College attached please find:

(1) Written comments on the Draft Supplemental EIR for Berths 97-109, China Shipping Container Terminal (SDEIR); and
(2) A drop box link containing documents supporting our written comments:
https://www.dropbox.com/sh/mzqilzk1q8lfwmm/AAAqi8o3xjx-QSbp2Wcj63T5a?dl=0

We are also hand-delivering a hard copy version of our written comments along with a flash drive containing the same documents within the drop box link. Please note that the drop box link should be "live" for the foreseeable future but may become unusable on some future date. Thus, we would recommend relying on the flash drive to retrieve our documents.

Regards,

MARIELA MANZO
Program Assistant

NATURAL RESOURCES
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Response to Comment NRDC DSEIR-1

This comment refers to material presented in the previous Draft SEIR for the Revised Project (the DSEIR). The entire DSEIR has been revised and recirculated as the Recirculated DSEIR, and LAHD has required that reviewers submit new comments on the Recirculated DSEIR. Accordingly, comments on the DSEIR remain part of the administrative record but need not be included or responded to in the Final SEIR (CEQA Guidelines section 15088.5(f)(1). Subsequent comments presenting specific concerns are responded to below.

Response to Comment NRDC DSEIR-2

The LAHD disagrees that 2000-2001 is the appropriate baseline. Please see Responses to Comments NRDC-6 and NRDC-7. Please note also that the Recirculated DSEIR's baseline was changed to 2008. With respect to non-compliance in previous years, please see Master Response 4: Non-Compliance with the Original FEIR Mitigation Measures.

The commenter is incorrect in asserting that the original China Shipping Container Terminal Project approved in 2008 and the proposed Revised Project together constitute "the whole of the action" whose impacts are required to be evaluated in this SEIR. As explained in Response to Comment NRDC-6, under CEQA the purpose of a supplemental EIR is limited to determining whether proposed changes to a previously reviewed project result in environmental impacts that were not already and previously analyzed in a prior EIR. (Public Resources Code § 21166.) As further explained in Response to Comment NRDC-7, *POET II* does not concern supplemental environmental review under CEQA, and does not change the limitations placed by CEQA on the scope of supplemental environmental review.

Comments regarding the content of Appendix D refer to material presented in the 2017 DSEIR, which is not replicated in the Recirculated DSEIR. Accordingly, comments on Appendix D do not require a written response. With respect to MM AQ-20 (LNG trucks), please see Response to Comment NRDC-35.

Response to Comment NRDC DSEIR-3

The first two paragraphs of this comment refer to material presented in a previous draft (the 2017 DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, that portion of the comment does not require a written response.

The human health-related effects of emissions associated with the Revised Project are disclosed and evaluated in full compliance with CEQA in Section 3.1 of the Recirculated DSEIR, which has been augmented with additional disclosures in Section 3.1 of the Final SEIR.

Response to Comment NRDC DSEIR-4

Please see Response to Comment NRDC-7 for a discussion of the requirements of the relationship of the *POET II* case to the Revised Project and its CEQA documentation.

Response to Comment NRDC DSEIR-5

Regarding Appendix D, this comment refers to material presented in a previous draft (the 2017 DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Regarding the comments on EMFAC2014 model, LAHD considers CARB's models to be the most appropriate tool to estimate on-road and off-road emissions for California sources. The commenter does not provide alternative equivalent models that improve on EMFAC methodology. Please note that EMFAC2014 emissions have been replaced in the Recirculated DSEIR with those in the latest version (EMFAC2017).

Response to Comment NRDC DSEIR-6

Please see Response to Comment NRDC-15.

Response to Comment NRDC DSEIR-7

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Response to Comment NRDC DSEIR-8

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Response to Comment NRDC DSEIR-9

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Response to Comment NRDC DSEIR-10

Please see Response to Comment SCAQMD-28.

Response to Comment NRDC DSEIR-11

The Draft SEIR's wording was unclear on the status of PHL's switcher locomotives that service the CS Terminal. In fact, PHL operates both Tier 3+ units equipped with DPFs and Genset switchers with off-road engines that meet or exceed the emissions factors of DPFs. Accordingly, the LAHD determined that MM AQ-18 had been complied with and did not need to be included in the Revised Project.

Response to Comment NRDC DSEIR-12

The DSEIR was prepared using the level of technical detail appropriate to the complex, highly technical issues being analyzed, and follows LAHD's CEQA protocol, as was the Recirculated DSEIR which supersedes the DSEIR. Comments regarding the content of Appendix D refer to material presented in the DSEIR which is not replicated in the Recirculated DSEIR. Accordingly, comments on Appendix D do not require a written response.

Response to Comment NRDC DSEIR-13

Please see Response to Comment NRDC-20.

Response to Comment NRDC DSEIR-14

Please see Response to Comment NRDC-21.

Response to Comment NRDC DSEIR-15

Please see Response to Comment NRDC-22.

Response to Comment NRDC DSEIR-16

Please see Response to Comment NRDC-23.

Response to Comment NRDC DSEIR-17

Please see Response to Comment NRDC-23.

Response to Comment NRDC DSEIR-18

Please see Response to Comment NRDC-23.

Response to Comment NRDC DSEIR-19

Please see Response to Comment NRDC-24.

Response to Comment NRDC DSEIR-20

Please see Response to Comment NRDC-25.

Response to Comment NRDC DSEIR-21

Please See Responses to Comments NRDC-26 and NRDC-27.

Response to Comment NRDC DSEIR-22

Please see Response to Comment NRDC-28.

Response to Comment NRDC DSEIR-23

Please see Response to Comment NRDC-29.

Response to Comment NRDC DSEIR-24

Please see Response to Comment NRDC-29.

Response to Comment NRDC DSEIR-25

Please see Response to Comment NRDC-29.

Response to Comment NRDC DSEIR-26

Please see Response to Comment NRDC-29.

Response to Comment NRDC DSEIR-27

Please see Response to Comment NRDC-30.

Response to Comment NRDC DSEIR-28

Please see Response to Comment NRDC-31.

Response to Comment NRDC DSEIR-29

Please see Response to Comment NRDC-32.

Response to Comment NRDC DSEIR-30

Please see Response to Comment NRDC-32.

Response to Comment NRDC DSEIR -31

Please see Response to Comment NRDC-33.

Response to Comment NRDC DSEIR-32

Please see Response to Comment NRDC-33.

Response to Comment NRDC DSEIR-33

Please see Response to Comment NRDC-34.

Response to Comment NRDC DSEIR-34

Please see Response to Comment NRDC-35.

Response to Comment NRDC DSEIR-35

Please see Response to Comment NRDC-36.

Response to Comment NRDC DSEIR-36

Please see Response to Comment NRDC-36.

Response to Comment NRDC DSEIR-37

This comment incorrectly asserts that the LAHD relies on SB 1 (codified as California Health and Safety Code section 43021) as a "rationale for giving up on clean trucks at China Shipping." The Recirculated DSEIR explains its reasons for not including 2008 MM AQ-20 in the Revised Project in section 2.5.2, "Revised Project Elements." That discussion explains that the basis for eliminating MM AQ-20 lies in three basic types of constraints – industry, truck technology, and financial constraints – and does not rely on, or even mention, SB 1 or H&S Code section 43201 as a basis for not including 2008 MM AQ-20 in the Revised Project. Rather, Section 3.1 of Recirculated DSEIR discusses SB-1 as one of the "State Regulations and Agreements" that together form the regulatory background for analysis of the air quality impacts of the Revised Project.

The discussion in section 3.1 notes that SB-1 is a recently enacted law, that "the full effect of Section 43201 is not known at the time of this Draft SEIR," that the new law "may complicate the ability of LAHD to require retirement, replacement, or retrofitting of drayage trucks in advance of CARB regulations adopted in accordance with SB-1," and that LAHD has been in discussions with CARB about the law and will continue to work cooperatively with CARB in pursuit of shared goals. Because the legal questions about SB-1 discussed in Recirculated DSEIR section 3.1 do not play any role in the LAHD's determination that 2008 MM AQ-20 is infeasible and cannot be included in the Revised Project, CEQA does not require that those legal questions be resolved in this SEIR.

Response to Comment NRDC DSEIR-38

Please see Response to Comment NRDC-37.

Response to Comment NRDC DSEIR-39

Please see Response to Comment NRDC-38.

Response to Comment NRDC DSEIR-40

Please see Response to Comment NRDC-39.

Response to Comment NRDC DSEIR-41

Please see Response to Comment NRDC-39. The LAHD disagrees with the comment's characterization of LM AQ-22 as requiring technology review at a lower frequency than LM AQ-23 would have required under the throughput tracking requirement. LM AQ-23 was keyed to the future horizon years of 2010, 2015, 2030, and 2045, meaning that as much as 15 years could pass between throughput checks required by the measure. LM AQ-22, by contrast, required the tenant to "implement not less frequently than once every 7 years following the effective date of the permit, new air quality technological advancements…" and "to review…new emissions technology… at the time of the Port's consideration of any lease amendment or facility modification for the Berth 97-109 property." Accordingly, technology reviews would certainly happen no less frequently, and likely more frequently, under LM AQ-22 than under LM AQ-23. LM AQ-1 supplements LM AQ-22 by ensuring a more frequent review cycle (annually) for a class of sources for which technology can be expected to develop more quickly than for vessels, i.e., cargo-handling equipment. The LAHD concludes that together these two measures are an adequate replacement for LM AQ-23.

Response to Comment NRDC DSEIR-42

Please see Response to Comment NRDC-40.

Response to Comment NRDC DSEIR-43

Please see Response to Comment NRDC-41.

Response to Comment NRDC DSEIR-44

Please see Response to Comment NRDC-42.

Response to Comment NRDC DSEIR-45

Please see Response to Comment NRDC-43.

Response to Comment NRDC DSEIR-46

Please see Response to Comment NRDC-44.

Response to Comment NRDC DSEIR-47

Please see Response to Comment NRDC-45.

Response to Comment NRDC DSEIR -48

Please see Response to Comment NRDC-45.

Response to Comment NRDC DSEIR-49

Please see Response to Comment NRDC-46.

Response to Comment NRDC DSEIR-50

Please see Response to Comment NRDC-47.

Response to Comment NRDC DSEIR-51

Please see Response to Comment NRDC-48.

Response to Comment NRDC DSEIR-52

Please see Response to Comment NRDC-48.

Response to Comment NRDC DSEIR-53

Please see Response to Comment NRDC-48.

Response to Comment NRDC DSEIR-54

The Recirculated DSEIR contains a revised GHG analysis such that the figures cited in the comment are no longer relevant, but the Recirculated DSEIR concludes, for informational purposes, that the Revised Project would likely not be consistent with some plans and programs related to greenhouse gas emissions. Greenhouse gas emissions from rail activity associated with the Revised Project are analyzed in compliance with CEQA in section 3.2 of the Recirculated DSEIR. Those emissions do not violate AB 32 or SB 32, which concern regulation of greenhouse gases at the statewide level, and do not apply directly to the Revised Project.

Response to Comment NRDC DSEIR-55

See Response to Comment NRDC DSEIR-54. The GHG analysis has been revised in the Recirculated DSEIR.

Response to Comment NRDC DSEIR-56

Please see Responses to Comments NRDC-27 through NRDC-32, NRDC-34 through NRDC-37, and NRDC DSEIR-54, and Master Response 2: Zero- and Near-Zero-Emission Technologies.

Response to Comment NRDC DSEIR-57

Please see Responses to Comments NRDC-27 through NRDC-32, NRDC-34 through NRDC-37, and NRDC-49, Master Comment 2: Zero Emission Technologies, and Master Comment 3: Port-Wide Emission Reduction Programs.

Response to Comment NRDC DSEIR-58

Please see Response to Comment NRDC-50.

Response to Comment NRDC DSEIR-59

Please see Response to Comment NRDC-51.

Response to Comment NRDC DSEIR-60

Please see Response to Comment NRDC-51.

Response to Comment NRDC DSEIR-61

Please see Response to Comment NRDC-52.

2.3.2.10 NRDC Attachment I1 to 2017 Letter

Sonoma Technology, Inc.
Innovative Environmental Solutions

Technical Memorandum
Attorney-Client Work Product

September 26, 2017 STI-917041

To: Melissa LinPerrella and David Pettit, Natural Resources Defense Council

From: Lyle R. Chinkin, Chief Scientist and President Emeritus

Re: Technical Review of Draft Supplemental Environmental Impact Report (DSEIR), China Shipping Container Terminal Project (dated June 2017)

Summary of Findings and Recommendations

In the **Draft Supplemental Environmental Impact Report** (the 2017 DSEIR), Los Angeles Harbor Department (LAHD) admits having failed to implement some of the air quality mitigation measures that were requisite to its permit to construct the China Shipping (CS) Container Terminal; and proposes a revised mitigation plan which further delays, relaxes, or in some cases neglect implementation of the requisite mitigation measures altogether. I reviewed the emission-related information presented in the 2017 DSEIR and arrived at some findings and recommendations organized around 3 key issues or questions:

1. what can be understood about the CS Container Terminal's emissions as reported or implied by the 2017 DSEIR;
2. is any key information missing or technically insufficient; and
3. what should be done to address missing or insufficient information?

Only once these insufficiencies have been addressed can one attain a meaningful understanding of the air quality impacts that have been caused by LAHD's failure to implement the approved plan, as well as the future impacts that can be expected to occur under the LAHD's revised and relaxed mitigation plan. I briefly summarize my findings and recommendations as follows.

What can be understood about CS Container Terminal's emissions from the 2017 DSEIR?

NRDC.I1-1

Failure to implement <u>all</u> of the previously approved mitigation measures has resulted in significant excess emissions of air pollutants and exposure to these emissions in the community surrounding the Port of LA. Excess emissions are the mass of air pollutants above and beyond the emissions that

NRDC.I1-1

should have been emitted had the mitigation plan from the 2008 EIR been followed as approved. Excess emissions and exposures began to occur in 2005 (the first year that mitigation goals were missed), are ongoing at significant levels through today, and are expected to continue beyond 2025 to a lesser extent (after the relaxed mitigation schedule presented in the 2017 DSEIR begins to approach the approved schedule[1]).

NRDC.I1-2

Information included in the 2017 DSEIR represents an acknowledgement by LAHD that significant excess emissions are occurring. The 2017 DSEIR indicates that 0.6 tons of excess peak daily NO_x emissions were emitted in 2014 (i.e., the difference between 9396 lb/day and 8193 lb/day after conversion to tons) (figures quoted from Table 3.1-5, page 3.1-37 of the DSEIR). This excess 0.6 tons NO_x—which is equal to about 1200 lbs NO_x—is far above the significance threshold for action (only 55 lbs NO_x) set by the South Coast Air Quality Management District (SCAQMD). Other excess peak-day pollutant emissions indicated in the 2017 DSEIR include $PM_{2.5}$ (18 lb/day), PM_{10} (20 lb/day), VOC (29 lb/day), and SO_x (13 lb/day).

Is key information missing or technically insufficient?

NRDC.I1-3

The excess emissions are even greater than LAHD has represented in the 2017 DSEIR. The air quality sections of the DSEIR contained contradictory, unsubstantiated, and inconsistent statements, assumptions, and calculations—the effects of which are to understate the past actual and future expected emissions from the CS Container Terminal. Scientific and technical flaws uncovered by my review are discussed in detail beginning from page 4 of this memorandum. Stated very briefly, NO_x and $PM_{2.5}$ emission factors for heavy-duty LNG trucks are implausible when judged against published literature; the benefits that could be gained by implementation of AMP for ship hoteling appear to be greatly underestimated; and the choice of year 2014 to represent the so-called "baseline" is unjustified and results in a lowered estimate of excess emissions. These issues combine to minimize the differences between the relaxed mitigation plan proposed in the 2017 DSEIR, the approved plan, and the baseline scenario.

NRDC.I1-4

The authors of the 2017 DSEIR omit key information, obscuring precisely how much excess pollution has been emitted (or is expected) at the CS Container Terminal during 2005-2025 (with the exception of year 2014).[2] This period from 2005-2025 is a critical period for review. It is the window of time when approved mitigation measures were scheduled to gradually phase in (but didn't). Although the

[1] The approved schedule is represented in the 2008 Environmental Impact Report (EIR) (Los Angeles Harbor Department, 2008).

[2] My review of the 2017 DSEIR included the appendices (e.g., Appendices B and D), which also omit the key information needed to determine excess emissions during 2005-2025 (excepting 2014). Emissions reported in Appendix D, Tables 2-7, were estimated using out-of-date emissions models, which render them unsuitable for determining the excess emissions.

NRDC.I1-4

precise quantities of excess pollutants emitted during this period cannot be determined from the 2017 DSEIR alone, excess emissions clearly occurred. These excesses have caused the community near the Port of LA to be exposed to levels of pollutants above those that were agreed to when the mitigation plan represented by the 2008 EIR was approved.

What should be done to address missing or insufficient information?

NRDC.I1-5

Given the information gaps and technical insufficiencies, one cannot meaningfully evaluate LAHD's proposed mitigation plan revisions—not without a fuller understanding of the past and expected impacts that were and/or will be caused by delayed, relaxed, or avoided mitigation measures. LAHD should be required to develop further information and remedy technical deficiencies in the 2017 DSEIR emission inventories before submitting another air quality mitigation plan for review and consideration.

NRDC.I1-6

- The emissions inventories in the 2017 DSEIR, such as those shown in Tables 3.1-9, should be expanded to include the period 2005-2021 and 2025 with supporting information provided in appendices.

NRDC.I1-7

- Technical issues discussed in detail beginning on page 4 of this memorandum should be addressed.

NRDC.I1-8

- Given the extent of the technical issues I have identified, a comprehensive technical quality review should be completed to ensure that no further significant technical issues remain unidentified and/or unresolved. I acknowledge that my review (discussed in this memorandum), focused exclusively on the emissions sources with the greatest expected emissions quantities and/or emissions reductions from approved mitigation measures. A comprehensive review would build upon and extend this work.

NRDC.I1-9

- Concerning selection of the baseline year, a _supplemental_ EIR should rely on the same baseline year and baseline scenario as the original EIR, which in this case would be 2001 and "no-build". Meanwhile, the 2014 so-called baseline scenario—put forth in the 2017 DSEIR—represents elevated emissions levels greater than a 2001 "no-build" scenario, which effectively minimizes the differences when various mitigation scenarios are compared to a baseline. The proposed baseline appears to represent _actual_ 2014 emissions (not 2001 no-build emissions), including emissions from the operations of the CS Container Terminal during that year. It would be far more justifiable to update the 2001 "no-build" scenario with the latest information and models and use that inventory as a basis of baseline comparison.

Information Gaps and Technical Deficiencies affecting the 2017 DSEIR Emission Inventories

The air quality sections of the DSEIR contained important unsubstantiated statements, assumptions, and calculations. A few particularly problematic statements and conclusions in the 2017 DSEIR are stated as follows.

NRDC.I1-10

- The 2017 DSEIR failed to provide a basis for concluding that for 2023 through 2045, the proposed revised implementation plan will be emissions-equivalent to full implementation of mitigation measures as approved in the 2008 EIR. This flawed conclusion is not supportable; the NO_x and PM emission factors assumed in the 2017 DSEIR for heavy duty trucks were found to be contrary to published literature and were not properly justified. (See discussion beginning on page 9.) STI's independently estimated emissions from heavy-duty trucks for the same time period and conditions are substantially different from those in the 2017 DSEIR.

NRDC.I1-11

- The 2017 DSEIR appears to inconsistently represent the future-year emissions benefits that would have been gained if alternative maritime power (AMP) for vessel hoteling had been implemented as approved. (See discussion beginning on page 12; and compare Figures 8-9 to Figures 10-11.)

NRDC.I1-12

- An inconsistency was found in the 2008 EIR itself when comparing the approved mitigation scenario to the unmitigated scenario. For example, the 2010 NO_x emissions from cargo handling equipment associated with the approved mitigation scenario were actually higher than those for the unmitigated scenario (when clearly the opposite is expected). If the 2008 EIR is selected to be used as a reference to compare scenarios in the future, then further investigation and validation of the 2008 emissions estimates is warranted. (See discussion beginning on page 17 and Figure 12.)

The remainder of this document discusses and further illustrates these findings and other comments on the 2017 DSEIR.

Supporting Narratives and Details concerning Information Gaps and Technical Deficiencies affecting the 2017 DSEIR Emission Inventories

Project-Wide Emission Inventories

NRDC.I1-13

Project-wide annual emissions estimates for various years and mitigation scenarios were excerpted as available from the 2008 EIR and 2017 DSEIR and are plotted side-by-side to facilitate comparisons. (**Figures 1 and 2** are examples for NOx and $PM_{2.5}$). All years of interest are included on the plots, whether or not the emissions estimates were presented in the 2017 DSEIR. The extent of the information omitted from the 2017 DSEIR is apparent from the amount of blank space in the figures. Ideally, at least one pair of gray bars representing both (a) the fully mitigated scenario and (b) the proposed revised mitigation scenario would appear for each year of interest. However, only future years 2023, 2030, and 2045 are represented in this manner by the 2017 DSEIR. Further years of interest include most years from 2005-

NRDC.I1-13

2025 and the original baseline year, 2001. These years collectively represent: (1) years when approved mitigation measures failed to be implemented; (2) alternative proposed baseline years; and (3) years in which the 2017 DSEIR identifies a potential to exceed a SCAQMD threshold of significance. The following observations can be drawn from a review of Figures 1 and 2.

- First, one must acknowledge that for the 2017 DSEIR, emission inventories were prepared by using the most up-to-date information and models currently available, such as actual activity data for the port, updated projections of future port activities, and the latest available emissions models (e.g., EMFAC 2014).[3] **Using updated information and models significantly affected the estimated emissions** for recent and future years. For example, Figure 1 illustrates a 21% difference in the expected peak daily NO_x emissions for year 2030. (Compare "• 2008 EIR; Fully Mitigated Scenario" to "■2017 DSEIR; Fully Mitigated Scenario".) These types of differences are to be expected; however, they complicate or even obscure meaningful comparisons between the 2008 EIR and the 2017 DSEIR. It is critical to re-generate the 2001 original baseline inventory using the updated information and models so that appropriate direct comparisons can be made.

NRDC.I1-14

- The 2008 EIR showed that, at the time of its writing, **approved mitigation measures were expected to produce significant emissions benefits** by 2015 and in future years. For example, a 70% reduction in the peak daily 2015 NO_x emissions was expected relative to the unmitigated scenario. (Compare "2008 EIR; Fully Mitigated Scenario □" to "2008 EIR; Unmitigated Scenario □" for 2015—i.e., 18,933 versus 5,663 lbs NO_x/day.) $PM_{2.5}$ emissions were expected to drop by 85% by 2015.

NRDC.I1-15

- **Actual 2014 emissions were greater than those estimated for the fully mitigated scenario in the 2017 DSEIR.** The difference represents excess emissions above the emissions that would have occurred if mitigation measures had been implemented as approved through 2014. For example, 1203 lb excess peak daily NO_x emissions were emitted in 2014 (i.e., 9396 lb/day minus 8193 lb/day). (Compare "**---** 2014 Baseline" to "■2017 DSEIR; Fully Mitigated Scenario".) **However, analogous information necessary to estimate excess emissions was omitted from the 2017 DSEIR for the remainder of the period 2005-2025**—i.e., the period when the non-implemented air quality mitigations were expected to gradually phase in (but didn't).

NRDC.I1-16

- **Ignoring the illegal excess emissions between 2005 and 2025,** the 2017 DSEIR suggests that by 2023 through 2045, the proposed revised implementation plan will be equivalent to the fully mitigated scenario. (Compare "■ 2017 DSEIR; Revised Mitigation Scenario" to "■2017 DSEIR; Fully Mitigated Scenario.) **However, this conclusion is not sufficiently supported in the 2017 DSEIR due to the technical deficiencies discussed through the remainder of this document.**

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[3] For the 2008 EIR, EMFAC2007 was applied (e.g., see page 3.2-26 in Section 3.2 of the 2008 Draft EIR document; page 3-63 in Chapter 3 of the 2008 Final EIR document). For the 2017 DSEIR, EMFAC2014 was applied (see page 3.1-29 in Section 3.1 of the DSEIR document).

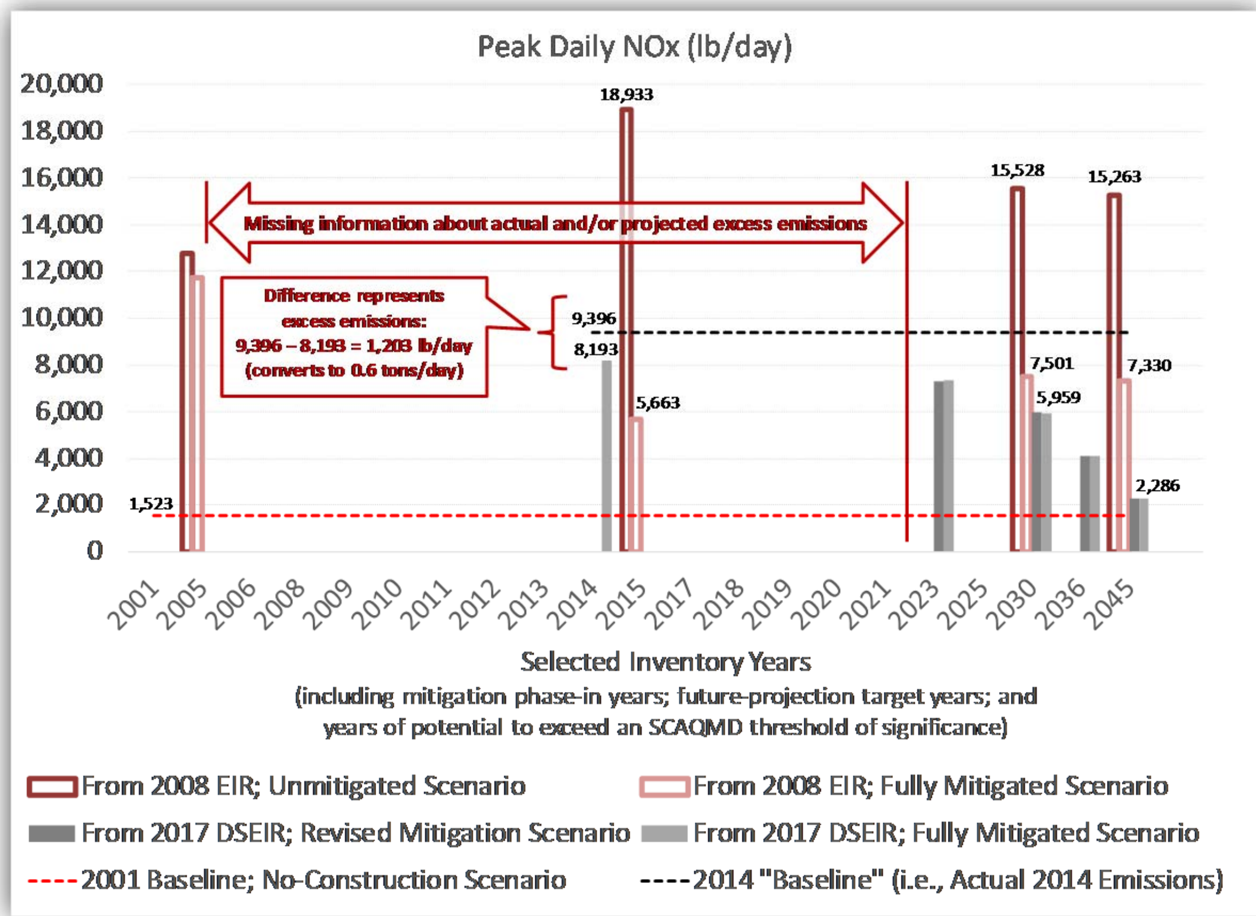

Figure 1. Comparison of project-level NO_x emissions as represented in the 2008 EIR and 2017 DSEIR.[4]

[4] **Figures 1-2 legend definitions:**

2008 EIR: Scenario is represented in the 2008 EIR and represents the information and emissions models available at the time the 2008 EIR was developed.

2017 DSEIR: Scenario is represented in the 2017 DSEIR and represents the latest updated information and emissions models currently available.

Unmitigated: Scenario represents emissions that would be expected if the CS Container Terminal were constructed without any implementation of air quality mitigation measures.

Fully Mitigated: Scenario represents emissions that would be expected if all approved mitigation measures had been implemented as specified in the 2008 EIR.

Revised Mitigation: Scenario corresponds to actual implementation progress (to date) and proposed relaxation of mitigation plans as proposed in the 2017 DSEIR (future years).

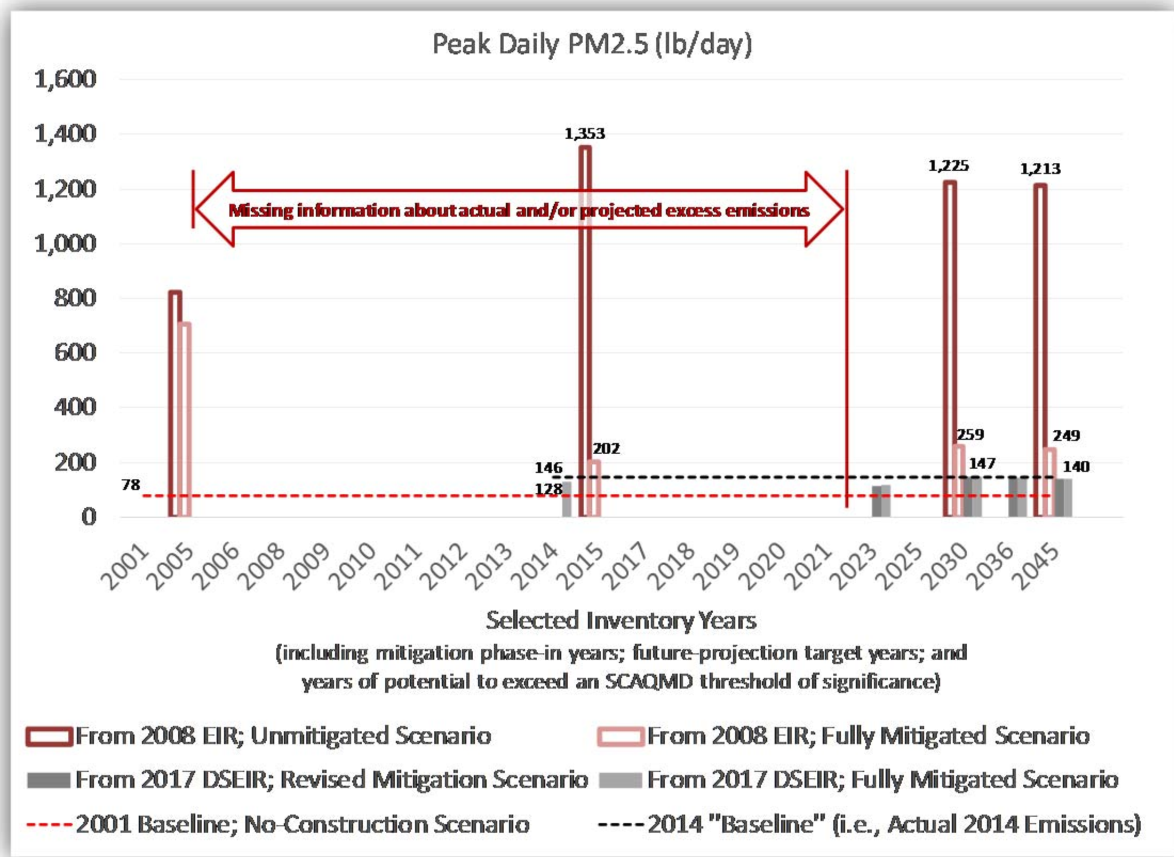

Figure 2. Comparison of project-level $PM_{2.5}$ emissions as represented in the 2008 EIR and 2017 DSEIR.

Review of Selected High-Impact Mitigation Measures and Emissions Sources

NRDC.I1-17

Selected mitigation measures affecting heavy-duty drayage trucks, hoteling of ocean-going vessels, top-pick cargo handlers, and rubber-tired gantry cranes (RTGs) were reviewed in greater detail. These emissions sources were selected for closer review because (a) they contribute significantly to the 2017 emission inventories (see **Figure 3**) and/or (b) the full implementation of approved mitigation measures would have yielded relatively large emissions benefits. The mitigation measures affecting these sources are re-stated briefly as follows (identifier numbers from the 2008 EIR appear in parenthesis).

- Heavy-duty trucks were expected to meet phased requirements from 2012-2018 for operating on liquefied natural gas (LNG) gas power (MMAQ-20).
- Ocean-going vessels (OGV) were expected to meet phased requirements from 2005-2011 for using alternative maritime power (AMP) during ship hoteling (MMAQ-9).
- Cargo handling equipment (CHE) was expected to meet Tier 4 engine standards by the end of 2014; and all RTGs were to be electric-powered by 2009 (MMAQ-15, -16, and -17).

NRDC.I1-17

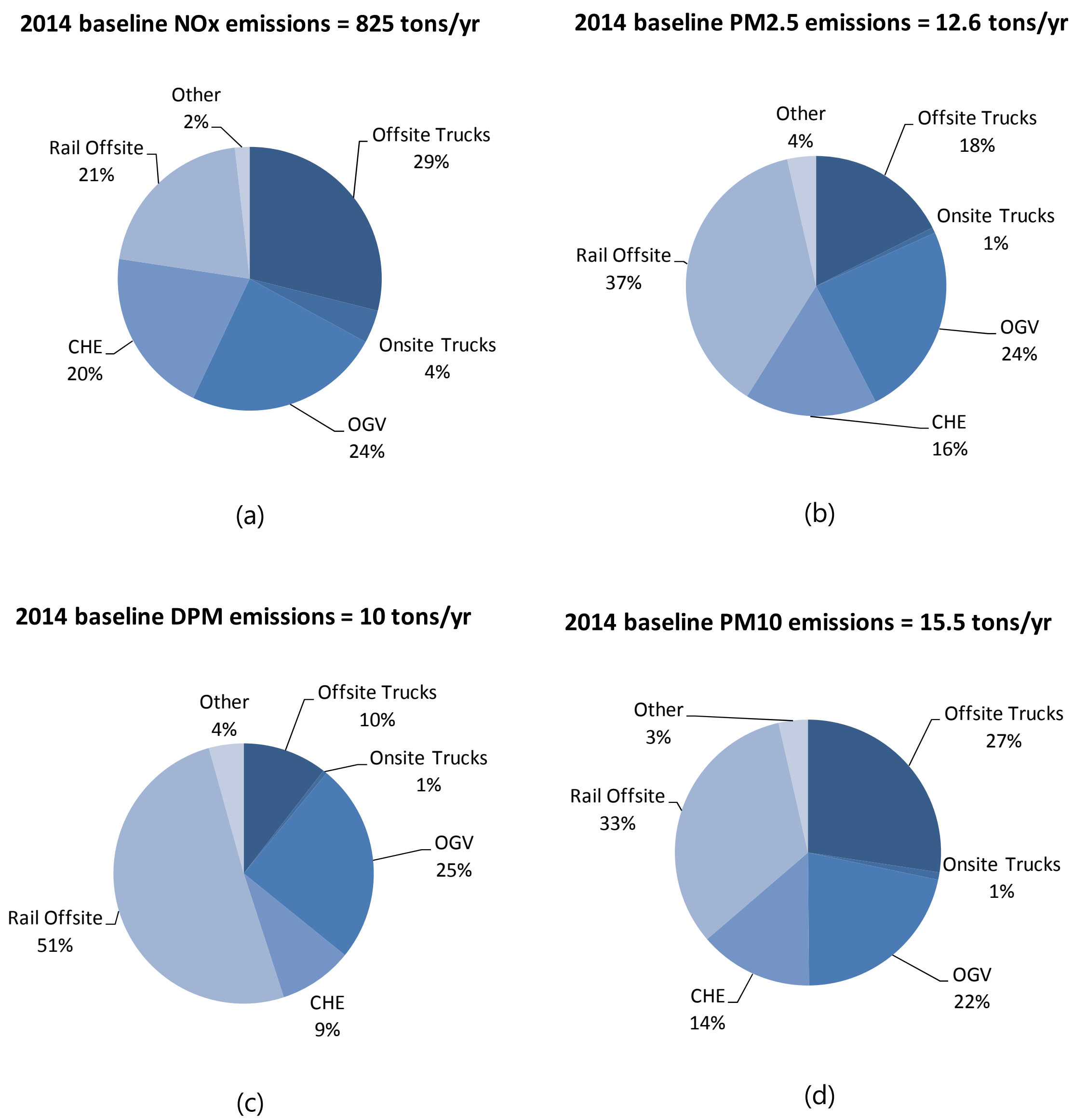

Figure 3. Contributions of major source categories to project-level 2014 annual emissions of (a) NOx, (b) $PM_{2.5}$, (c) DPM emissions, and (d) PM_{10} emissions.

NRDC.I1-17

Figures 4 and 5 illustrate alternative estimates of project-level PM and NO_x emissions for heavy-duty trucks operating within the boundaries of the CS Container Terminal Project. Based on best available information, STI staff working under my direction prepared estimates of annual emissions for two scenarios[5]: (a) implementation of MMAQ-20 as approved ("Estimate - Fully Mitigated Plan" in the figures) and (b) implementation as proposed in the 2017 DSEIR ("Estimate - Relaxed Mitigation Plan" in the figures). These estimates cover several calendar years (2013, 2014, 2017, 2018, and 2023); and they are plotted alongside the analogous emissions estimates from the 2017 DSEIR for year 2023—i.e., the only comparable year covered in the 2017 DSEIR. **STI's estimates show the excess emissions from heavy-duty trucks occurring, while the information from the 2017 DSEIR either omits (2013-2018) or even suggests no benefit from the approved mitigation plan in 2023.**[6] Note that by ignoring years earlier than 2023, the 2017 DSEIR takes advantage of an EMFAC-projected conversion of the vehicle fleet in 2023 to modern emissions standards—after which time, diesel and LNG trucks are expected to emit PM at similar rates. In other words, federal or statewide regulations are expected to yield a large drop in PM emissions from diesel vehicles in 2023, regardless of which mitigation scenario is in effect at the CS

NRDC.I1-18

Container Terminal. However, the lack of NO_x benefits projected for 2023 in the 2017 DSEIR is unsupported. LNG vehicles are known to emit NO_x at a much reduced rate compared to diesel vehicles. However, the **NO_x emission factors used in the 2017 DSEIR for heavy-duty trucks are contrary to published literature**. Not only are the emission factors for diesel-fueled trucks set to be equal to those for LNG-fueled trucks in the 2017 DSEIR, but the NO_x emission factors for heavy-duty trucks increase from 2023 to 2045 (see **Figure 6**). Both of these patterns are contrary to published literature.[7]

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[5] Our estimates are based on emissions studies by Chandler et al. (2000a), Chandler et al. (2000b), Chandler et al., (2001), and City of Los Angeles Bureau of Sanitation (2004).

[6] A note concerning drayage truck duty-cycles as represented in EMFAC modeling: According to the EMFAC2014 Technical Support Document (see https://www.arb.ca.gov/msei/downloads/emfac2014/emfac2014-vol3-technical-documentation-052015.pdf), the EMFAC base emission rates were derived using three types of dynamometer test cycles. These test cycles do not reflect specific base emission rates of drayage trucks: (1) Urban dynamometer driving schedule (UDDS; see https://www.dieselnet.com/standards/cycles/udds.php); (2) heavy heavy-duty diesel trucks (HHDDT; see https://www.dieselnet.com/standards/cycles/hhddt.php); and (3) high speed cruise mode (see https://www.arb.ca.gov/msprog/hdlownox/files/02workshop_11032016-emfac2014_inventory.pdf).

[7] A note concerning University of California—Riverside's (UCR) research findings on in-use LNG and diesel trucks (see their summary at http://www.cert.ucr.edu/news/2017/2017-02-01.html and full report at http://www.cert.ucr.edu/research/efr/2016%20CWI%20LowNOx%20NG_Finalv06.pdf). The key findings from the UCR's work include: (a) the cleanest heavy-duty natural gas engine currently available is certified by ARB at 0.02 g/bhp-hr, 90% cleaner than the cleanest certified heavy-duty diesel engine (at 0.2 g/bhp-hr); and; and (b) 2010 diesel truck with selective catalytic reduction (SCR) was tested with 1.02 g/bhp-hr NOx emission rate, 5 times higher than its EPA certification standard.

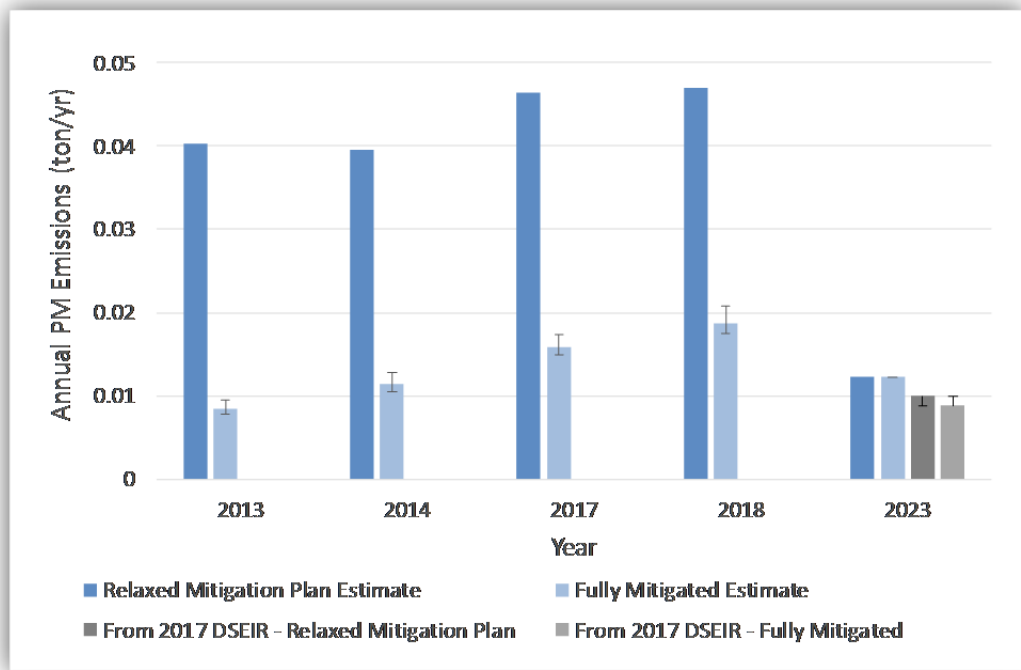

Figure 4. Comparison of alternative estimates of annual PM emissions from on-site trucks.

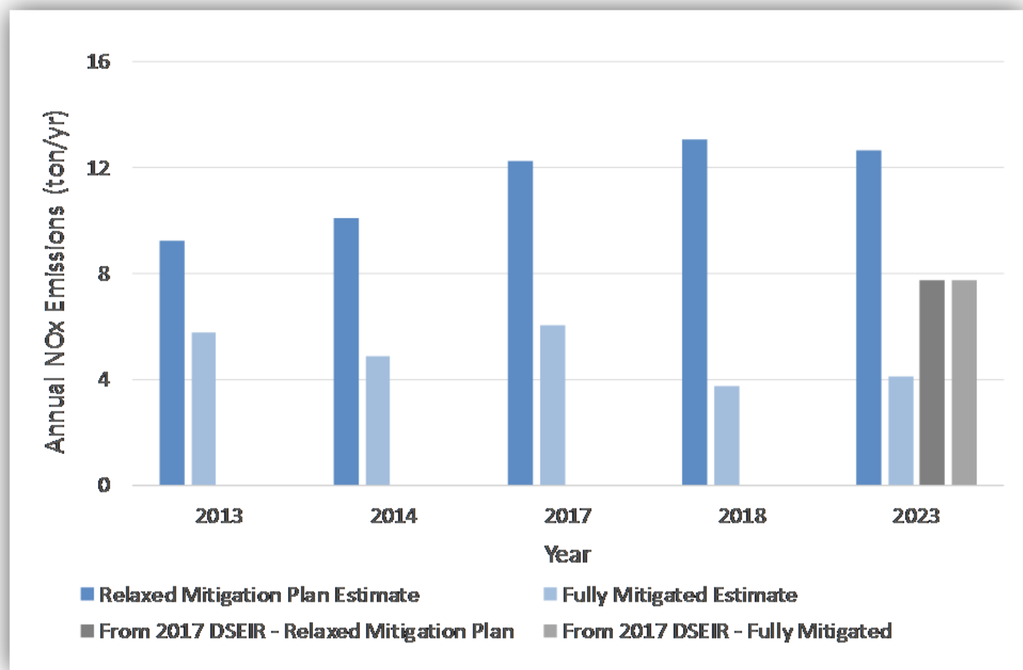

Figure 5. Comparison of alternative estimates of annual NO_x emissions from on-site trucks.

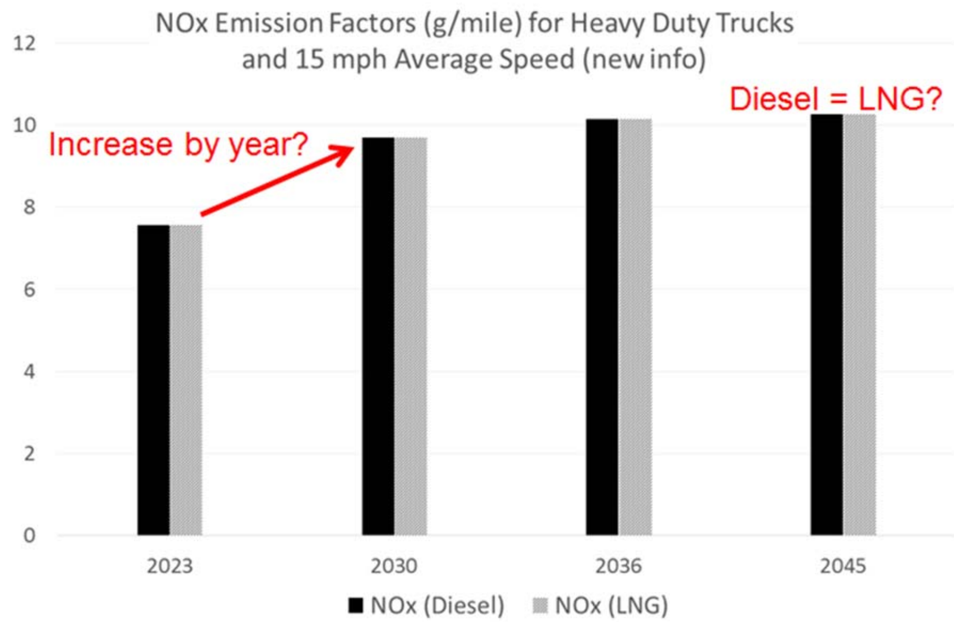

Figure 6. NO_x emission factors applied for heavy-duty trucks in the 2017 DSEIR.

Additional examples of the contradictory, unsubstantiated, and inconsistent statements, assumptions, and calculations in the air quality sections of the 2017 DSEIR include:

NRDC.I1-19

- **The 2017 DSEIR failed to report the excess emissions from failure to comply with the approved mitigation measures related to hoteling of OGVs and cargo handling equipment.** Similar to our previous observation concerning the comprehensive project-level emissions inventory, information necessary to calculate excess emissions are not presented in the 2017 DSEIR during a critical period when approved mitigation measures were expected to gradually phase in (but didn't). Furthermore, we noted an inconsistency when reviewing the emissions for OGVs. Figures 7 and 8 illustrate project-level, peak-day NO_x and $PM_{2.5}$ emissions for hoteling of OGVs as presented in the 2017 DSEIR and 2008 EIR; and for comparison, Figures 9 and 10 illustrate analogous *average-day* emissions. Under the revised mitigation measures plan proposed in the 2017 DSEIR, OGVs should be using alternative maritime power (AMP) during ship hoteling with a 95% compliance rate by 2018. Accordingly, the differences are expected to be small when comparing the approved mitigation plan and the relaxed mitigation plan for OGV emissions in years later than 2018. Figures 7 and 8 do show small differences in peak-day emissions post-2018; but Figures 9 and 10 show large differences and the reason for this inconsistency is unclear.

NRDC.I1-19

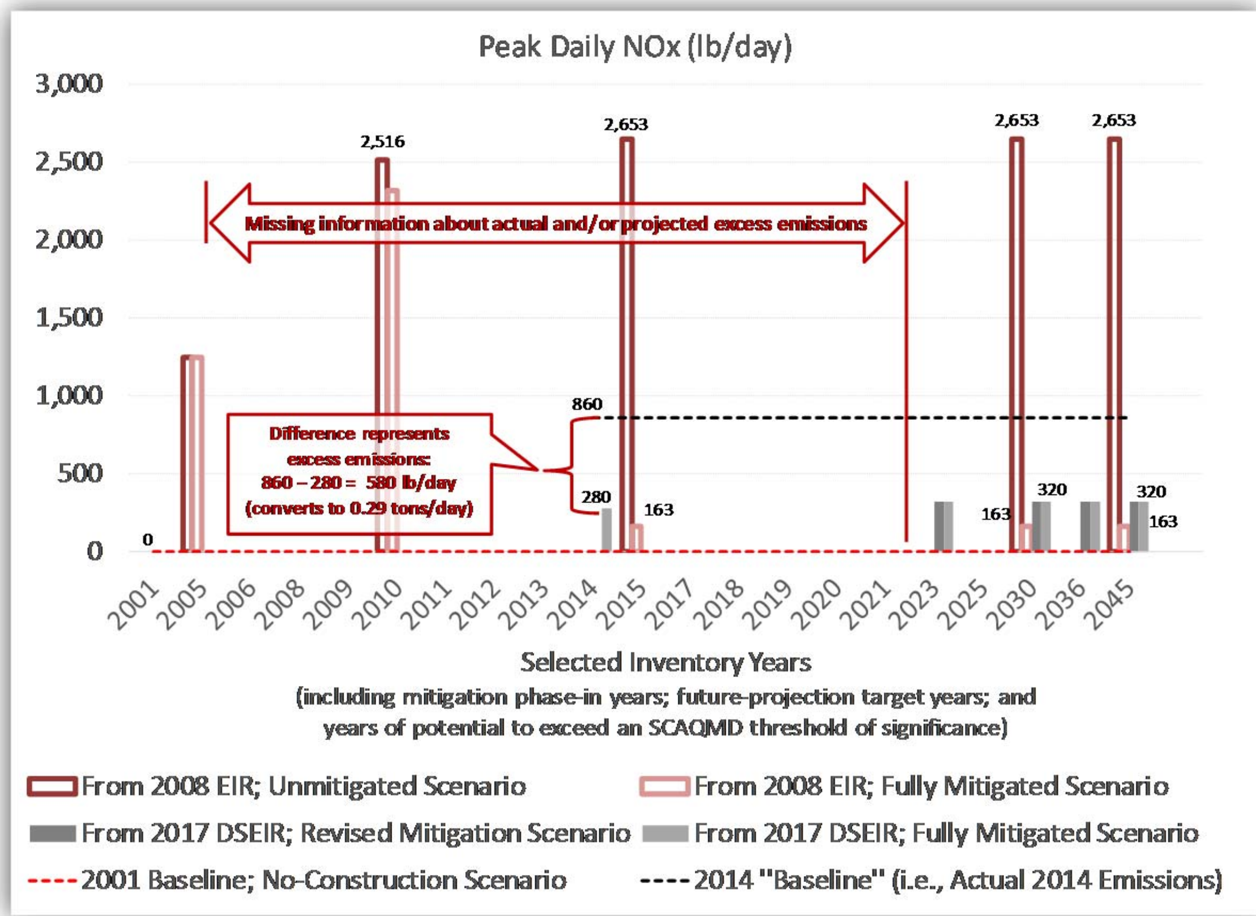

Figure 7. Comparison of various peak-day NO_x emissions scenarios for hoteling of OGVs as represented in the 2008 EIR and 2017 DSEIR.[4]

NRDC.I1-19

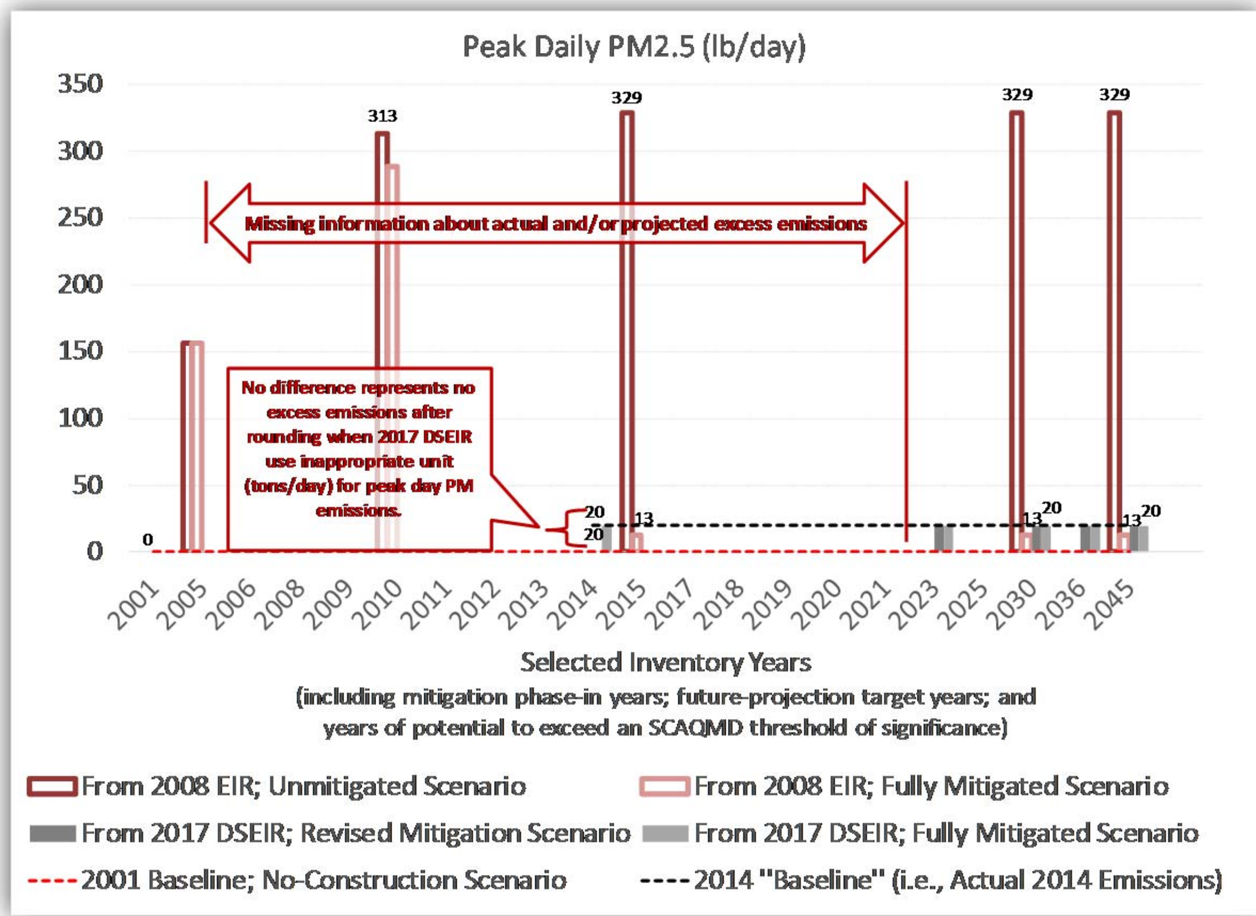

Figure 8. Comparison of various peak-day $PM_{2.5}$ emissions scenarios for hoteling of OGVs as represented in the 2008 EIR and 2017 DSEIR.[4]

NRDC.I1-19

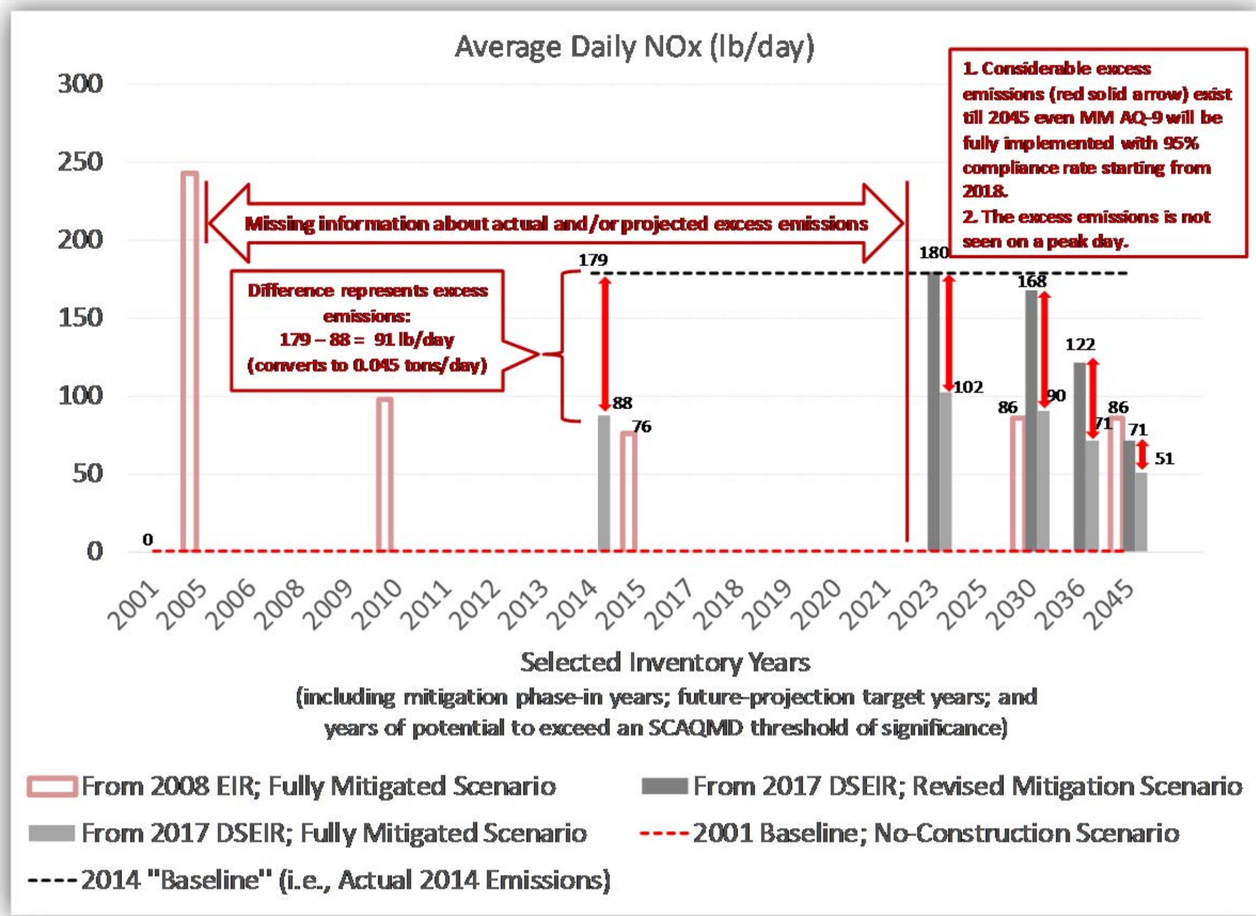

Figure 9. Comparison of various average-day NO_x emissions scenarios for hoteling of OGVs as represented in the 2008 EIR and 2017 DSEIR.[4]

NRDC.I1-19

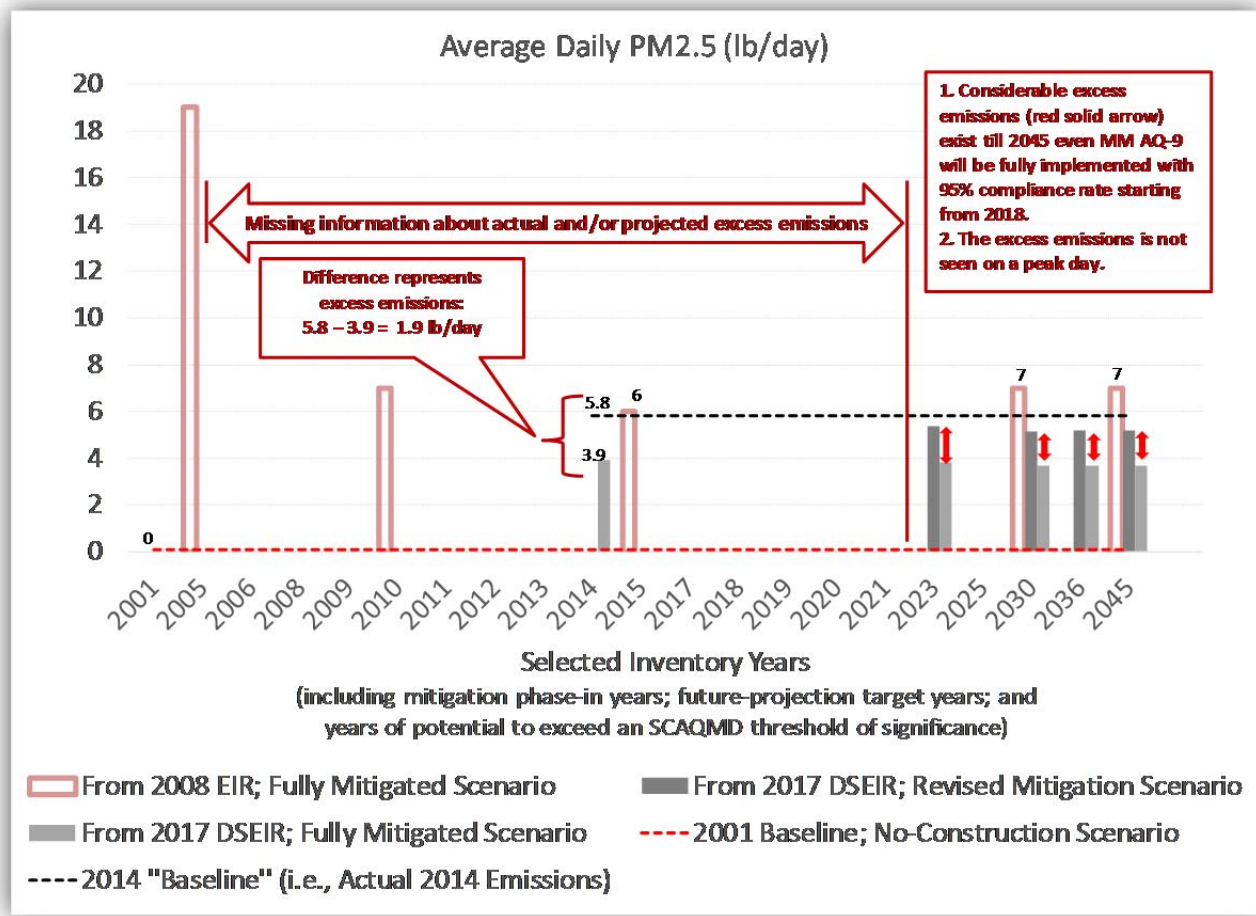

Figure 10. Comparison of various average-day $PM_{2.5}$ emissions scenarios for hoteling of OGVs as represented in the 2008 EIR and 2017 DSEIR.[4]

NRDC.I1-20

- Figures 11 and 12 illustrate project-level, peak-day NO_x and $PM_{2.5}$ emissions for cargo-handling equipment. An inconsistency issue was found in the 2008 EIR for analysis year 2010 where emissions for the approved mitigation scenario are greater than the emissions for the unmitigated scenario. If emissions from the 2008 EIR are used as a basis for comparison, estimates for these two scenarios need to be verified.

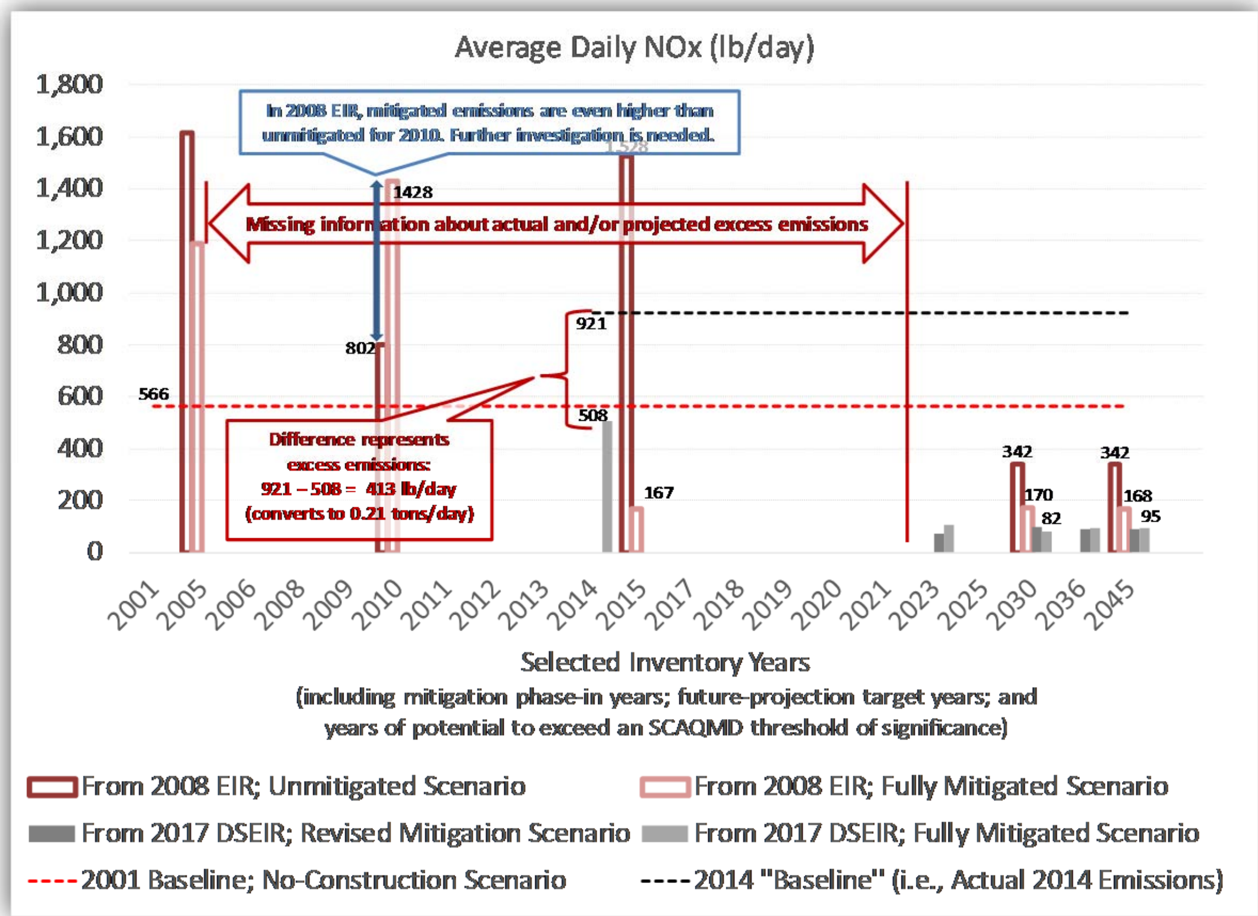

Figure 11. Comparison of various NO_x emissions scenarios for cargo handling equipment as represented in the 2008 EIR and 2017 DSEIR.[4]

NRDC.I1-20

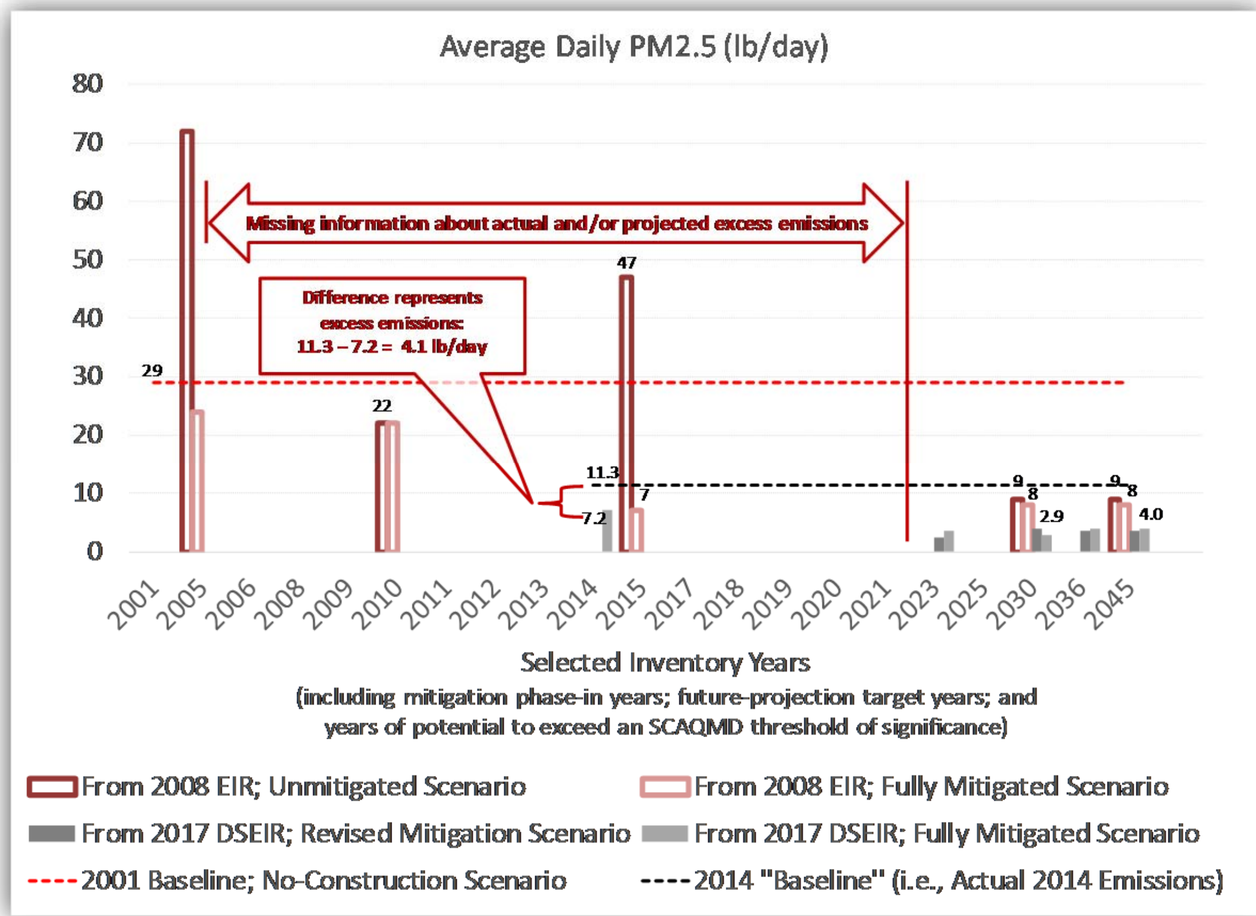

Figure 12. Comparison of various $PM_{2.5}$ emissions scenarios for cargo handling equipment as represented in the 2008 EIR and 2017 DSEIR.[4]

Professional Qualifications: Lyle R. Chinkin

I, **Lyle R. Chinkin**, currently serve as the Chief Scientist at Sonoma Technology. Inc. (STI) and hold the title of President Emeritus. I am a nationally recognized expert in emission inventory preparation, emission inventory assessment, and air quality analysis. I have over 30 years of professional consulting experience in air quality, in addition to more than five years of professional experience at the California Air Resources Board (ARB). My areas of expertise include (1) developing and improving regional emission inventories; (2) providing independent assessments of emission inventories using bottom-up and top-down evaluation techniques; (3) conducting field studies to obtain real-world data and improve activity estimates and emission factors; (4) conducting scoping studies to develop conceptual models of community-scale air quality; and (5) providing expert testimony and presentations to public boards. I was co-author of the U.S. Environmental Protection Agency's national guidance document on the preparation of emission inputs for photochemical air quality simulation models. A full resume is attached to this document.

This document includes my review of the 2017 Draft Supplemental Environmental Impact Report (DSEIR) for the China Shipping Container Terminal Project (Los Angeles Harbor Department, 2017). The review involved independent evaluation of the emissions calculations presented in the 2017 DSEIR and assessment of excess emissions from the CS Container Terminal Project due to non-compliance and/or incomplete implementation of the mitigation measures set forth in the 2008 Environmental Impact Report (EIR) (Los Angeles Harbor Department, 2008). To complete this independent review, STI staff, at my direction, obtained various data and supporting documents for the 2017 DSEIR and the 2008 EIR provided by the Port of Los Angeles to the Natural Resources Defense Council (NRDC) attorneys. Publicly available information was also used as reference material to support this review. The opinions expressed in this document are my own and are based on the data and facts available at the time of writing. Should additional relevant or pertinent information become available, I reserve the right to supplement the discussion and findings in this document.

References Cited

Chandler K., Norton P., and Clark N. (2000a) Raley's LNG truck fleet final results: alternative fuel truck evaluation project. Prepared for the U.S. Department of Energy by the National Renewable Energy Laboratory, Battelle, and West Virginia University, NREL/BR-540-27678, May.

Chandler K., Norton P., and Clark N. (2000b) Dallas Area Rapid Transit's (DART) LNG bus fleet final results: alternative fuel transit bus evaluation. Prepared for the U.S. Department of Energy by the National Renewable Energy Laboratory, Battelle, and West Virginia University NREL/BR-540-28739, October.

Chandler K., Norton P., and Clark N. (2001) Waste Management's LNG truck fleet final results: alternative fuel truck evaluation project. Prepared for the U.S. Department of Energy by the National Renewable Energy Laboratory, Battelle, and West Virginia University, NREL/BR-540-29073, January.

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Kittelson D.B. (2000) Measurement of engine exhaust particle size. Presented at the University of California, Davis, CA, February 17, by the Center for Diesel Research, University of Minnesota.

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Los Angeles Harbor Department (2017) Berths 97-109 [China Shipping] container terminal project. Draft supplemental environmental impact report, June. Available at **https://www.portoflosangeles.org/EIR/ChinaShipping/DSEIR/dseir_china_shipping.asp**.

Response to Comment NRDC.I1-1

Please see response to Comment NRDC-6.

Response to Comment NRDC.I1-2

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable. For more information, see Comments NRDC-6 and NRDC.K1-1.

Response to Comment NRDC.I1-3

Part of this comment refers to the 2014 baseline presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, accordingly, that part of the comment is no longer applicable. Please see Response to Comment NRDC-15 that addresses other parts of the comment.

Response to Comment NRDC.I1-4

Please see response to Comment NRDC-6.

Response to Comment NRDC.I1-5

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Response to Comment NRDC.I1-6

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Response to Comment NRDC.I1-7

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable.

Response to Comment NRDC.I1-8

This is an introductory comment to comments addressed below.

Response to Comment NRDC.I1-9

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR; accordingly, the comment is no longer applicable. With respect to the baseline, please see Response to Comment NRDC-6.

Response to Comment NRDC.I1-10

Please see Response to Comment NRDC-15.

Response to Comment NRDC.I1-11

Regarding assumptions on ocean-going vessel usage of AMP for years 2023-2045, please see Response to Comment SCAQMD-26.

Response to Comment NRDC.I1-12

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which CHE emissions have been revised; accordingly, the comment is no longer applicable.

Response to Comment NRDC.I1-13

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which additional analysis years have been added to the air quality analysis and peak-day emissions have been updated; accordingly, the comment is no longer applicable.

Response to Comment NRDC.I1-14

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which the air quality analysis and peak-day emissions have been updated; accordingly, the comment is no longer applicable.

Response to Comment NRDC.I1-15

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which additional analysis years have been added to the air quality analysis and peak-day emissions have been updated; accordingly, the comment is no longer applicable. Please see Response to Comment NRDC-6 for a discussion of "excess emissions," as the non-CEQA term is used by the commenter, disclosed in Recirculated DSEIR.

Response to Comment NRDC.I1-16

This comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which additional analysis years have been added to the air quality analysis and peak-day emissions have been updated; accordingly, the comment is no longer applicable. Please see Response to Comment NRDC-6 for a discussion of the so-called "excess emissions," as the non-CEQA term is used by the commenter, disclosed in Recirculated DSEIR.

Response to Comment NRDC.I1-17

The first part of this comment (Figure 3, page 7 and 8) refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which additional analysis years have been added to the air quality analysis and peak-day emissions have been updated; accordingly, this part of the comment is no longer applicable.

For the second part of this comment (page 9), LAHD disagrees with the claim that the EIR's air quality analysis used an EMFAC-projected (default) conversion of the vehicle fleet. The drayage truck emission rates are based on future projections of the port-area-wide drayage fleet produced for the Port Emission Inventories (LAHD 2019), which include effects of local and state regulations, including the Clean Truck Program.

Please see Response to Comment NRDC-6 for a discussion of the so-called "excess emissions" disclosed in Recirculated DSEIR.

Response to Comment NRDC.I1-18

Please see Response to Comment NRDC-15 for a discussion of emission factors for LNG drayage trucks.

Response to Comment NRDC.I1-19

Figures and data discussed in this comment refers to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, where the AQ analysis, baseline and peak day emissions have been updated, accordingly, the comment is no longer applicable. Please see Response to Comment NRDC-15 for a discussion on OGV emissions.

Response to Comment NRDC.I1-20

Figures and data discussed in this comment refer to material presented in a previous draft (the DSEIR). That document has been superseded by the Recirculated DSEIR, in which additional analysis years have been added to the air quality analysis and peak-day emissions have been updated; accordingly, the comment is no longer applicable.

2.3.2.11 Richard Havenick

October 30, 2018

City of Los Angeles Harbor Department
Christopher Cannon, Director
Environmental Management Division
P.O. Box 151
San Pedro CA 90733-0151

Subject: Berths 97-109 [China Shipping] Container Terminal Project (SCH#2003061153) Comments Submittal

To whom it may concern,

For the Subject Project and for the failure to comply with the mitigations defined in the respective Year 2008 Environmental Impact Report for the China Shipping Project, please respond to the following recommendations.

HAVENICK- 1 1) State the cause of the Port's management or system failure that resulted in tenant's violation of the referenced 2008 EIR and state the correction(s) that will preclude a repeat failure to comply with required environmental mitigations by Port tenants.

HAVENICK-2 2) State the cause of the Port's failure to perform per the Mitigation Monitoring and Reporting Program and the correction(s) that will ensure future compliance.

HAVENICK-3 3) Evaluate whether other required mitigations were not performed elsewhere in the Port, unrelated to China Shipping, and state the conclusion of the evaluation.

HAVENICK-4 4) Develop and implement a process to present yearly to the public a listing of Mitigations required with their respective phases of completion.

HAVENICK-5 5) As emissions of carbon monoxide, nitrogen oxides, and volatile organic compounds will be significant over multiple years, state the actions to reduce emissions of the listed pollutants elsewhere in the Port to ensure no net increase in the respective emissions and to remain consistent with the San Pedro Bay Ports Clean Air Action Plan.

HAVENICK-6 6) As cancer risks would be significant for residential, sensitive, and occupational receptor types, state the actions to reduce cancer risk elsewhere in the Port to ensure no net increase in the respective cancer risks and to remain consistent with the San Pedro Bay Ports Clean Air Action Plan.

HAVENICK-7 7) State the expected date (or time period) when the new lease amendment is expected to be filed.

Thank you.

Richard Havenick

Coastal San Pedro Neighborhood Council Stakeholder
3641 South Parker Street
San Pedro CA 90731

Response to Comment HAVENICK-1

Please see Response to Comment CSPNC-2.

Response to Comment HAVENICK-2

Please see Responses to Comments CSPNC-1 and CSPNC-2.

Response to Comment HAVENICK-3

Please see Responses to Comments CSPNC-2 and CSPNC-3.

Response to Comment HAVENICK-4

Please see Response to Comment CSPNC-4.

Response to Comment HAVENICK-5

This is not a comment on the adequacy of the Recirculated DSEIR. Discussion of mitigation measures and other pollution-reduction actions for Port projects other than the Revised Project is outside the scope of this SEIR and is not required by CEQA. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

Response to Comment HAVENICK-6

Please see Response to Comment Havenick-5.

Response to Comment HAVENICK-7

Please see Response to Comment CoSPNC-4.

2.3.2.12 Tony Briganti

Ochsner, Lisa

From: Tony Briganti <ynotony2001@yahoo.com>
Sent: Wednesday, November 14, 2018 11:46 AM
To: Ceqacomments
Subject: Fw: PUBLIC COMMENT: mitigation issues avoided for 10+ years

I am hereby authoring this e-mail + attachments to you from Anthony Briganti. . . Send verified by Tony

----- Forwarded Message -----
From: Tony Briganti <ynotony2001@yahoo.com>
To: environmental@portla.org <environmental@portla.org>
Sent: Monday, November 12, 2018, 11:07:17 AM PST
Subject: PUBLIC COMMENT: MITIGATION ISSUES BEING AVOIDED

BRIGANTI-1

I have worked at the Long Beach Naval Shipyard for 22 years and lived in the vicinity of the Port of Los Angeles (POLA) for 74 years, and I just need to make a public comment about the recent mitigation issues that have been purposely avoided for years regarding the China Shipping Terminal and its "recirculated draft supplemental environmental impact report (SEIR)" settlement agreement since at least 2015. This has NOT been addressed in a timely manner and should be completed HERE AND NOW by the managers at Port of Los Angeles / China Shipping Terminal mitigation committee.
Furthermore, PRIMARILY. . . if the management at POLA cannot solve this issue then State Lands Commission ought to step in to complete adequate and efficient stewardship to ensure competent action immediately so that it may ultimately be responsible for control.
If this is not the place for these public comments, please inform me as to where to make one at this late date.
Call my phone or email for further contact #562-298 7320.

I am hereby authoring this e-mail + attachments to you from Anthony Briganti. . . Send verified by Tony

Response to Comment BRIGANTI-1

The comment is noted and is hereby part of the Final SEIR, and is therefore before the decision-makers for their consideration prior to taking any action on the Revised Project. The comment is general and does not reference any specific section of the Recirculated DSEIR, therefore no further response is required (Public Resources Code § 21091(d); CEQA Guidelines § 15204(a)).

2.3.2.13 Public Hearing Comments

BERTHS 97-109 {CHINA SHIPPING}

CONTAINER TERMINAL PROJECT

RECIRCULATED DRAFT SUPPLEMENTAL EIR PUBLIC HEARING

LOS ANGELES HARBOR DEPARTMENT

ENVIRONMENTAL MANAGEMENT DIVISION

425 S. PALOS VERDES STREET

SAN PEDRO, CALIFORNIA

THURSDAY, OCTOBER 25, 2018

6:05 P.M.

OLIVIA D. LIZARRAGA,
CERTIFIED STENOGRAPHIC REPORTER NO. 13475

JOB NO. 159197
PAGES 1 THROUGH 14

SAN PEDRO, CALIFORNIA, THURSDAY, OCTOBER 25, 2018

(6:05 P.M.)

~OOO~

MR. SEROKA: GOOD EVENING, LADIES AND GENTLEMAN, MEMBERS OF THE PUBLIC, DISTINGUISHED GUESTS, AND HARBOR DEPARTMENT STAFF. MY NAME IS GENE SEROKA. I AM THE EXECUTIVE DIRECTOR HERE, AT THE PORT OF LOS ANGELES, AND THANK YOU FOR JOINING US AT THE PUBLIC MEETING FOR THE RECIRCULATED DRAFT SUPPLEMENTAL ENVIRONMENTAL IMPACT REPORT.

HERE WITH ME THIS EVENING IS DIVISION HEAD CHRIS CANNON, WHO WILL TAKE US THROUGH A POWERPOINT AND A LITTLE BIT ABOUT WHAT WE'RE GOING TO BE DOING THIS EVENING.

CHRIS?

MR. CANNON: THANK YOU VERY MUCH FOR COMING. THE PURPOSE OF THIS MEETING, IT'S A PUBLIC HEARING FOR AN ENVIRONMENTAL IMPACT REPORT THAT'S PROVIDED OVERVIEW AND FINDINGS OF THE RECIRCULATED DRAFT SUPPLEMENTAL EIR AND TO PROVIDE INFORMATION ABOUT THE PROPOSED PROJECT CHANGES.

WE'LL TRY THAT AGAIN --

THANK YOU FOR COMING TONIGHT, AND MY NAME IS . CHRIS CANNON. I'M DIRECTOR OF ENVIRONMENTAL MANAGEMENT AT THE PORT. I AM HERE TO PROVIDE A LITTLE BIT OF AN OVERVIEW OF INFORMATION ABOUT THE PROPOSED PROJECT AND THE PROJECT CHANGES, WHICH WOULD BE THE REVISED PROJECT, AND THEN PROVIDE

AN OVERVIEW AND FINDINGS OF THE DRAFT RECIRCULATED SUPPLEMENTAL EIR AND TO OBTAIN PUBLIC COMMENTS.

WE HAVE SPANISH TRANSLATION AVAILABLE FOR ANYBODY WHO NEEDS IT. AND, ALSO, IF ANYBODY NEEDS TO FILE A -- FILL OUT A COMMENT CARD, THEY'RE AVAILABLE UP THERE IN THE FRONT.

I WANT TO POINT OUT THAT WE DON'T ANSWER QUESTIONS AT A PUBLIC HEARING. OUR JOB IS TO LISTEN TO YOU; THAT'S WHAT WE'RE HERE TO DO. AND ANY QUESTIONS OR ANY COMMENTS THAT YOU HAVE WILL BE WRITTEN DOWN AND THEY WILL BE RESPONDED TO AS PART OF THE NORMAL PROCESS OF AN ENVIRONMENTAL IMPACT REPORT.

SO OUR PROCESS, THEN, IS WE HAD AN ORIGINAL FINAL EIS/EIR. IT WAS CERTIFIED IN DECEMBER OF 2008. THERE WAS A NOTICE OF PREPARATION ISSUED FOR A SUPPLEMENTAL EIR IN SEPTEMBER OF 2015. WE HAD A SCOPING MEETING SHORTLY AFTER THAT. THE DRAFT SUPPLEMENTAL EIR WAS RELEASED FOR PUBLIC REVIEW IN JUNE OF 2017, WHEN WE HAD A PUBLIC HEARING. IN JULY OF 2017, WE THEN CHOSE TO RECIRCULATE THE DOCUMENT. THERE IS A RECIRCULATED DRAFT -- CIRCULATED DRAFT SUPPLEMENTAL EIR RELEASED FOR PUBLIC REVIEW ON SEPTEMBER 28, 2018. THERE IS A PUBLIC HEARING TODAY, AND THEN FINAL SUPPLEMENTAL EIR CERTIFICATION, WE ANTICIPATE, EARLY TO MID 2019.

JUST QUICKLY, THE PROPOSED PROJECT IS -- SITE IS LOCATED AT 2050 JOHN S. GIBSON BOULEVARD WITHIN THE WEST

BASIN CONTAINER TERMINAL AREA OF THE PORT OF LOS ANGELES. AS YOU CAN SEE FROM THE MAPS THERE, GENERALLY, IT'S THE TRAPAC -- OR, EXCUSE ME, THE YANG MING AND TRAPAC FACILITIES ARE JUST TO THE NORTH. THE WEST BASIN, ITSELF, IS JUST TO THE EAST. THE 110 FREEWAY IS TO THE WEST. AND TO THE SOUTH, ALSO, IS THE CRUISE TERMINAL AND THE 110 FREEWAY, AS WELL AS THE COMMUNITY OF SAN PEDRO.

SO THIS IS JUST A BETTER PICTURE OF THE PROJECT SITE. YOU CAN SEE IT THERE. IT'S SHOWN IN RED, INCLUDING THE RAIL YARD THERE AS IT EXTENDS UP ALONG THE LEFT AND TO THE TOP.

SO TO PROVIDE A QUICK PROJECT OVERVIEW, THE 2008 CHINA SHIPPING FINAL EIR ADOPTED 52 MITIGATION MEASURES AND LEASE MEASURES. MOST OF THOSE HAVE BEEN COMPLETED OR ARE ARE IN PROGRESS AND ARE NOT STUDIED IN THIS SUPPLEMENTAL EIR. TEN MITIGATION MEASURES AND ONE LEASE MEASURE HAVE NOT BEEN FULLLY IMPLEMENTED. UNDER THE REVISED PROJECT MODIFICATIONS TO THESE MEASURES ARE BEING PROPOSED BASED ON FEASIBILITY, AFFECTIVENESS, AVAILABILITY OF ALTERNATIVE TECHNOLOGIES, AND OTHER FACTORS. THIS JUST GIVES YOU A LIST OF THE ACTUAL TEN MITIGATION MEASURES AND ONE LEASE MEASURE.

THE ANALYSIS IS BASED ON THE NATURE OF EACH OF THE MITIGATION MEASURES, FOCUSES ON AIR QUALITY, GREENHOUSE GAS, AND GROUND TRANSPORTATION. THERE WERE KEY UPDATES TO THE ANALYSIS, AND THAT'S WHAT'S ASSOCIATED WITH THE RECIRCULATED

DRAFT. BASED ON PUBLIC COMMENTS, THE RECIRCULATED DRAFT AND SUPPLEMENTAL EIR INCORPORATES NEW INFORMATION, SUCH AS A 2008 BASELINE, WHICH I WILL DISCUSS IN MORE DETAIL IN A MOMENT. ADDITIONAL STUDY YEARS, 2012, 2014, AND 2018 CAPTURE PRIOR YEARS, FROM WHEN THE ORIGINAL MITIGATION MEASURES WERE IN EFFECT AND PARTIALLY IMPLEMENTED.

THERE WERE CHANGES TO MITIGATION AND LEASE MEASURES TO ALIGN WITH THE 2017 CLEAN AIR ACTION PLAN, AND COMPLIANCE DATES ARE SET. THEY ARE TRIGGERED WHEN THE LEASE BECOMES EFFECTIVE RATHER THAN JUST FIXED DATES. AND, LASTLY, THE ADDITION OF STREET INTERSECTIONS AND FREEWAY SEGMENTS TO THE TRAFFIC STUDIES IN RESPONSE TO PUBLIC COMMENTS.

THE 2008 EIR ANALYZED THE CHANNEL SHIPPING -- CHINA SHIPPING TERMINAL AT FULL CAPACITY AT 1.55 MILLION TEUs. THAT WAS BASED ON CARGO FORECASTING PERFORMED IN 2005. SINCE THAT TIME, REASSESSMENT OF TERMINAL CAPACITY AND OPERATIONAL CHANGES HAVE OCCURRED. THE MAXIMUM CAPACITY IS NOW ESTIMATED AT 1.70 MILLION TEUs, WHICH IS APPROXIMATELY TEN PERCENT GREATER THAN THE ORIGINAL ESTIMATE, SO A SCREENING ANALYSIS WAS PERFORMED TO ASSESS THE INCREMENTAL INCREASE IN TEU CAPACITY FOR OTHER IMPACT AREAS. WE ALSO ADDED AN ENERGY CONSERVATION ANALYSIS AS PART OF THE REQUIREMENT BY CEQA.

SO I TALKED ABOUT BASELINE. AS MENTIONED PREVIOUSLY, BASED ON SEVERAL COMMENTS, WE CHANGED THE BASELINE. IN THE JUNE 2017 DRAFT SUPPLEMENTAL EIR, WE USED

2014 AS OUR BASELINE, BASED ON WHEN THE N.O.P WAS ISSUED. THE UPDATED ANALYSIS RELIES ON 2000 AND -- IN 2008 AS THE BASELINE TO CAPTURE THE TIME PERIOD WHEN THE PROJECT WAS ORIGINALLY APPROVED IN 2008 AND WHEN SOME MITIGATIONS WERE IN PLACE, OR WHAT WE REFER TO AS THE "PARTIAL IMPLEMENTATION PERIOD." THE 2008 ACTUAL BASELINE IS BASED ON ACTUAL CONDITIONS AS THEY OCCURRED IN 2008, WITH APPROVED MITIGATIONS THAT WERE IN PLACE AND ACTUALLY IMPLEMENTED AT THAT TIME.

THE GROUND TRANSPORTATION, WE RELIED ON THE 2014 MITIGATED BASELINE, WITH ALL THE ORIGINALLY APPROVED MITIGATIONS. 2014 IS THE APPROPRIATE YEAR FOR GROUND TRANSPORTATION BECAUSE THERE WERE NO APPROVED TRAFFIC MITIGATIONS PRIOR TO THAT TIME. BOTH BASLINES CAPTURE THE PERIOD OF PARTIAL IMPLEMENTATION OF MITIGATION MEASURES.

SO THIS LOOKS JUST LIKE THE PREVIOUS SLIDE THAT SHOWED THE MITIGATION MEASURES THAT WERE NOT FULLY IMPLEMENTED IN THE EIR, BUT THIS SLIDE SHOWS HOW WE ARE PROPOSING TO REVISE THOSE MEAUSURES. I WON'T GET INTO THE DETAILS, BUT THE MEASURES WERE REVISED TO MAKE SURE THAT THEY ARE OPERATIONALLY AND TECHNOLOGICALLY FEASIBLE AND TO DETERMINE -- AND/OR TO DETERMINE WHETHER THEY ARE STILL NEEDED.

AS I MENTIONED, SOME OF THE MITIGATION MEASURES AND LEASE MEASURES WERE REVISED TO MORE CLOSELY ALIGN WITH THE

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2017 CAP UPDATE, AND COMPLIANCE STATES WERE ADJUSTED BASED ON WHEN THE LEASE AGREEMENT BECOMES EFFECTIVE RATHER THAN FIXED CALENDAR DATES. THIS IS JUST THE CONTINUATION OF THOSE MEASURES.

SO THE FDIR SHOWS THAT AIR QUALITY IMPACTS RELATED TO PEAK DAILY EMISSIONS OF VOCs, CARBON MONOXIDE, AND NOx FOR MULTIPLE STUDY YEARS OF POLLUTANT CONCENTRATIONS OF N.O.T. AND PM AND PM10 WOULD EXCEED SOUTH COAST AQMD THRESHOLDS. THE HEALTH RISKS WOULD EXCEED THE AQMD THRESHOLD OF TEN IN A MILLION AT RESIDENTIAL AND SENSITIVE RECEPTORS IN THE IMMEDIATE VICINITY OF (INAUDIBLE) SHIPPING AND TERMINALS. THE MAXIMUM INCREMENTAL INDIVIDUAL RESIDENTIAL CANCER RISK IS PREDICTED TO BE 25.4 IN A MILLION (INAUDIBLE.) GREENHOUSE GASSES WOULD EXCEED THE SOUTH COAST 10,000 METRIC TONS OF CO2 EQUIVALENT THRESHOLD.

TRAFFIC IMPACTS WOULD OCCUR AT ALAMEDA AND ANAHEIM STREETS. IF LOS ANGELES DEPARTMENT OF TRANSPORTATION APPROVES MITIGATION MEASURE MM TRANS 2, THEN THE IMPACT AT THAT LOCATION WOULD BE REDUCED TO LESS THAN SIGNIFICANT.

THERE WERE LESS THAN SIGNIFICANT IMPACTS FOR THE AREAS SHOWN. PM10, PM2.5 AND SOX IN AIR QUALITY CONCENTRATIONS ALL ACCEPT PM10 AT A NOX HANDLE TWO. THE NON-CANCER HEALTH EFFECTS AND CANCER BURDEN AS WELL AS GROUND TRANSPORTATION AT ALL STUDY LOCATIONS ACCEPT ALAMEDA AND ANAHEIM AS MEASURED.

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WE ALSO IDENTIFIED CUMMULATIVE IMPACTS THAT WERE SIGNIFICANT AND UNVOIDABLE FOR AIR QUALITY AND HEALTH RISK, GREENHOUSE GASSES, GROUND TRANSPORTATION AT ALAMEDA AND ANAHEIM, AND LESS THAN SIGNIFICANT AFTERNOON MITIGATION AT JOHN S. GIBSON AT I-110 NORTHBOUND RAMPS.

SO THESE ARE THE NEW -- SOME NEW MITIGATION MEASURES. AS PART OF THE ANALYSIS, WE FOUND AN OPPORTUNITY TO ADD THREE NEW MEASURES AND MITIGATION MEASURES AND FOUR NEW LEASE MEASURES. WE REVISED SOME OF THEM TO ALIGN WITH THE 2017 CAP. THE ONE THAT I WANT TO DRAW YOUR ATTENTION TO IN PARTICULAR, AQ1, LEASE MEASURE AQ1, IS ONE WHERE WE REQUIRE AVAILABLE CARGO HANDLING EQUIPMENT AT THE TIME OF REPLACEMENT TO THE TERMINAL HAS TO COME TO THE HARBOR DEPARTMENT FIRST TO ASSURE THAT IT'S THE CLEANEST AVAILABLE, FOR THE FIRST PREFERENCE FOR ZERO EMISSIONS, SECOND PREFERENCE FOR NEAR-ZERO EMISSIONS, AND ONLY THEN, IF THOSE TWO ARE NOT AVAILABLE, FOR THE CLEANEST AVAILABLE.

THERE WILL BE AN MMRP, A MITIGATION MONITORING AND REPORTING PLAN, WHICH WILL REQUIRE DETAILED TRACKING AND MONITORING OF ALL MEASURES AS REQUIRED BY CEQA. AND THIS WILL BE -- PART OF THIS WILL BE DOCUMENTED IN COMPLIANCE STATUS REPORTS POSTED ONLINE. AND THIS MMRP WILL BE INCLUDED IN THE FINAL SUPPLEMENTAL EIR.

AS I MENTIONED, IF YOU HAVE COMMENTS, PLEASE FILL OUT A COMMENT CARD, AND JUST COMPLETE IT AND RETURN IT, AND

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I'LL CALL OFF YOUR NAME. IF YOU WANT TO SEND YOUR COMMENTS TO ME BY E-MAIL, JUST SEND IT MY CEQA COMMENTS. THAT'S THE E-MAIL ADDRESS. YOU CAN SEE IT THERE ON THE BOARD. OR YOU CAN BY MAIL, SUBMIT YOUR COMMENT CARD OR LETTER BY MAIL TO THE ADDRESS ON THE NEXT SLIDE.

THE REVIEW PERIOD STARTED ON NOVEMBER OR -- EXCUSE ME -- SEPTEMBER 28. COMMENTS WILL BE RECEIVED THROUGH NOVEMBER 16. PLEASE NOTE THAT BECAUSE THE ENTIRE DOCUMENT HAS BEEN RECIRCULATED, NEW COMMENTS MUST BE SUBMITTED AND PRIOR COMMENTS RECEIVED ON THE 2017 -- THE JUNE 2017 DRAFT SUPPLEMENTAL MAY NO LONGER BE PERTINENT, BUT WILL BE PART OF THE RECORD. THERE WILL BE OTHER OPPORTUNITIES TO PARTICIPATE AND COMMENT ON THE MERITS OF THE PROPOSED CHANGES, AND THE SEIR, ITSELF, BEFORE THE BOARDS MAKE ANY DECISIONS ON THESE REVISION MEASURES.

WITH THAT, AS I SAID, WE'LL TAKE ORAL COMMENTS TO (INAUDIBLE). PLEASE FILL OUT A SPEAKER CARD, AND I'LL TAKE THEM IN THE ORDER THEY ARE RECEIVED. EACH COMMENTER WILL BE GIVEN TWO MINUTES TO SPEAK, AND ALL COMMENTS ARE BEING TRANSCRIBED BY A COURT REPORTER, WHO IS HERE. PLEASE SPEAK SLOWLY AND CLEARLY SO THAT THE COURT REPORTER WILL BE ABLE TO FOLLOW AND ACCURATELY INDICATE WHAT YOUR COMMENTS ARE. AND AS I SAID, SPANISH TRANSLATION IS AVAILABLE.

WE JUST HAVE ONE SPEAKER CARD. IT'S JESSE MARQUEZ. JESSE? JESSE, WE ALL KNOW YOU. JUST STATE YOUR NAME AND WHO

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YOU ARE REPRESENTING FOR THE REPORTER.

MR. MARQUEZ: JESSE MARQUEZ, 65-YEAR RESIDENT OF WILMINGTON, CALIFORNIA, AND IT'S COALITION FOR A SAFE ENVIRONMENT.

THERE'S A COUPLE OF THINGS WE'D LIKE TO HAVE CLARIFICATION BECAUSE IT'S STILL CALLED THE CHINA SHIPPING. AND SO IS THIS A CONTRACT WITH THE CHINA SHIPPING COMPANY, OR IS THAT JUST THE TILE OF THE TERMINAL AND WHOEVER OPERATES IT UNDER THAT? THAT IS ONE THING THAT WE NEED TO HAVE CLARIFIED. PH-1

YOU ALSO TALK ABOUT -- THERE'S A STATEMENT IN THERE WHERE YOU MENTION "CLEANEST AT TIME OF REPLACEMENT." WELL, SOME PIECES OF EQUIPMENT COULD LAST, YOU KNOW, 10, 20 30, 40, YOU KNOW, YEARS, AND IT'S THEIR DISCRETION AS TO WHEN THEY MIGHT WANT TO RELACE IT. AND SO IS THERE GOING TO BE AN IMPLEMENTATION SCHEDULE WHERE THERE'S PHASE-IN AUTOMATICALLY THAT THEY HAVE TO REACH A CERTAIN GOAL OF 10 PERCENT, 20 PERCENT, OR 30 PERCENT OVER A PERIOD OF TIME? THAT IS SOMETHING THAT WE WOULD LIKE TO SEE. PH-2

AND THEN WE'D ALSO LIKE TO SEE THAT YOU INCLUDE, LIKE, A TECHNOLOGY CLEARING HOUSE. WHAT ARE THE AVAILABLE, SAY, VEHICLE AS WELL AS EQUIPMENT TECHNOLOGIES THAT ARE AVAILABLE THAT CAN OPERATE? OUR ORGANIZATION HAS BEEN PUBLISHING, SINCE THE CLEAN AIR ACTION PLAN, AN UPDATE, A MONTHLY UPDATE OF ZERO-EMISSION TECHNOLOGIES. AND IN THAT PH-3

PH-3

PH-4

PH-5

DOCUMENT IS LISTED BY EQUIPMENT AND VEHICLES SO IF YOU NEED TO LOOK UP A CLASS 8 DRAYAGE TRUCK, ON ROAD, OFF ROAD, IT HAS IT, CLASS 7, CLASS 6, CLASS 7, PANEL VANS, PICK-UP TRUCKS. WE EVEN FOUND BACKHOES ON IT. OKAY.

I DIDN'T SEE ANYTHING IN REGARDS TO ANY ENVIRONMENTAL JUSTICE UPDATES, SO WE WOULD LIKE TO SEE IF THERE IS ANYTHING IN THAT REGARD.

YOU HAD MENTIONED ALAMEDA CORRIDOR AS, YOU KNOW, SOME FREIGHT ROUTES. I'D LIKE TO BRING YOUR ATTENTION THAT, YOU KNOW, WE HAD IDENTIFIED IN PREVIOUS EIRs AS WELL AS IN THE HARBOR COMMUNITY BENEFIT FOUNDATION, A REPORT THAT THERE ARE OVER 100 CONTAINER STORAGE YARDS IN WILMINGTON, SO WE HAVE VARIOUS STREETS THAT HAVE NOW BECOME TRUCK ROUTES TO AND FROM THOSE CONTAINER STORAGE YARDS. AND THEY HAVE ALSO GROWN FROM JUST BEING CONTAINER STORM YARDS; SOME ACTUALLY ARE NOW CHASSIS STORAGE YARDS, YOUR TRUE GENSET STORAGE YARDS, AS WELL AS MAINTENANCE AND REPLACEMENT. AND SO WE'D LIKE TO SEE THOSE ADDRESSED AS WELL. THANK YOU.

MR. CANNON: THANK YOU.

SINCE THAT'S THE ONLY SPEAKER CARD THAT I HAVE, I WANT TO GIVE YOU AN OPPORTUNITY -- ANYBODY AN OPPOURTINITY TO SPEAK IF THEY HAVEN'T DONE SO OR WOULD LIKE TO FILL OUT A CARD.

OKAY. SEEING NONE, THEN I WILL CALL THE CHINA SHIPPING SUPPLEMENTAL EIR RECIRCULATED SUPPLEMENTAL EIR

HEARING TO A CLOSE. THANK YOU FOR COMING TODAY.

(HEARING CONCLUDES AT 6:15 P.M.)

REPORTER'S CERTIFICATE

I, OLIVIA D. LIZARRAGA, C.S.R. NO. 13475, A CERTIFIED SHORTHAND REPORTER FOR THE STATE OF CALIFORNIA, DO HEREBY CERTIFY:

THAT SAID PROCEEDING WAS TAKEN BEFORE ME AT THE TIME AND PLACE SET FORTH AND WAS TAKEN DOWN BY ME IN SHORTHAND AND THEREAFTER REDUCED TO COMPUTERIZED TRANSCRIPTION UNDER MY DIRECTION AND SUPERVISION; AND I HEREBY CERTIFY THE FOREGOING IS A FULL, TRUE AND CORRECT TRANSCRIPT OF MY SHORTHAND NOTES SO TAKEN.

I FURTHER CERTIFY THAT I AM NEITHER COUNSEL FOR NOR RELATED TO ANY PARTY TO SAID ACTION NOR IN ANY WAY INTERESTED IN THE OUTCOME THEREOF.

IN WITNESS WHEREOF, I HAVE HEREUNTO SUBSCRIBED MY NAME THIS 12TH DAY OF NOVEMBER, 2018.

OLIVIA D. LIZARRAGA
CERTIFIED SHORTHAND REPORTER NO. 13475

CERTIFIED COPY CERTIFICATE

I, OLIVIA LIZARRAGA, CERTIFIED SHORTHAND REPORTER, NO. 13475, HEREBY CERTIFY THAT THE ATTACHED IS A CORRECT AND CERTIFIED COPY OF THE PROCEEDING, TAKEN BEFORE ME AT THE TIME AND PLACE THEREIN STATED.

I DECLARE UNDER PENALTY OF PERJURY THAT THE FOREGOING IS TRUE AND CORRECT.

EXECUTED AT COVINA, CALIFORNIA THIS 12TH DAY OF NOVEMBER, 2018.

OLIVIA LIZARRAGA, C.S.R. NO 13475

Response to Comment PH-1

As described in Section 1.2.3.4 of the Recirculated DSEIR and Section 3.2.1 of the FSEIR, China Shipping North America Holding Co., Ltd (China Shipping) is the current leaseholder of the terminal at Berths 97-107 (the CS Terminal). West Basin Container Terminal Company (WBCT) operates the CS Terminal under contract with China Shipping or its parent company.

Response to Comment PH-2

The strategy for phasing newer equipment into the CS Terminal is described in the Recirculated DSEIR in mitigation measures MM AQ-15 and MM AQ-17 and in lease measure LM AQ-1. These measures ensure that in the near term the terminal transitions to equipment meeting either low-NO_X and EPA Tier 4 standards or, in the case of minor components, other standards such as zero emission or diesel-electric hybrids. The mitigation measures specify schedules for the transition based upon equipment model year.

Response to Comment PH-3

It is unclear what the comment means by "a technology clearing house". However, the Port has a Technology Advancement Program (described in the 2017 CAAP and at http://www.cleanairactionplan.org/technology-advancement-program/) that tracks developments in various technologies relevant to port operations, including zero-emissions terminal equipment, and promotes their further development and commercialization. In addition, lease measure LM AQ-1 commits the CS Terminal to frequent reviews of the feasibility of zero-emission cargo-handling equipment and to adopting those that are found to be feasible.

Response to Comment PH-4

Environmental Justice is not a CEQA issue; accordingly, the Recirculated DSEIR does not include a consideration of environmental justice.

Response to Comment PH-5

Please see Response to Comment CFASE-18.

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Chapter 3
Modifications to the Recirculated DSEIR

3.1 Introduction

This chapter addresses modifications to the Recirculated DSEIR for the Berths 97-106 (China Shipping) Container Terminal Revised Project. It presents all revisions related to public comments, as determined necessary by the LAHD as lead agency under CEQA, for the following areas of the document:

- Executive Summary
- Chapter 1 Introduction
- Chapter 2 Project Description
- Section 3.1 Air Quality
- Section 3.2 Greenhouse Gas Emissions and Climate Change
- Section 3.3 Ground Transportation
- Chapter 4 Cumulative Analysis

Any revisions to supporting documentation are also presented. The numbering format from the Recirculated DSEIR is maintained in the sections presented here. Only sections that were revised are included, and only the material from those sections that was revised, is presented here. Readers are referred to the Recirculated DSEIR to view complete sections.

As provided in Section 15088(c) of the State CEQA Guidelines, responses to comments may take the form of a revision to a draft EIR or may be a separate section of the final EIR. In this Final SEIR, responses to comments are presented in Chapter 2 and necessary revisions to the text are presented in this chapter.

Under CEQA, recirculation of all or part of an EIR may be required if significant new information is added after public review and prior to certification. According to CEQA Guidelines section 15088.5(a), new information is not considered significant "unless the EIR is changed in a way that deprives the public of a meaningful opportunity to comment upon a substantial adverse environmental effect of the project or a feasible way to mitigate or avoid such an effect (including a feasible project alternative) that the project's proponents have declined to implement." More specifically, the Guidelines define significant new information as including:

- A new significant environmental impact resulting from the project or from a new mitigation measure;
- A substantial increase in the severity of an environmental impact that would not be reduced to insignificance by adopted mitigation measures;

- A feasible project alternative or mitigation measure considerably different from those analyzed in a draft EIR that would clearly lessen the environmental impacts of the project and which the project proponents decline to adopt; and
- A Draft EIR that is so fundamentally and basically inadequate and conclusory that meaningful public review and comment were precluded.

The text changes described below update, refine, clarify, and amplify the project information and analyses presented in the Recirculated DSEIR. No new significant impacts are identified, and no information is provided that would involve a substantial increase in severity of a significant impact that would not be mitigated by measures already identified. In addition, no new or considerably different mitigation measures have been identified. Finally, there are no changes or set of changes that would reflect fundamental inadequacies in the Recirculated DSEIR. Recirculation of any part of the SEIR therefore is not required.

3.2 Changes to the Recirculated DSEIR

The following changes to the text as presented below are incorporated into the Final SEIR. Changes are provided in revision-mode text, wherein deletions of the original text are shown in ~~strikethrough~~ and additions to the Final SEIR are shown in underline. Page numbers refer to page numbers in the Recirculated DSEIR, so that the reader can easily locate where changes have been made. As a global change to the Recirculated DSEIR, the state clearinghouse number was corrected to 2003061153.

3.2.1 Changes Made to the Executive Summary

Section ES.1.1 Page ES-1

Revised tenant's name as follows:

Among the LAHD's tenants is China Shipping North America Holding Co., Ltd, which leases premises at Berths 97-109 to operate a marine container terminal (the "CS Container Terminal").

Table ES-1 starting on Page ES-9

Revised the statement of MM AQ-10, MM AQ-17, MM TRANS-2, and MM TRANS-3, and added labels to MM AQ-20 and LM AQ-23 as follows:

MM AQ-10 Vessel Speed Reduction Program	Starting in 2009, all ships calling at Berths 97-109 shall comply with the expanded VSRP of 12 knots between 40 nm .	Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area. ~~or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP.~~

		~~The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~
MM AQ-17 Yard Equipment at Berth 97-106 Terminal	All RTGs to be electric-powered by 2009 and all diesel-powered CHE at the Berth 97-109 terminal shall meet Tier 4 engine standards by the end of 2014.	All yard equipment at the terminal except yard tractors shall implement the following requirements: **Forklifts** • By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2004 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NO_x. • By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2005 and older shall be replaced with units that meet or ~~exceed~~ are lower than Tier 4 final off-road engine emission rates for PM and NO_x. • By two years after the effective date of a new lease amendment between the Tenant and the LAHD, all 5-ton forklifts of model years 2011 or older shall be replaced with zero-emission units. • By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all 18-ton diesel forklifts of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NO_x. **Top-picks** • By one year after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2006 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NO_x. • By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2007 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NO_x. • By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel top-picks of model years 2014 and older shall be replaced with units that meet or are lower than Tier 4 final off-road engine emission rates for PM and NO_x. **Rubber-Tired Gantry Cranes (RTGs)** • By three years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2003 and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine standards for PM and NO_x. • By five years after the effective date of a new lease amendment between the Tenant and the LAHD, all diesel RTG cranes of model years 2004

		and older shall be replaced with diesel-electric hybrid units with diesel engines that meet or are lower than Tier 4 final off-road engine standards for PM and NO_x. • By seven years after the effective date of a new lease amendment between the Tenant and the LAHD, four RTG cranes of model years 2005 and older shall be replaced with all-electric units, and one diesel RTG crane of model year 2005 shall be replaced with a diesel-electric hybrid unit with a diesel engine that meets or is lower than Tier 4 final off-road engine standards for PM and NO_x. **Sweepers** • Sweeper(s) shall be alternative fuel or the cleanest available by six years after the effective date of a new lease amendment between the Tenant and the LAHD. **Shuttle Buses** Gasoline shuttle buses shall be zero emissions by seven years after the effective date of a new lease amendment between the Tenant and the LAHD.
MM AQ-20 LNG Trucks	Heavy-duty trucks entering the Berth 97-109 Terminal shall be LNG fueled in the following percentages: 50% in 2012 and 2013, 70% 2014 through 2017, 100% in 2018 and thereafter.	Not included in the Revised Project because there is no feasible substitute or replacement measure for requiring a terminal specific drayage truck fleet.
LM AQ-23 Throughput Tracking	If the Project exceeds project throughput assumptions/projections anticipated through the years 2010, 2015, 2030, or 2045, staff shall evaluate the effects of this on the emissions sources (ship calls, locomotive activity, backland development, and truck calls) relative to the EIS/EIR. If it is determined that these emission sources exceed EIS/EIR assumptions, staff would evaluate actual air emissions for comparison with the EIS/EIR and if the criteria pollutant emissions	MM AQ-23 is not included in the Revised Project. Periodic reviews of throughput are unnecessary. Lease Measure AQ-1, below, would ensure a regular check-in process and evaluation of the cleanest available technology when equipment is purchased or replaced by the tenant.
MM TRANS-2 Alameda and Anaheim Streets	Provide an additional eastbound through-lane on Anaheim Street. This measure shall be	Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with~~

	implemented by 2015.	~~design/construction commencing in the first quarter of 2019,~~ subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.
MM TRANS-3 John S. Gibson Boulevard and I-110 NB Ramps	Provide an additional southbound and westbound right-turn lane on John S. Gibson Boulevard and I-110 NB ramps. Reconfigure the eastbound approach to one eastbound through-left-turn lane, and one eastbound through-right-turn lane. Provide an additional westbound right-turn lane with westbound right-turn overlap phasing. This measure shall be implemented by 2015.	Provide an additional westbound right-turn lane with westbound right-turn overlap phasing and an additional southbound left-turn lane. LAHD shall monitor the intersection LOS annually beginning in 2019, and shall implement the mitigation within three years after the intersection LOS is measured as D or worse and the China Shipping terminal is found to contribute to the cumulative impact, with the concurrence of LADOT.

Section ES.4 Page ES-15

Based on the Initial Study in the NOP, the following issues have been determined to be potentially significant and are therefore evaluated in this Recirculated Draft SEIR:

- Air Quality and Meteorology
- Greenhouse Gas Emissions and Climate Change
- Ground Transportation

Section ES.3.2.1 Page ES-17

Revised the text of LM AQ-3 as follows:

LM AQ-3: Demonstration of Zero Emissions Equipment:~~.~~ Tenant shall conduct a one-year zero emission demonstration project with at least ten units of zero-emission cargo handling equipment. Upon completion of the one-year demonstration, Tenant shall submit a report to LAHD that evaluates the feasibility of permanent use of the tested equipment. Tenant shall continue to test the zero-emission equipment and provide feasibility assessments and progress reports in 2020 and 2025 to evaluate the status of zero-emission ~~equipment~~ technologies and infrastructure as well as operational and financial considerations, with a goal of 100% zero-emission cargo handling equipment by 2030.

Section ES.3.2.1 Page ES-20

Revised the text of MM TRANS-2 as follows:

MM TRANS-2 Alameda & Anaheim Streets: Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with~~

~~design/construction commencing in the first quarter of 2019,~~ subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.

Table ES-2 starting on Page ES-24

Revised the table as follows:

Table ES-2: Summary of Potential Significant Impacts and Revised Project Mitigation

Environmental Impacts	Impact Determination	Mitigation Measures	Impacts after Mitigation
3.1 Air Quality and Meteorology			
AQ-3: Would the Revised Project would result in operational emissions that exceed an SCAQMD threshold of significance in Table 3.1-6?	Significant for CO in 2012 to 2023, VOC in 2014 to 2045, and NOx in 2014 to 2036. ~~Impacts of CO, NO_X, and PM_{10} emissions would be significant in multiple analysis years.~~	**Revised:** **MM AQ-9: AMP** **MM AQ-10: VSRP** **MM AQ-15: Yard Tractors** **MM AQ-17: Cargo-Handling Equipment** **New:** **LM AQ-1: Cleanest Available Cargo Handling Equipment** **LM AQ-2: Priority Access for Drayage** **LM AQ-3: Demonstration of Zero Emissions Equipment**	Significant and unavoidable
AQ-4: Would Revised project operations result in off-site ambient air pollutant concentrations that exceeds a SCAQMD threshold of significance in Table 3.1-10?	Significant for NO_2 in 2014 and 2018 and PM_{10} in 2014 through 2045. ~~The impacts of NO_2 and PM_{10} emissions (24-hour and annual average) would be significant in multiple analysis years.~~		Significant and unavoidable.
AQ-7: Would the Revised Project expose receptors to significant levels of TACs?	Significant for residential, occupational, and sensitive individual cancer risk. ~~Operations would result in significant cancer risk impacts for residential, occupational, and sensitive receptors.~~		Significant and unavoidable.
AQ-8: Would the Revised Project conflict with or obstruct implementation of an applicable AQMP?	Less than significant	No mitigation is required.	Less than significant.
3.2 Greenhouse Gase Emissions and Climate Change			
GHG-1: Would the Revised Project generate GHG emissions, either directly or indirectly that would exceed the SCAQMD 10,000 mty CO2e threshold?	Significant in 2012 through 2045	**New:** **MM GHG-1: LED Lighting.** **LM GHG-1: GHG Credit Fund**	Significant and unavoidable.

Table ES-2: Summary of Potential Significant Impacts and Revised Project Mitigation

Environmental Impacts	Impact Determination	Mitigation Measures	Impacts after Mitigation
3.3 Ground Transportation			
TRANS – 2: Would vehicular traffic associated with the Revised Project increase an intersection's V/C ratio in accordance with applicable guidelines?	The Revised Project would have a significant impact on the intersection of Alameda and Anaheim Streets.	**Revised:** **MM TRANS-2: Alameda & Anaheim Streets.**	Significant and unavoidable.
	The Revised Project would make cumulatively considerable contributions to significant cumulative impacts at the Alameda and Anaheim intersection and at the John S. Gibson/I-110 N/B Ramps intersection.	**Revised:** **MM TRANS-2: Alameda and Anaheim Streets.** **MM TRANS-3: John S. Gibson Boulevard and I-110 N/B Ramps.**	Significant and unavoidable at Alameda and Anaheim Streets. Less than significant at John S. Gibson/I-110 N/B Ramps.
TRANS – 4: Would the Revised Project result in an increase of 0.02 or more in the D/C ratio with a resulting LOS F at a CMP freeway monitoring station?	Less than significant	No mitigation is required.	Less than significant.
TRANS –5: Would the Revised Project cause delays in regional highway traffic due to an increase in rail activity?	Less than significant	No mitigation is required.	Less than significant.

3.2.2 Changes Made to Chapter 1 Introduction

Section 1.1.1 Page 1-1

Revised tenant's name as follows:

Among the LAHD's tenants is China Shipping North America Holding Co., Ltd, which leases premises at Berths 97-109 to operate a marine container terminal (the "CS Container Terminal").

Section 1.1.3 Page 1-2

Modified citation as follows:

Those impacts are identified in two documents: an Environmental Impact Statement/Environmental Impact Report (EIS/EIR) prepared by US Army Corps of Engineers (USACE) and the Los Angeles Harbor Department (LAHD) to examine the impacts of construction and operation of the terminal (~~USACE and LAHD~~ LAHD and USACE, 2008), and this Recirculated Draft SEIR.

Section 1.2.2 Page 1-7

Modified citation as follows:

The CS Container Terminal was constructed in several phases between 2004 and 2013, and began operation in 2005. It consists of two berths, ten wharf cranes for ship loading, and a container yard and gate complex. The terminal has access to an on-dock intermodal railyard at the adjacent Yang Ming Terminal (for a fuller description of the existing terminal see Section 2.5.1 and ~~USACE and LAHD~~ LAHD and USACE [2008]). The Revised Project does not include any physical alterations to the existing terminal, but instead consists of altered operating conditions from those examined in the 2008 EIS/EIR (~~USACE and LAHD~~ LAHD and USACE, 2008). The Revised Project would operate until 2045, the remaining term under LAHD Permit No. 999.

Section 1.9.7 Page 1-40

Modified citation as follows:

This Recirculated Draft SEIR incorporates the 2008 EIS/EIR for the Approved Project (~~USACE and LAHD~~ LAHD and USACE, 2008) by reference. The key findings of the 2008 EIS/EIR and its relationship to this document are summarized in Section 2.2 of this Recirculated Draft SEIR.

3.2.3 Changes Made to Chapter 2 Project Description

Section 2.2.3 Page 2-4

Revised Table 2-1 as follows:

MM AQ-15 Yard Tractors at Berth 97-109 Terminal	All yard tractors operated at the Berth 97-109 terminal shall run on alternative fuel (LPG) beginning September 30, 2004, until December 31, 2014 Beginning January 1 2015, all yard tractors operated at the Berths 97-109 terminal shall be the cleanest available NO_X alternative-fueled engine meeting 0.015 gm/hp-hr for PM (Tier 4 Final).	From 2004~~2008~~ through 2014, all yard tractors met requirement to run on LPG. As of December 31, 2017 all yard tractors are alternative-fueled LPG but they do not meet Tier 4 Final standard requirements.

Section 2.2.3 Page 2-7

Revised the statement of MM AQ-10 as follows:

MM AQ-10 is modified to require that starting on the effective date of a new lease amendment between the ~~t~~Tenant and the LAHD and annually thereafter, at least 95 percent of the vessels calling the CS Container Terminal shall comply with ~~either~~ the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area~~or an alternative compliance plan approved by the LAHD.~~

Section 2.5.2.1 Page 2-17

Revised the statement of MM AQ-10 as follows:

Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area~~ or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~

Section 2.5.2.1 Page 2-18

Revised the statement of MM AQ-15 as follows:

For the Revised Project, MM AQ-15 requires that:

- No later than one year after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2007 or older shall be <u>replaced with</u> alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants.
- No later than five years after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2011 or older shall be <u>replaced with</u> alternative fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road engine emission rates for other criteria pollutants.

Section 2.5.2.1 Page 2-20

In the first paragraph, revised the citation as follows:

The replacement schedule for CHE incorporated the useful economic service life of the existing equipment and the high capital costs (e.g., $650,000 per unit for toppicks; LAHD 201<u>6</u>~~4~~) but accelerated the replacement.

Section 2.5.2.1 Page 2-22

Added to the end of the paragraph at the top of the page:

equipment, emphasizing zero- and near-zero-emissions equipment. For the Revised Project, LM AQ-1 (see Section 2.5.2.2) requires the CS Terminal to participate in the CAAP's equipment procurement process. <u>In addition, the original MM AQ-17's requirement for an electric yard tractor demonstration has been replaced by a more comprehensive requirement in LM AQ-3 that the CS Terminal conduct a demonstration program with at least ten units of zero-emission cargo handling equipment.</u>

Section 2.5.2.2 Page 2-25

Revised the title of the section to:

Section 2.5.2.2 Revised Project New Lease Measures <u>and New Mitigation Measure</u>

Section 2.5.2.2 Page 2-26 and 2-27

Revised the statement of LM AQ-3 as follows:

Tenant shall conduct a one-year zero emission demonstration project with at least ten units of zero-emission cargo handling equipment. Upon completion, tenant shall submit a report to LAHD that evaluates the feasibility of permanent use of the tested equipment. Tenant shall continue to test the zero-emission equipment and provide feasibility assessments and progress reports in 2020 and 2025 to evaluate the status of zero-emission ~~equipment~~ technologies and infrastructure as well as operational and financial considerations, with a goal of 100% zero-emission cargo handling equipment by 2030.

Corrected the designation of LM GHG-2 to LM GHG-1 and revised the statement of the measure as follows:

LM GHG-~~2~~1: GHG Credit Fund

~~LAHD shall establish a carbon offset fund, which may be accomplished through a Memorandum of Understanding with the California Air Resources Board or another appropriate entity. The fund shall be used for GHG-reducing projects and programs on Port of Los Angeles property. It shall be the responsibility of the Tenant to contribute to the fund. Tenant shall have the option to either: (i) make a one-time fund contribution of $250,000, payable upon execution of a new lease amendment, or (ii) make a payment in 2030, at the time the peak impact would occur, in an amount calculated based on the market value of carbon credits at that time, and actual GHG emissions that exceed whatever GHG threshold exists at that time as approved by the LAHD. If LAHD is unable to establish the fund within a reasonable period of time, the Tenant shall instead purchase credits from an approved GHG offset registry.~~ LAHD shall establish a Greenhouse Gas Fund, which LAHD shall have the option to accomplish through a Memorandum of Understanding (MOU) with the California Air Resources Board (CARB) or another appropriate entity. The fund shall be used for GHG-reducing projects and programs approved by the Port of Los Angeles, or through the purchase of emission reduction credits from a CARB approved offset registry. It shall be the responsibility of the Tenant to make contributions to the fund in the amount of $250,000 per year, for a total of eight years, for the funding of GHG reducing projects or the purchase of GHG emission reduction credits, commencing after the date that the SEIR is conclusively determined to be valid, either by operation of Public Resources Code Section 21167.2 or by final judgment or final adjudication ("Conclusive Determination of Validity Date"), as described below. The fund contribution amount is established as follows: (i) the peak year of GHG operational emissions (2030), after application of mitigation, that exceed the established threshold for the Revised Project, estimated in the SEIR to be 129,336 metric tons CO2e, multiplied by (ii) the current (2019) market value of carbon credits established by CARB at $15.62 per metric ton CO2e. The payment for the first year shall be due within ninety (90) days of the Conclusive Determination of Validity Date, and the payment for each successive year shall be due on the anniversary of the Conclusive Determination of Validity Date. If LAHD is unable to establish the fund through an MOU with CARB within one year prior to when any year's payment is due, the Tenant shall instead apply that year's payment, using the same methodology described in parts (i) and (ii) above, to purchase emission reduction credits from a CARB approved GHG offset registry.

3.2.4 Changes Made to Chapter 3 Environmental Analysis

3.2.4.1 Changes Made to Section 3.1 Air Quality

Section Summary Page 3.1-1

Added text as follows:

Section 3.1, Air Quality and Meteorology, provides the following:

- a description of existing air quality and health effects in the Port area;
- a discussion on the methodology used to determine whether the Revised Project would result in a new or substantially more severe significant impact on air quality and health risk from air emissions;
- an impact analysis of the Revised Project;
- a description of mitigation measures proposed to reduce potential impacts, as applicable; and
- a comparison of those mitigation measures and residual impacts to the suite of original mitigation measures in the FEIR.

Section Summary Page 3.1-2

Revised text of MM AQ-10 as follows:

MM AQ-10: Vessel Speed Reduction Program (VSRP). Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin~~ and the Precautionary Area or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~

MM AQ-15: Yard Tractors.

1) No later than one year after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2007 or older shall be replaced with alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants.

2) No later than five years after the effective date of a new lease amendment between the Tenant and the LAHD, all LPG yard tractors of model years 2011 or older shall be replaced with alternative fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road engine emission rates for other criteria pollutants.

Section 3.1.2.3 Page 3.1-9

Revised Table 3.1-2 as follows

Table 3.1-2: Adverse Effects Associated with Criteria Pollutants

Pollutant[d]	Adverse Effects
Ozone (O_3) [e]	(a) Short-term exposures: (1) Pulmonary function decrements and localized lung edema in humans and animals and (2) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (b) Long-term exposures: Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (c) Vegetation damage; (d) Property damage
Carbon Monoxide (CO)	(a) Aggravation of angina pectoris and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses
Nitrogen Dioxide (NO_2) [f]	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration
Sulfur Dioxide (SO_2)	(a) Broncho-constriction accompanied by symptoms that may include wheezing, shortness of breath, and chest tightness during exercise or physical activity in persons with asthma
Suspended Particulate Matter less than 10 Microns (PM_{10}) [f]	(a) Excess deaths from short-term and long-term exposures; (b) excess seasonal declines in pulmonary function, especially in children; (c) asthma exacerbation and possibly induction; (d) adverse birth outcomes including low birth weight; (e) increased infant mortality; (f) increased respiratory symptoms in children such as cough and bronchitis; and (g) increased hospitalization for both cardiovascular and respiratory disease (including asthma) [a]
Suspended Particulate Matter less than 2.5 microns ($PM_{2.5}$)	(a) Excess deaths from short-term and long-term exposures; (b) excess seasonal declines in pulmonary function, especially in children; (c) asthma exacerbation and possibly induction; (d) adverse birth outcomes including low birth weight; (e) increased infant mortality; (f) increased respiratory symptoms in children such as cough and bronchitis; and (g) increased hospitalization for both cardiovascular and respiratory disease (including asthma)[a]
Lead [b]	(a) Increased body burden; (b) impairment of blood formation and nerve conduction, and neurotoxin.
Sulfates [c]	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardiopulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage

Source: (SCAQMD, 2007).

Notes:

[a] More detailed discussions on the health effects associated with exposure to suspended particulate matter can be found in the following documents: Office of Environmental Health Hazard Assessment's, Particulate Matter Health Effects and Standard Recommendations (OEHHA, 2002), and EPA's Air Quality Criteria for Particulate Matter, October 2004 (EPA, 2004a).

[b] Lead is not a pollutant of concern for the Revised Project.

[c] Sulfate is not a pollutant of concern for the Revised Project. SCAQMD has not established an emissions threshold for sulfates, nor does it require dispersion modeling against the localized significance thresholds.

[d] CAAQS have also been established for hydrogen sulfide, vinyl chloride, and visibility reducing particles. They are not shown in this table because they are not pollutants of concern for the Revised Project.

[e] A more detailed discussion of the adverse health effects associated with exposure to ozone is in Impact AQ-3 under "Links to Regional Health Effects".

[f] More detailed discussions of the adverse health effects associated with exposure to NO_2 and PM_{10} are in Impact AQ-4 under "Links to Local Health Effects".

Section 3.1.2.3 Page 3.1-10

Revised text as follows:

CARB currently designates the SCAB as a nonattainment area for ozone, PM_{10}, $PM_{2.5}$, ~~NO_2,~~ and lead. The air basin is in attainment of the CAAQS for CO, NO_2, SO_2, and sulfates, and is unclassified for hydrogen sulfide and visibility reducing particles (CARB, 2013).

Section 3.1.4.1 Page 3.1-29

Bulleted text was added:

The following types of impacts were analyzed:

- Air pollutant emissions of CO, VOC, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ within the SCAB were estimated for operation of the Revised Project. To determine their significance, the Revised Project emissions minus the 2008 Actual Baseline (see Section 3.1.4.2) emissions were compared to Significance Criterion AQ-3 identified in Section 3.1.4.4. The criteria pollutant emission calculations and assumptions are presented in Appendix B1.
- Dispersion modeling of CO, NO_x, SO_x, PM_{10}, and $PM_{2.5}$ emissions was performed to estimate maximum offsite air pollutant concentrations from emission sources attributed to the Revised Project. The predicted ambient concentrations associated with operation of the Revised Project were compared to Significance Criterion AQ-4. A summary of the dispersion modeling methodology is presented in this section, while the complete dispersion modeling report is presented in Appendix B2.
- Assessments of the potential health effects of criteria pollutant emissions on both regional and local scales are presented for each pollutant that has a significant impact on the environment. The approach and methodology used in the assessments are presented in Section 3.1.4.5.

Section 3.1.4.1 Page 3.1-38

Revised citation as follows

The SCAQMD's localized significance threshold for a 24-hour $PM_{2.5}$ concentration is 2.5 $\mu g/m^3$ for operational impacts ~~(SCAQMD, 2011b)~~(SCAQMD, 2019a).

Section 3.1.4.3 Pages 3.1-43 to 3.1-45

Revised citation in p.43 as follows

The *L.A. CEQA Thresholds Guide* incorporates, by reference, the CEQA Air Quality Handbook and associated significance thresholds developed by the SCAQMD (SCAQMD, 1993; ~~SCAQMD, 2011b~~SCAQMD, 2019a).

Revised citation in Table 3.1-7 as follows

Source:
~~SCAQMD, 2015.~~ SCAQMD, 2019a

Revised citation in Table 3.1-8 as follows

Sources:
~~SCAQMD, 2015.~~ SCAQMD, 2019a; EPA, 2013

Section 3.1.4.4 Page 3.1-46

Revised statement of impact threshold as follows:

Impact AQ-3: Would the Revised Project result in operational emissions that exceed an SCAQMD threshold of significance in Table 3.1-~~6~~7?

Revised statement of MM AQ-10 as follows:

MM AQ-10: **Vessel Speed Reduction Program (VSRP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area~~ or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~

Section 3.1.4.4 Page 3.1-49

Added text before Table 3.1-9 as follows:

Emissions for ocean going vessels in Table 3.1-9 have been updated in this Final SEIR for years 2023-2045, based on public comments, to facilitate informational comparison between the Revised Project and the FEIR Mitigated Scenarios of hotelling auxiliary engine emissions during the peak day. The Revised Project emissions shown in Table 3.1-9 have been modified in this Final SEIR to represent ships hotelling without shorepower (AMP) during the peak days of 2023-2045. Peak-day OGV emissions, and thus, total peak daily emissions, of the Revised Project as shown in the modified Table 3.1-9 are higher than those of the peak day of the FEIR Mitigated case (Table 3.1-10), which include reductions from AMP usage during hotelling. Peak day emissions for years 2012-2018 in the Revised Project reflect the actual compliance with 2008 EIR/EIS mitigations, hence, no updates to Table 3.1-9 were needed. Similarly, annual emissions in the Recirculated DSEIR for every analysis year of the Revised Project, summarized in Appendix B1, reflect the difference in AMP mitigation annual compliance and requirements between the Revised Project and the FEIR Mitigated Scenarios; thus, no updates were needed for annual emissions in this document. Despite the revisions to peak daily emissions of the Revised Project for 2023-2045, impact findings of significance have not changed between the Recirculated DSEIR and the Final SEIR, as shown in Table 3.1-10.

Section 3.1.4.4 Page 3.1-50

Table 3.1-9 revised as follows:

1 **Table 3.1-9. Peak Daily Operational Emissions—Revised Project (lbs/day)**

	Peak Day Emissions (lb/day)					
Source Category	**VOC**	**CO**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SOx**
2012 Actual						
Cargo Handling Equipment	113	1,781	641	17	16	0.6
Harbor Craft	3	16	27	1	1	0.0
Worker Vehicles Offsite	1	44	4	3	1	0.1
Trucks Offsite Driving	27	90	863	34	19	2.0
Ocean Going Vessels	69	125	1,006	31	29	155
Worker Vehicles Onsite Driving	0.1	1.7	0.1	0.3	0.1	0.0
Trucks Onsite Driving/Idling	0.8	5.4	0.6	0.3	0.1	0.0
Rail Offsite Operations	8	29	125	11	2	0.1
Rail On Dock Operations	5	22	96	3	3	0.1
Total	**253**	**2230**	**3310**	**119**	**88**	**158**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2012 Emissions Minus 2008 Actual Baseline	-6	680	-597	-99	-87	-998
Significance Threshold	55	550	55	150	55	150
Significant?	**No**	**Yes**	**No**	**No**	**No**	**No**
2014 Actual						
Cargo Handling Equipment	250	3,992	1,398	18	17	1.2
Harbor Craft	5	27	49	2	2	0.0
Worker Vehicles Offsite	1	35	3	3	1	0.1
Trucks Offsite Driving	45	128	1,778	58	24	4.5
Ocean Going Vessels	242	334	5,029	90	83	156
Worker Vehicles Onsite Driving	0.6	4.6	0.5	0.3	0.1	0.0
Trucks Onsite Driving/Idling	15	70	277	26	4	0.4
Rail Offsite Operations	24	125	553	16	15	0.5
Rail On Dock Operations	5	25	105	3	3	0.1
Total	**587**	**4740**	**9192**	**216**	**148**	**163**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2014 Emissions Minus 2008 Actual Baseline	328	3191	5284	-2	-26	-994
Significance Threshold	55	550	55	150	55	150
Significant?	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**
2018 Revised Project*						
Cargo Handling Equipment	287	3,792	1,127	14	14	1.0
Harbor Craft	2	47	20	0	0	0.1
Worker Vehicles Offsite	1	37	3	5	1	0.1
Trucks Offsite Driving	52	162	1,745	63	31	4.2
Ocean Going Vessels	301	155	4,239	49	46	112
Worker Vehicles Onsite Driving	0.8	7.0	0.6	0.6	0.1	0.0
Trucks Onsite Driving/Idling	16	76	275	25	5	0.3

	Peak Day Emissions (lb/day)					
Source Category	**VOC**	**CO**	**NOx**	**PM$_{10}$**	**PM$_{2.5}$**	**SOx**
Rail Offsite Operations	26	152	679	17	16	0.6
Rail On Dock Operations	4	24	98	2	2	0.1
Total	**689**	**4451**	**8186**	**177**	**115**	**118**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2018 Emissions Minus 2008 Actual Baseline	430	2902	4278	-40	-59	-1038
Significance Threshold	55	550	55	150	55	150
Significant?	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**
2023 Revised Project						
Cargo Handling Equipment	306	2,409	478	11	11	1.3
Harbor Craft	2	50	20	0	0	0.1
Worker Vehicles Offsite	0	28	2	6	1	0.1
Trucks Offsite Driving	12	55	892	57	21	4.7
Ocean Going Vessels	221~~193~~	412~~340~~	6,366~~5,623~~	93~~76~~	86~~71~~	195~~165~~
Worker Vehicles Onsite Driving	0.6	6.8	0.5	0.7	0.1	0.0
Trucks Onsite Driving/Idling	11	148	183	30	5	0.4
Rail Offsite Operations	28	220	789	18	17	0.9
Rail On Dock Operations	4	28	97	2	2	0.1
Total	**585~~557~~**	**3358~~3286~~**	**8827~~8084~~**	**218~~201~~**	**143~~127~~**	**203~~172~~**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2023 Emissions Minus 2008 Actual Baseline	326~~298~~	~~18081736~~	4920~~4177~~	1~~-16~~	-31~~-47~~	-954~~-984~~
Significance Threshold	55	550	55	150	55	150
Significant?	**Yes**	**Yes**	**Yes**	**No**	**No**	**No**
2030 Revised Project						
Cargo Handling Equipment	51	654	56	3	3	1.4
Harbor Craft	3	53	21	1	0	0.1
Worker Vehicles Offsite	0	23	1	6	2	0.1
Trucks Offsite Driving	8	59	780	62	22	4.3
Ocean Going Vessels	403~~372~~	797~~716~~	5,294~~4,594~~	134~~115~~	124~~106~~	204~~170~~
Worker Vehicles Onsite Driving	0.4	5.8	0.4	0.8	0.1	0.0
Trucks Onsite Driving/Idling	11	165	207	34	5	0.4
Rail Offsite Operations	20	233	581	12	11	0.9
Rail On Dock Operations	3	28	69	1	1	0.1
Total	**499~~468~~**	**2018~~1937~~**	**7010~~6310~~**	**253~~234~~**	**169~~151~~**	**211~~177~~**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2030 Emissions Minus 2008 Actual Baseline	240~~209~~	469~~388~~	3103~~2403~~	35~~16~~	-6~~-23~~	-945~~-979~~
Significance Threshold	55	550	55	150	55	150
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**
2036 Revised Project						
Cargo Handling Equipment	69	687	61	3	3	1.4

	Peak Day Emissions (lb/day)					
Source Category	**VOC**	**CO**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SOx**
Harbor Craft	3	56	22	1	1	0.1
Worker Vehicles Offsite	0	21	1	6	1	0.1
Trucks Offsite Driving	6	60	720	63	22	3.7
Ocean Going Vessels	403~~372~~	797~~716~~	3,425~~2,992~~	134~~115~~	124~~106~~	204~~170~~
Worker Vehicles Onsite Driving	0.2	5.2	0.4	0.7	0.1	0.0
Trucks Onsite Driving/Idling	11	165	209	34	5	0.3
Rail Offsite Operations	13	222	379	7	7	0.9
Rail On Dock Operations	2	27	48	1	1	0.1
Total	**508~~477~~**	**2041~~1960~~**	**4865~~4432~~**	**249~~230~~**	**164~~146~~**	**211~~177~~**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2036 Emissions Minus 2008 Actual Baseline	249~~218~~	491~~410~~	958~~525~~	31~~12~~	-11~~-28~~	-946~~-980~~
Significance Threshold	55	550	55	150	55	150
Significant?	**Yes**	**No**	**Yes**	**No**	**No**	**No**
2045 Revised Project						
Cargo Handling Equipment	55	662	57	3	3	1.4
Harbor Craft	2	50	20	0	0	0.1
Worker Vehicles Offsite	0	21	1	6	2	0.1
Trucks Offsite Driving	6	68	790	61	21	3.2
Ocean Going Vessels	403~~372~~	797~~716~~	1,480~~1,288~~	134~~115~~	124~~106~~	204~~170~~
Worker Vehicles Onsite Driving	0.2	4.8	0.4	0.8	0.1	0.0
Trucks Onsite Driving/Idling	11	165	209	34	5	0.3
Rail Offsite Operations	8	206	209	3	3	0.8
Rail On Dock Operations	1	27	31	0	0	0.1
Total	**487~~455~~**	**2001~~1920~~**	**2797~~2606~~**	**243~~224~~**	**158~~141~~**	**210~~176~~**
2008 Actual Baseline	259	1,549	3,907	218	174	1,156
Total 2045 Emissions Minus 2008 Actual Baseline	227~~196~~	452~~371~~	-1110~~-1301~~	25~~6~~	-16~~-34~~	-946~~-980~~
Significance Threshold	55	550	55	150	55	150
Significant?	**Yes**	**No**	**No**	**No**	**No**	**No**

Note:

*2018 analysis year is based on projected activity and does not qualify as "Actual". However, in this analysis Revised Project mitigations do not begin until 2019, therefore 2018 reflects compliance with 2008 EIR/EIS mitigations at the time.

Rail Offsite Operations considered for the peak day include emissions occurring only within SCAB boundaries

OGV emissions for peak day include operations up to SCAB Overwater Boundary

Emissions for ocean going vessels (OGV) have been updated for years 2023-2045 in the FSEIR to represent no AMP usage during the peak day for the Revised Project in those years. OGV emissions for 2012-2018 already reflected no AMP usage during Revised Project peak day.

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Due to revisions to peak daily OGV, text was added after Table 3.1-10 and Table 3.1-11 was revised, as follows:

Table 3.1-11 summarizes the peak daily emission impacts for each scenario in each analysis year. The absolute difference between Revised Project daily emissions and the FEIR Mitigated Scenario emissions are also shown. By that comparison, Table 3.1-11 shows the incremental emissions that resulted from partial compliance with the 2008 EIR/EIS mitigation measures and from the difference in future mitigation requirements between the Revised Project and the FEIR Mitigated Scenario.

Table 3.1-11. Summary of Emission Impacts for Revised Project and FEIR Mitigated Scenario (informational only)

Pollutant	Year	Peak day emissions minus 2008 Actual Baseline (lbs/day)		Daily Threshold (lb/day)	Difference between scenarios
		Revised Project	FEIR Mitigated		
VOC	2012	-6	-37	55	31
	2014	328	299	55	29
	2018	430	174	55	256
	2023	326~~298~~	112	55	214~~187~~
	2030	240~~209~~	218	55	22~~-9~~
	2036	249~~218~~	270	55	-21~~-53~~
	2045	227~~196~~	273	55	-45~~-76~~
NOx	2012	-597	-1369	55	772
	2014	5284	4082	55	1203
	2018	4278	2918	55	1360
	2023	4920~~4177~~	3854	55	1066~~323~~
	2030	3103~~2403~~	2468	55	635~~-65~~
	2036	958~~525~~	602	55	356~~-77~~
	2045	-1110~~-1301~~	-1218	55	108~~-84~~
CO	2012	680	617	550	63
	2014	3191	3193	550	-3
	2018	2902	-652	550	3554
	2023	1808~~1736~~	-124	550	1932~~1860~~
	2030	469~~388~~	212	550	257~~176~~
	2036	491~~410~~	323	550	169~~88~~
	2045	452~~371~~	329	550	123~~42~~
PM_{10}	2012	-99	-119	150	20
	2014	-2	-22	150	20
	2018	-40	-59	150	19
	2023	1~~-16~~	-22	150	22~~5~~
	2030	35~~16~~	18	150	17~~-2~~
	2036	31~~12~~	15	150	16~~-3~~

Pollutant	Year	Peak day emissions minus 2008 Actual Baseline (lbs/day)		Daily Threshold	Difference between
	2045	25~~6~~	10	150	16~~-3~~
$PM_{2.5}$	2012	-87	-105	55	19
	2014	-26	-44	55	18
	2018	-59	-77	55	18
	2023	-31~~-47~~	-52	55	21~~5~~
	2030	-6~~-23~~	-22	55	16~~-1~~
	2036	-11~~-28~~	-26	55	15~~-3~~
	2045	-16~~-34~~	-31	55	15~~-3~~
SOx	2012	-998	-1071	150	73
	2014	-994	-1007	150	13
	2018	-1038	-1050	150	12
	2023	-954~~-984~~	-984	150	30~~0~~
	2030	-945~~-979~~	-979	150	34~~0~~
	2036	-946~~-980~~	-980	150	34~~0~~
	2045	-946~~-980~~	-980	150	34~~0~~

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Added text in Impact AQ-4 as follows:

Results in Tables 3.1-12 through 3.1-14 show that impacts of the Revised Project would exceed the significance thresholds for federal 1-hour NO_2 in 2014 and 2018, state 1-hour NO_2 in 2014, annual NO_2 in 2014 and 2018, 24-hour PM_{10} in 2014 through 2045, and annual PM_{10} in 2014 through 2045. Impacts of SO_2, CO, and $PM_{2.5}$ would be below the thresholds in all analysis years.

Updates related to fine grid dispersion modeling

Six fine-grid dispersion model runs that were not performed for the Recirculated DSEIR were modeled for the Final SEIR. As a result, several NO_2 concentrations have been revised to slightly higher values and their locations have moved slightly. The revised tables and figures are included in the Final SEIR. All of the concentrations to which revisions have been made would remain well below the significance thresholds. Therefore, this revision would not change any of the significance findings in the Recirculated DSEIR.

Updates related to Revised Project peak daily emissions

As described above, peak-day ship hotelling emissions in the years 2023 - 2045 increased relative to the emissions described in the Recirculated DSEIR. The effect of those increases on 24-hr, 8-hr, and 1-hr criteria pollutant concentrations was re-evaluated as follows:

- For 24-hr $PM_{2.5}$, the 2023 at-berth auxiliary engine hoteling emissions increased from 4.7 lb/day (modeled in the Recirculated DSEIR) to 20.4 lb/day (revised in the Final SEIR). Therefore, AERMOD was rerun for 2023 24-hr $PM_{2.5}$ to evaluate the effect of this source emissions increase in local ambient concentrations for $PM_{2.5}$. Revised modeling showed the 24-hour PM2.5

concentration increment for 2023 increased by 0.016 ug/m3 at the maximum receptor but remains unchanged in the table at 0.3 ug/m3 after rounding to the nearest 0.1 ug/m3. Therefore, no new impact would occur in 2023. Because the 2030-2045 $PM_{2.5}$ concentrations are even less than the 2023 concentration, no new impacts would occur for those analysis years either.

- The 24-hr PM_{10} concentrations were determined to be significant in the Recirculated SEIR, so an increase in PM_{10} emissions will not affect the significance findings. $PM_{2.5}$ results were used to estimate the percent increase in the PM_{10} concentrations. Due to the parallels between PM_{10} and $PM_{2.5}$, the LAHD expects that the revised PM_{10} concentrations would increase a similar amount as the $PM_{2.5}$ concentrations at the maximum receptor (i.e, small increase; see previous bullet). Therefore, the impact related to revised 24-hr PM_{10} concentrations would remain significant, but the increases would be relatively small.
- Because of the composite modeling approach for CO and SO_2 whereby maximum emissions from all analysis years were modeled for each source (see methodology in Appendix B2 for further details) and because the revised 8-hour CO and 24-hour SO_2 emissions are still less than what was modeled for the Recirculated DSEIR, therefore, the revision will have no effect on 8-hr CO or 24-hr SO_2. The maximum 8-hr CO and 24-hr SO_2 auxiliary engine emissions modeled for the Revised Project belonged to years 2014 and 2012, respectively, which have not been updated in this Final SEIR.
- None of the 1-hour emissions for the Revised Project have changed, as the Recirculated DSEIR had assumed the 1-hr peaks of 2023-2045 to be without shorepower, so no updates are needed for 1-hr NO_2, 1-hr SO_2, 1-hr CO concentrations, or the acute hazard index in AQ-7.

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Table 3.1-12 revised as follows:

Table 3.1-12. Maximum Off-Site Ambient NO_2 Concentrations – Revised Project

Pollutant	Averaging Period	Analysis Year	Background Concentration (ug/m^3)[c]	Maximum Modeled Project Concentration Increment (ug/m^3)[d,f]	Total Concentration (ug/m^3)[a,e]	Significance Threshold (ug/m^3)	Significant?
NO_2[b]	Federal 1-hour	2012	139	40.3	179	188	No
		2014	127	158.9	286	188	Yes
		2018	123	108.7	232	188	Yes
		2023	123	17.8~~15.6~~	141~~139~~	188	No
		2030	123	11.6	135	188	No
		2036	123	4.3	127	188	No
		2045	123	0.7~~< 0~~	124~~123~~	188	No
	State 1-hour	2012	185	44.4	229	339	No
		2014	173	169.6	343	339	Yes
		2018	164	119.2	283	339	No
		2023	164	19.9	184	339	No
		2030	164	13.0	177	339	No
		2036	164	5.1	169	339	No
		2045	164	2.1~~1.2~~	166~~165~~	339	No
	Annual	2012	40	11.6	52	57	No
		2014	34	31.7	66	57	Yes
		2018	32	25.2	57	57	Yes
		2023	32	8.7	41	57	No
		2030	32	1.6	34	57	No
		2036	32	0.6	33	57	No
		2045	32	0.7	33	57	No

[a] Exceedances of the thresholds are indicated in bold.
[b] The federal 1-hour NO_2 modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations. The state 1-hour NO_2 modeled concentration represents the maximum concentration.
[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[d] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
~~[f] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.~~

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Revised Table 3.1-15 as follows:

Table 3.1-15. Maximum Off-Site Ambient NO_2 Concentrations – FEIR Mitigated Scenario (informational only)

Pollutant	Averaging Period	Analysis Year	Background Concentration (ug/m^3)[c]	Maximum Modeled Project Concentration Increment (ug/m^3)[a,d,f]	Total Concentration (ug/m^3)[e]	Significance Threshold (ug/m^3)	Significant?
NO_2[b]	Federal 1-hour	2012	139	9.6	149	188	No
		2014	127	53.5	180	188	No
		2018	123	9.1	132	188	No
		2023	123	11.1	134	188	No
		2030	123	11.6	135	188	No
		2036	123	4.3	127	188	No
		2045	123	0.7~~< 0~~	124~~123~~	188	No
	State 1-hour	2012	185	16.9	202	339	No
		2014	173	61.7	235	339	No
		2018	164	10.8	175	339	No
		2023	164	14.6	179	339	No
		2030	164	13.0	177	339	No
		2036	164	5.1	169	339	No
		2045	164	2.1~~1.3~~	166~~165~~	339	No
	Annual	2012	40	5.2	45	57	No
		2014	34	16.7	51	57	No
		2018	32	7.0~~6.4~~	39~~38~~	57	No
		2023	32	3.3	35	57	No
		2030	32	2.8	35	57	No
		2036	32	1.9	34	57	No
		2045	32	1.8	34	57	No

[a] Exceedances of the thresholds are indicated in bold.
[b] The federal 1-hour NO_2 modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations. The state 1-hour NO_2 modeled concentration represents the maximum concentration.
[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[d] The Modeled Project Concentration Increment represents the modeled concentration of the ~~Project~~FEIR Mitigated Scenario minus the modeled concentration of the 2008 Actual Baseline.
[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
~~[f] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the Baseline concentration at every modeled receptor.~~

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Added text immediately before Table 3.1-18 as follows:

Updates related to Revised Project peak daily emissions

Peak daily emissions related to ship (i.e. OGVs) hotelling for years 2023-2045 of the Revised Project have increased in the Final SEIR, as detailed in the discussion of Impact AQ-3. However, annual and 1-hour ship hoteling emissions of 2023-2045 for the Revised Project have not changed, as the RDSEIR had assumed the 1-hr peaks of 2023-2045 to be without shorepower. Similarly, annual emissions in the RDSEIR for every analysis year of the Revised Project reflect the difference in AMP mitigation annual compliance and requirements between the Revised Project and FEIR Mitigated scenarios, with the result that no updates were needed for annual emissions in this document. Therefore, because the health risk analysis only uses annual and 1-hr emissions of PM and VOC to evaluate individual cancer risk, chronic hazard index and acute hazard index, the changes in peak daily emissions would not have an effect on Impact AQ-7.

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Added a new Section 3.1.4.5 after Table 3.1-22.

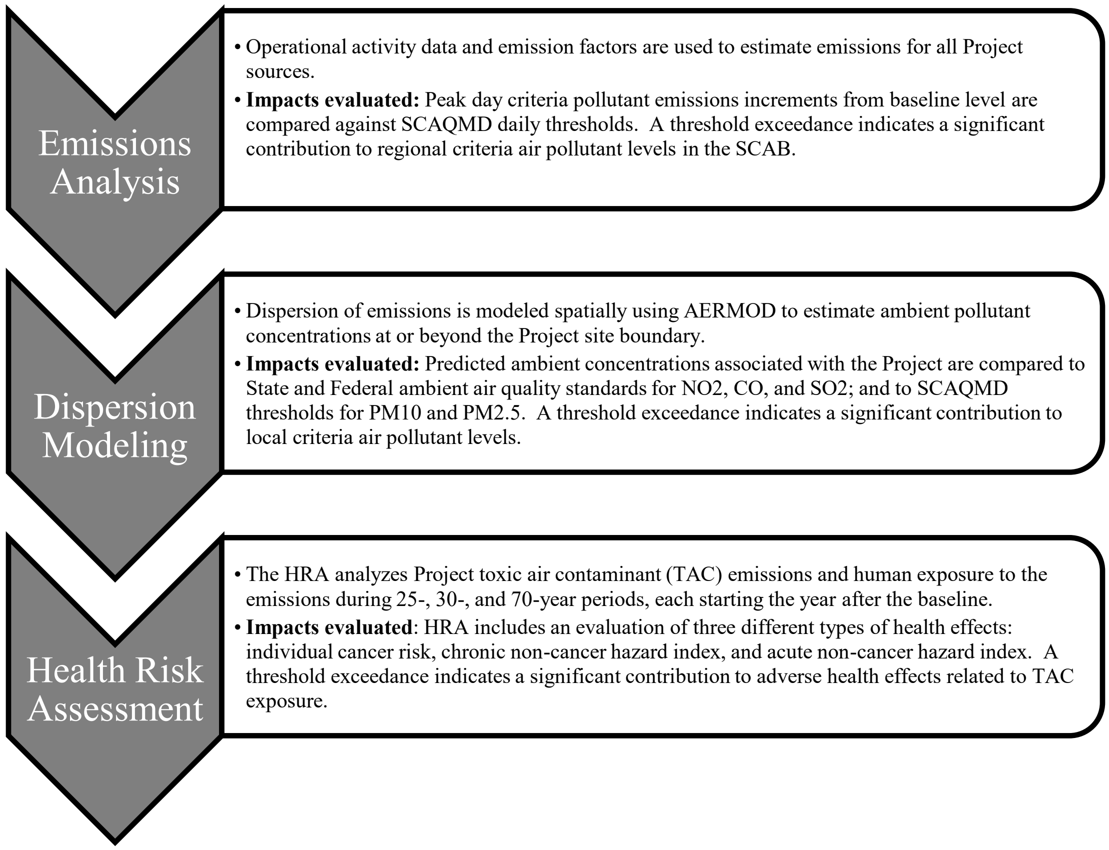
Section 3.1.4.5 Discussion of Health Effects Related to Criteria Pollutant Impacts

This section includes a discussion of the potential health effects of criteria air pollutant impacts in accordance with the findings of the legal case *Sierra Club v. County of Fresno* (2018), commonly called "Friant Ranch." Potential health effects are described for the Revised Project's significant emissions identified in Impact AQ-3 and significant ambient concentrations identified in Impact AQ-4. This discussion is not a new impact assessment but rather provides supplemental information related to the significant impacts already identified in the Recirculated DSEIR. The discussion links the Revised Project's impacts to potential health effects in response to the Friant Ranch court decision which was filed in between the time of the Recirculated DSEIR and Final SEIR. The information and graphics presented in this discussion that are related to the Revised Project's impacts were developed from the same data used to prepare the Recirculated DSEIR. Health effects information was acquired through a review of available literature published by the SCAQMD, CARB, and EPA.

The discussion of health effects is guided by the step-wise process depicted in Figure 3.1-3 that is used for assessing air quality impacts in the Recirculated DSEIR. The first step, emissions analysis, is presented in Impact AQ-3 and is indicative of *regional* air quality impacts because the analysis determines the quantity of pollutants released into the SCAB from Revised Project-related sources operating throughout the SCAB. The second step, dispersion modeling, is presented in Impact AQ-4 and is indicative of *local* impacts because the analysis estimates the ambient pollutant concentrations to which persons would be exposed, and the highest concentrations are predicted to occur in close proximity to the Project site. Therefore, the health effects discussion considered both regional health effects (i.e., effects that could be experienced throughout the SCAB) and local health effects (i.e., effects in the vicinity of the CS Terminal). The third step, health risk assessment (HRA), is presented in Impact AQ-7 of the Recirculated DSEIR. The results for individual cancer risk and population cancer burden in Tables 3.1-18 and 3.1-19 are already direct estimates of the health effects associated with exposure to the

Revised Project's toxic air contaminant (TAC) emissions. Therefore, no further health effects discussion is necessary for the HRA.

Figure 3.1-3. Air Quality Analysis Key Elements and Progression



Regional Health Effects

This section discusses the relationship between the Revised Project's regional criteria pollutant emissions and the potential for adverse health effects to occur for persons exposed to the emitted pollutants. The Revised Project would produce significant regional emissions of VOC in analysis years 2014 to 2045, CO in 2012 to 2023, and NO_x in 2014 to 2036. The primary component of NO_x is NO_2, a criteria pollutant. In addition, VOC and NO_x are precursors of ozone, a criteria pollutant that is photochemically formed from the precursors in the atmosphere in the presence of sunlight (EPA, 2018). Therefore, the criteria pollutants evaluated for regional health effects are CO, NO_2, and ozone.

There is currently no methodology available that can accurately quantify regional health effects from CO, NO_2, or ozone exposure associated with an individual project's VOC, CO, or NO_x emissions. The SCAQMD reached a similar conclusion in its *Amicus Curiae* brief filed with the California Supreme Court in the case of *Sierra Club v. County of Fresno*, when, speaking about ozone, the SCAQMD stated that it does not know of a way to accurately quantify health impacts caused by emissions produced on a scale as small as individual projects (SCAQMD, 2015b). One existing tool, EPA's BenMAP, calculates the number and economic value of air pollution-related deaths and illnesses resulting from changes in ozone and $PM_{2.5}$ concentrations (EPA, 2019). However, the expected changes in regional ozone concentrations associated with the Revised Project would be so low that BenMAP would likely produce estimates of health effects that are near zero. Therefore, the extent to which regional adverse health effects can be identified in this section is limited to (a) discussing the Revised Project's potential impact on regional pollutant levels; and (b) generally describing the types of adverse health effects associated with exposure to the pollutants of concern.

Carbon Monoxide (CO)

Impact on Regional CO Concentrations. The SCAB is currently designated attainment of the CAAQS and NAAQS for CO. The CAAQS were established to protect public health, including the most sensitive groups (CARB, 2019). The NAAQS were established to protect public health with an adequate margin of safety (U.S.C, 2013). The most stringent CAAQS or NAAQS (also referred to as state or federal standards) for CO are 20 ppm for a 1-hour average and 9.0 ppm for an 8-hour average.

The highest CO concentrations recorded anywhere in the SCAB over the last 3 available years (2015-2017) are 8.4 ppm for a 1-hour average and 4.6 ppm for an 8-hour average (SCAQMD, 2019b). These pollutant levels are 42 and 51 percent of the 1-hour and 8-hour standards, respectively.

According to the most recent EPA-approved SCAB emissions inventory, the total CO emissions within the SCAB in 2012 were 2,123 tons/day (SCAQMD, 2017b). By comparison, the highest CO emissions increment associated with the Revised Project was 3,191 lb/day (1.6 tons/day), which is 0.08 percent as large as the total SCAB emissions. Given that the current CO concentrations in the county are no greater than 51 percent of the CAAQS or NAAQS, it is very unlikely that a 0.08 percent emissions contribution from the Revised Project would lead to a violation of the CAAQS or NAAQS anywhere in the SCAB.

Potential Health Effects. In developing the CO standards, EPA (2010b) has prepared a comprehensive report on the possible health effects associated with CO exposure. EPA's findings are summarized by the SCAQMD in its *Final 2016 Air Quality Management Plan* (SCAQMD, 2017b). The main conclusions are:

- Individuals with a deficient blood supply to the heart are the most susceptible to the adverse effects of CO exposure. The effects observed include earlier onset of chest pain with exercise, and electrocardiograph changes indicative of worsening oxygen supply delivery to the heart. Inhaled CO has no known direct toxic effect on the lungs, but exerts its effect on tissues by interfering with oxygen transport, by competing with oxygen to combine with hemoglobin present in the blood to form carboxyhemoglobin (COHb). Hence, people with conditions requiring an increased oxygen supply can be adversely affected by exposure to CO. Individuals most at risk include patients with diseases involving heart and blood vessels, fetuses, and patients with chronic hypoxemia (oxygen deficiency), such as is seen at high altitudes. Reductions in birth weight and impaired neurobehavioral development have been observed in animals chronically exposed to CO resulting in COHb levels similar to those observed in smokers. Recent studies have found increased risks for adverse birth outcomes with exposure to elevated CO levels, including preterm births and heart abnormalities.

Nitrogen Dioxide (NO_2)

Impact on Regional NO_2 Concentrations. The SCAB is currently designated attainment of the NO_2 concentration standards. The most stringent state and federal NO_2 standards are 0.18 ppm for a 1-hour average (state 1-hour standard), 0.100 ppm for a three-year average of the 98th percentile of the annual distributions of daily maximum 1-hour average concenrations (federal 1-hour standard), and 0.030 ppm for an annual average.

The highest NO_2 concentrations recorded anywhere in the SCAB over the last 3 available years (2015-2017) are 0.1155 ppm for the state 1-hour average, 0.078 ppm for the federal 1-hour average, and 0.0356 ppm for an annual average (SCAQMD, 2019b). These pollutant levels are 64, 78, and 119 percent of the state 1-hour, federal 1-hour, and annual standards, respectively.

The exceedance of the state annual standard of 0.030 ppm occurred in all three years at a single monitoring station adjacent to Route 60 in Ontario. This station is one of four near-road sites in the SCAB purposely placed by the SCAQMD to capture impacts from heavily traveled roadways (SCAQMD, 2019c). In November 2018, CARB proposed to separate the area surrounding this monitor from the remainder of the SCAB and reclassify the area as nonattainment. CARB is currently working with the SCAQMD to define the specific boundary of the nonattainment area. The remainder of the SCAB will remain classified as attainment (CARB, 2018b).

According to the most recent EPA-approved SCAB emissions inventory, the total NO_x emissions within the SCAB in 2012 were 540 tons/day (SCAQMD, 2017b). By comparison, the highest NO_x emissions increment associated with the Revised Project was 5,284 lb/day (2.6 tons/day), which is 0.5 percent as large as the total SCAB emissions. Therefore, the Revised Project's contribution to regional NO_2 levels would be relatively small.

Potential Health Effects. In developing the NO_2 standards, the EPA (2016) and CARB (2007b) have prepared comprehensive reports on the possible health effects associated with NO_2 exposure. The main conclusions of these agencies are:

- EPA (2016) concluded that a causal relationship exists between short-term NO_2 exposure and respiratory effects such as asthma attacks. There is likely to be a causal relationship between long-term NO_2 exposure and respiratory effects based on the evidence for development of asthma. For short-term and/or long-term NO_2 exposure, evidence is suggestive of, but not sufficient to imply, a causal relationship with cardiovascular effects, diabetes, mortality, birth outcomes, and cancer. People with asthma, children, and older adults are at increased risk for NO_2-related health effects.
- CARB (2007b) concluded that, in controlled human exposure studies, asthmatics appear to be especially sensitive to NO_2. Asthmatic volunteers have experienced short-term effects at concentrations as low as 0.26 ppm. There is evidence that a subset of asthmatics may experience increased airway reactivity at concentrations of 0.2 to 0.3 ppm for 30 minutes to 2 hours. Generally, no clinical effects are reported in non-asthmatic volunteers in conditions below 1 ppm. Epidemiological studies have shown an association between NO_2 and both hospital admissions and emergency room visits for asthma at 24-hour average concentrations ranging from 0.018 to 0.036 ppm. Less robust evidence suggests associations with mortality, hospitalization for cardiovascular disease, and low birth weight.

Ozone

Impact on Regional Ozone Concentrations. The SCAB is currently designated nonattainment of the ozone concentration standards. The most stringent state and federal ozone standards are 0.09 ppm for a 1-hour average, 0.070 ppm for the three-year average of the fourth-highest 8-hour concentration each year (known as the federal 8-hour standard), and 0.07 ppm for an 8-hour average (known as the state 8-hour standard).

The highest 1-hour ozone concentration recorded in the SCAB over the last three available years (2015-2017) is 0.163 ppm, which is 1.8 times the standard. This concentration occurred in 2016 at the Crestline station in the central San Bernardino Mountains. The standard was exceeded somewhere in the SCAB on 24 percent of days during the three-year period.

The highest federal 8-hour ozone concentration recorded in the SCAB over the last three available years (2015-2017) is 0.112 ppm, which is 1.6 times the standard. This concentration also occurred at the Crestline station. The threshold of 0.070 ppm was exceeded somewhere in the SCAB on 36 percent of days during the three-year period.

The highest state 8-hour ozone concentration recorded in the SCAB over the last three available years (2015-2017) is 0.136 ppm, which is 1.9 times the standard. This concentration occurred in 2017 at the San Bernardino station. The standard was exceeded somewhere in the SCAB on 36 percent of days during the three-year period (SCAQMD, 2019b).

According to the most recent EPA-approved SCAB emissions inventory, the total VOC emissions within the SCAB in 2012 were 470 tons/day (SCAQMD, 2017b). By comparison, the highest VOC emissions increment associated with the Revised Project was 430 lb/day (0.2 tons/day), which is 0.04 percent as large as the total SCAB emissions. As discussed above for NO_2, the Revised Project's NO_x emissions increment is 0.5 percent as large as the total SCAB emissions. Therefore, the Revised Project's contribution to regional ozone levels would be relatively small.

Potential Health Effects. In developing the ozone standards, EPA (2013b) and CARB (2005c) have prepared comprehensive reports on the possible health effects associated with ozone exposure. The main conclusions of the agencies are:

- EPA (2013b) concluded that a causal relationship exists between short-term ozone exposure and respiratory effects. A causal relationship is likely to exist between short-term ozone exposure and cardiovascular effects and mortality. Evidence is suggestive of a causal relationship between short-term ozone exposure and central nervous system effects. A causal relationship is likely to exist between long-term ozone exposure and respiratory effects. Evidence is suggestive of a causal relationship between long-term ozone exposure and cardiovascular effects, reproductive and developmental effects, central nervous system effects, and mortality. There is little evidence for a relationship between long-term ozone exposure and increased risk of lung cancer. The populations and lifestages that have adequate evidence for increased ozone-related health effects are individuals with certain genotypes, individuals with asthma, younger and older age groups, individuals with reduced intake of Vitamins E and C, and outdoor workers.
- CARB (2005c) concluded that ozone exposure can result in reduced lung function, increased respiratory symptoms, increased airway hyperreactivity and increased airway inflammation, increased mortality, hospitalization for cardiopulmonary causes, emergency room visits for asthma, and restrictions in activity. In controlled human exposure studies, exercising individuals exposed for one hour to an ozone concentration as low as 0.12 ppm or for 6.6 hours to a concentration as low as 0.08 ppm experienced lung function decrements and symptoms of respiratory irritation such as cough, wheeze, and pain upon deep

inhalation. The lowest ozone concentrations at which airway hyperreactivity (an increase in the tendency of the airways to constrict in reaction to exposure to irritants) has been reported are 0.18 ppm ozone following 2-hour exposure in exercising subjects, 0.40 ppm following 2-hour exposure in resting subjects, and 0.08 ppm ozone in subjects exercising for 6.6 hours. Airway inflammation has been reported following 2-hour exposures to 0.20 ppm ozone and following 6.6-hour exposure to 0.08 ppm ozone. Children may be more affected by ozone than the general population due to effects on the developing lung and to relatively higher exposure than adults. Also, asthmatics may represent a sensitive sub-population for ozone.

In summary, the Revised Project would produce significant regional emissions of VOC, CO, and NO_x. These emissions would make relatively small contributions to regional levels of CO, NO_2, and ozone. There is currently no methodology available that can accurately quantify regional health effects from CO, NO_2, or ozone exposure associated with an individual project's VOC, CO, or NO_x emissions. Therefore, the above discussion is limited to identifying the Revised Project's potential contribution to regional pollutant levels, and generally describing the types of adverse health effects associated with exposure to those pollutants.

Local Health Effects

This section discusses the relationship between the Revised Project's local criteria pollutant impacts and the potential for adverse health effects to occur for persons exposed to those impacts. The dispersion modeling results in Tables 3.1-12 through 3.1-14 show significant local concentration impacts for NO_2 in 2014 and 2018 and PM_{10} in 2014, 2018, 2023, 2030, 2036, and 2045. Therefore, the criteria pollutants evaluated for local health effects are NO_2 and PM_{10}.

There is currently no methodology available that can accurately quantify local health effects from ambient NO_2 or PM_{10} concentrations associated with an individual project. (As discussed in Section 3.1.4.1, in the RDSEIR, LAHD has established a health effects quantification methodology for significant concentrations of $PM_{2.5}$, which is a subset of PM_{10}; however, the Revised Project's local $PM_{2.5}$ concentrations would be less than significant). Therefore, the extent to which local adverse health effects can be identified in this section is limited to (a) defining the geographical area of significant local impacts; (b) presenting the frequency of significant local impacts; (c) presenting the magnitude of the significant local impacts; and (d) generally describing the types of adverse health effects associated with exposure to NO_2 and PM_{10}.

NO_2 is also an ozone precursor. However, because ozone is formed some time later and downwind from its precursor emission source (EPA, 1998), ozone behaves as a regional pollutant rather than a local pollutant. For example, the highest ozone concentrations are not found in urban areas close to the concentrated sources of its precursors, but rather in suburban and rural areas downwind of these sources (EPA, 2013b). Therefore, the potential health effects associated with ozone exposure were addressed under Regional Health Effects.

Nitrogen Dioxide (NO_2)

Area of Local Impact. Figures 3.1-4 and 3.1-5 show the areas where the modeled NO_2 concentrations associated with the Revised Project plus background would exceed the federal 1-hour standard in 2014 and 2018. Figure 3.1-6 shows the area where the modeled NO_2 concentrations would exceed the state 1-hour standard in 2014. Figures

3.1-7 and 3.1-8 show the areas where the modeled NO_2 concentrations would exceed the state annual standard in 2014 and 2018. These are the areas where the Revised Project would produce significant local NO_2 concentration impacts. The largest impact areas extend north to the industrial area occupied by the Yang Ming container terminal, west to commercial and recreational uses along Pacific Avenue, Front Street, and Harbor Boulevard, and south to the cruise operations, visitor-serving, and open space use areas of the Catalina Express terminal, Cruise Ship Promenade, and World Cruise Center. None of the significant impact areas would extend over existing residences. No significant local NO_2 concentration impacts would occur in 2023 through 2045.

Frequency of Local Impact. Figures 3.1-4, 3.1-5, and 3.1-6 also show the model-predicted frequencies of exceedance of the federal and state 1-hour NO_2 standards associated with the Revised Project plus background at selected off-terminal locations throughout the significant impact areas. The model-predicted numbers of exceedances are likely overestimated because the analysis conservatively assumes the background NO_2 concentration, which is added to the modeled Revised Project concentration, remains at its highest level for all modeled hours. In actuality, the background concentration fluxuates from hour-to-hour and day-to-day. There are no frequency-of-exceedance figures for annual concentrations shown in Figures 3.1-6 and 3.1-7 because there is only one annual average concentration per year at each receptor location.

Specifically, Figures 3.1-3 and 3.1-4 show the number of days per year during which at least one hourly NO_2 concentration is predicted to exceed the federal 1-hour threshold of 188 ug/m^3 during operation of the Revised Project in 2014 and 2018. By definition, the federal 1-hour standard is exceeded when the 1-hour threshold is exceeded on at least 8 days per year (i.e., the 98^{th} percentile of the maximum daily 1-hour concentrations). The figures show that the maximum number of exceedance days of the federal 1-hour threshold is 243 days in 2014 and 117 days in 2018. The maximum number of exceedances would occur directly on the southern terminal boundary. As shown in the figures, the numbers of exceedances decline rapidly with distance from the maximum impact point.

Figure 3.1-6 shows the number of hours per year that the NO_2 concentration is predicted to exceed the state 1-hour threshold of 339 ug/m^3 during operation of the Revised Project in 2014. By definition, the state 1-hour standard is exceeded when at least one 1-hour concentration exceeds the threshold. The figure shows that, with the Revised Project, the state 1-hour threshold would be exceeded only 3 hours per year in 2014, directly on the southern terminal boundary.

Magnitude of Local Impact. In terms of the magnitude of NO_2 concentrations, Table 3.1-12 shows that the federal 1-hour NO_2 concentration (Revised Project plus background) reaches a maximum off-terminal value of 286 ug/m^3 in 2014 and 232 ug/m^3 in 2018. Therefore, the federal 1-hour concentrations above the standard within the Revised Project's significant impact areas range from 188 to 286 ug/m^3 (0.10 to 0.15 ppm), depending on the analysis year and location within the exceedance area. The table also shows that the state 1-hour NO_2 concentration reaches a maximum off-terminal value of 343 ug/m^3 in 2014. Therefore, the state 1-hour concentrations above the standard within the Revised Project's significant impact area range from 339 to 343 ug/m^3 (0.180 to 0.182 ppm), depending on the location within the exceedance area. Finally, the table shows that the annual NO_2 concentration reaches a maximum off-terminal value of 66 ug/m^3 in 2014 and 57 ug/m^3 in 2018. Therefore, the annual concentrations above the standard within the Revised Project's significant impact area range from 57 to 66 ug/m^3 (0.030 to 0.035 ppm), depending on the analysis year and location within the exceedance area. The low end of each range represents the most stringent state or federal ambient air quality standard, and the high end represents the highest predicted concentration anywhere within the exceedance area.

Potential Health Effects. The potential health effects associated with NO_2 exposure are described above under Regional Health Effects.

Figure 3.1-4. Area of Threshold Exceedance for the Revised Project; 2014 Federal 1-Hour NO_2 Concentrations

Figure 3.1-5. Area of Threshold Exceedance for the Revised Project; 2018 Federal 1-Hour NO_2 Concentrations

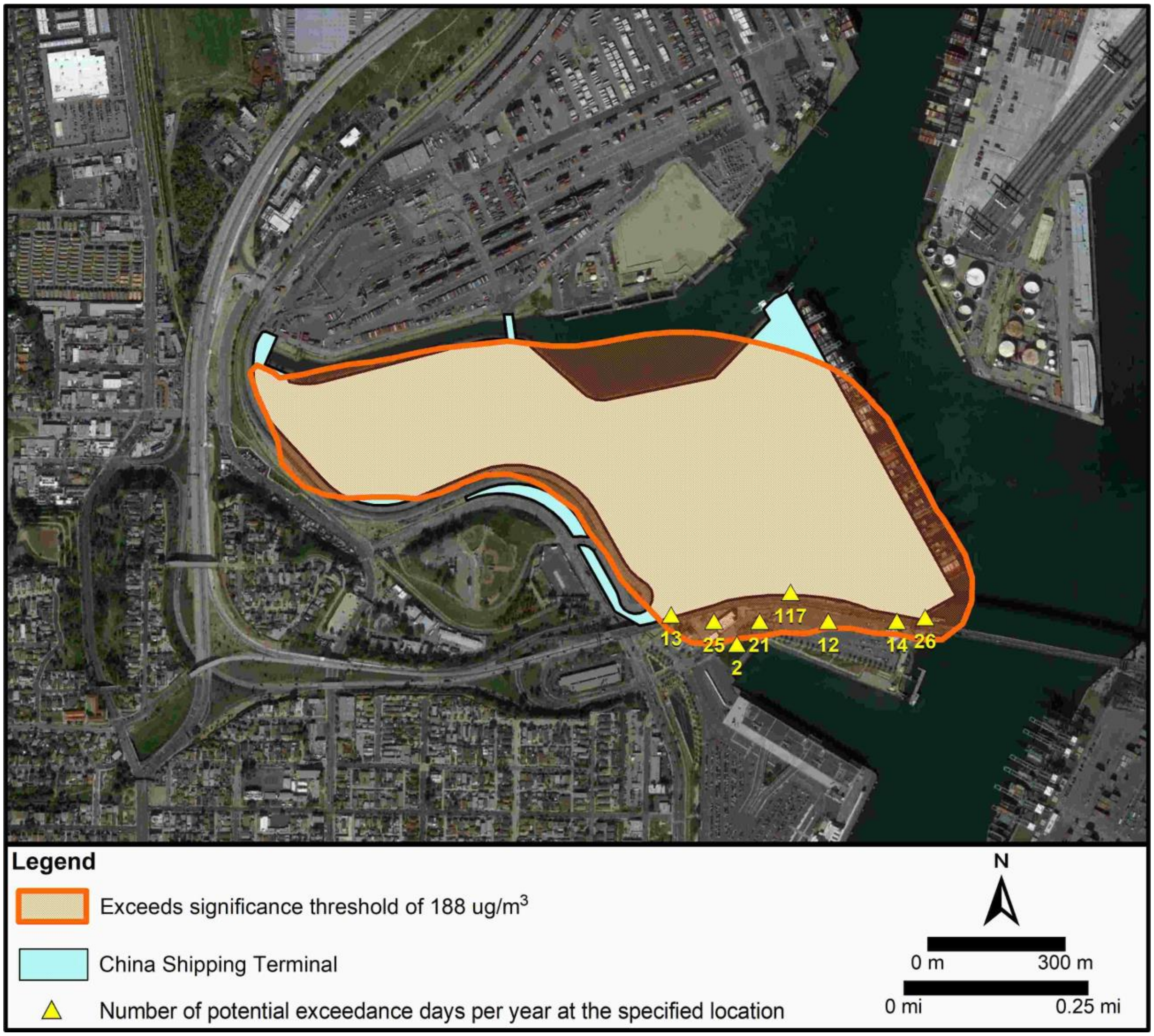


Figure 3.1-6. Area of Threshold Exceedance for the Revised Project; 2014 State 1-Hour NO_2 Concentrations

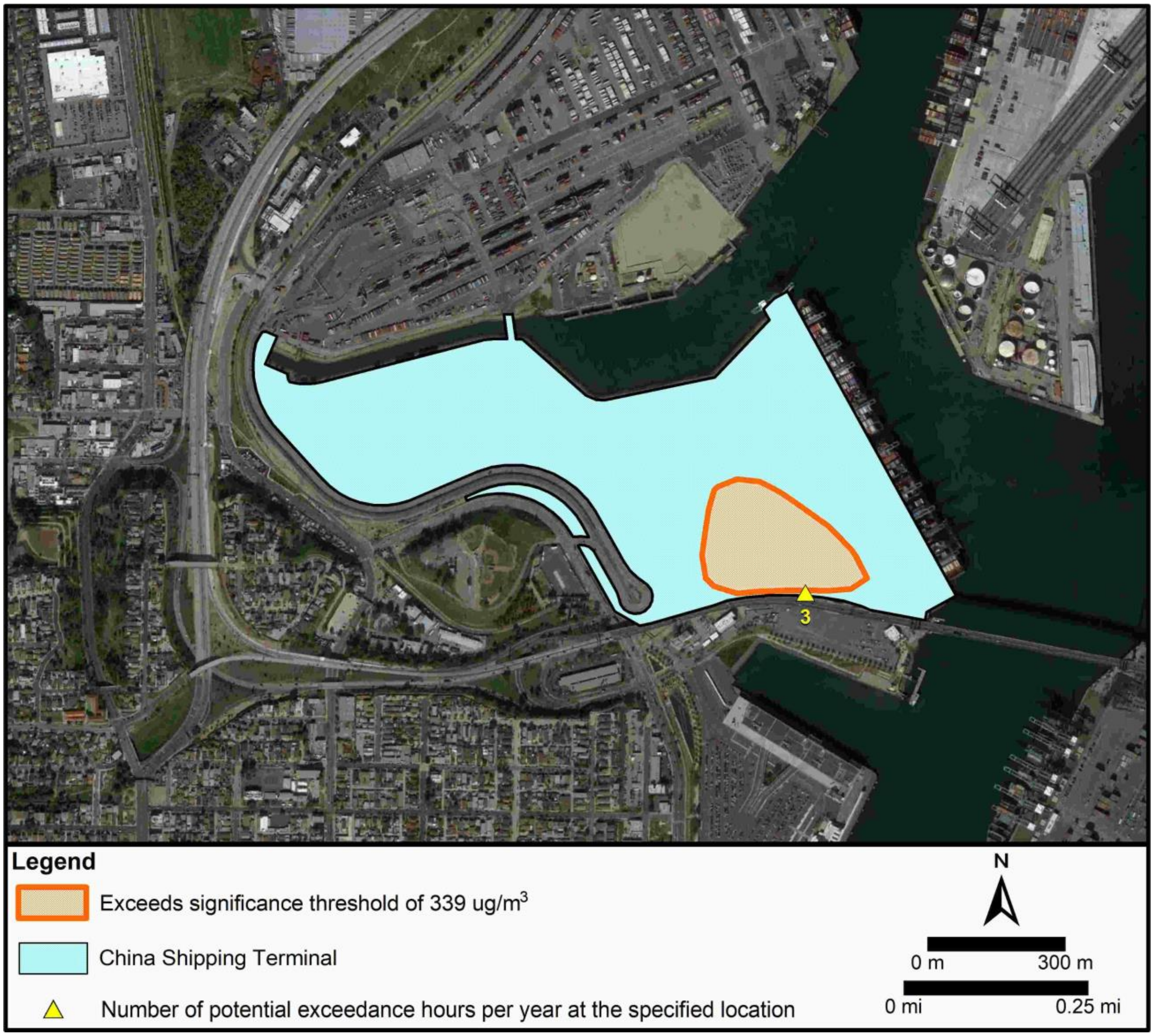


Figure 3.1-7. Area of Threshold Exceedance for the Revised Project; 2014 Annual NO_2 Concentrations

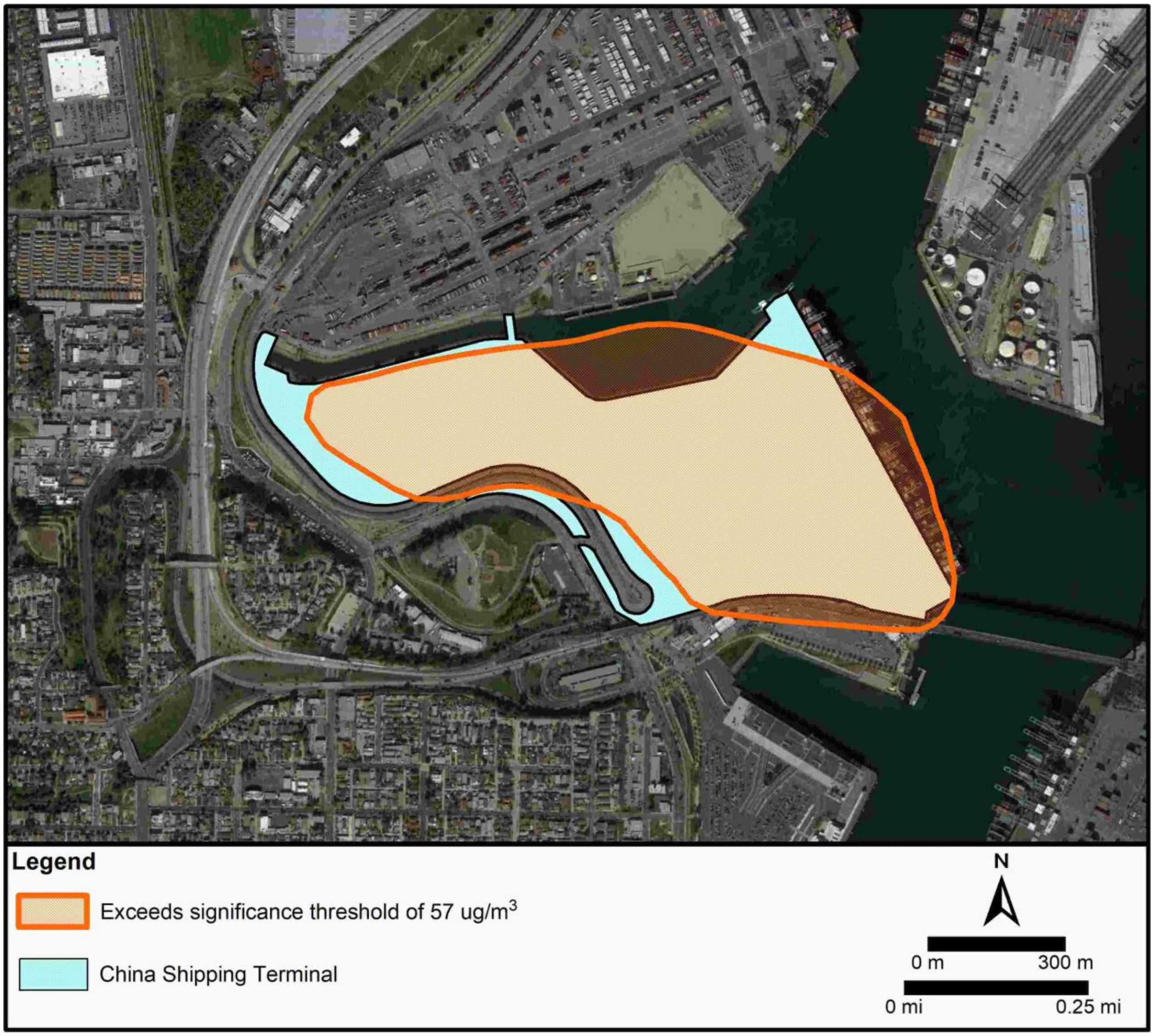
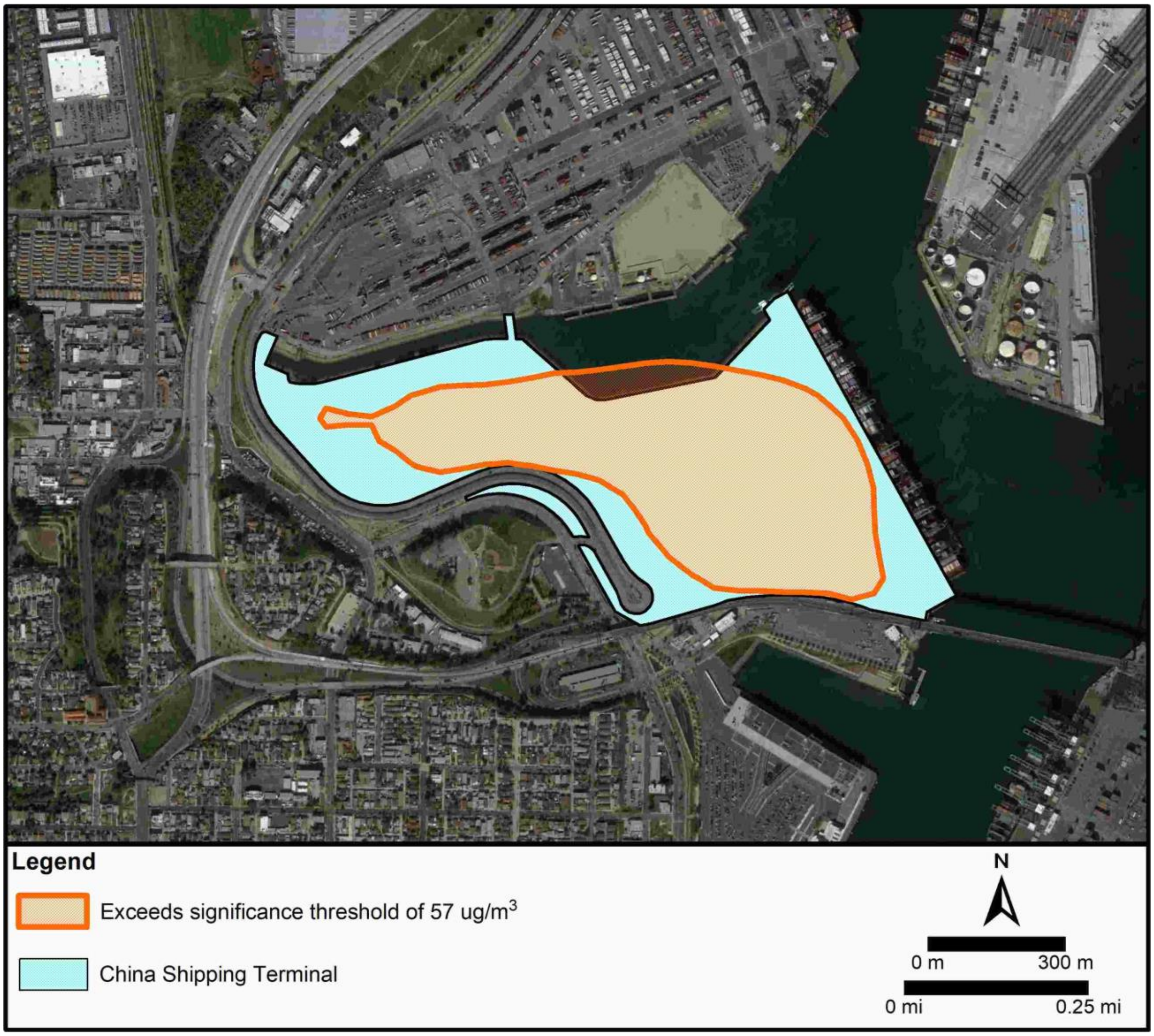


Figure 3.1-8. Area of Threshold Exceedance for the Revised Project; 2018 Annual NO_2 Concentrations



Particulate Matter Less than 10 Microns (PM_{10})

The SCAB is currently classified as nonattainment for the state 24-hour and annual PM_{10} standards. Locally, Table 3.1-3 shows that the Wilmingon Community Station, about 1.6 miles north of the China Shipping terminal, exceeded the 24-hour standard in two of the last three available years (2015-2017). There was one exceedance day in 2015 and two exceedance days in 2017. The highest observed concentration of 69.9 ug/m^3 is 40 percent higher than the standard of 50 ug/m^3. The Wilmington Community Station exceeded the annual PM_{10} standard in all three years (2015-2017). The highest observed concentration of 25.5 ug/m^3 is 28 percent higher than the standard of 20 ug/m^3.

Area of Local Impact. Figures 3.1-9 through 3.1-14 show the areas where the modeled PM_{10} concentration increments associated with the Revised Project would exceed the SCAQMD's 24-hour significance threshold of 2.5 ug/m^3 in 2014 through 2045. Figures 3.1-15 through 3.1-20 show the areas where the modeled PM_{10} concentration increments would exceed the SCAQMD's annual significance threshold of 1.0 ug/m^3 in 2014 through 2045. These are the areas where the Revised Project would produce significant local PM_{10} concentration increments. The project increments would be in addition to the existing PM_{10} concentrations that already occur in the Revised Project impact areas. The existing concentrations may already exceed the state standards, given the nonattainment status of the region and the readings at the Wilmington Community Station. The largest Revised Project significant impact areas extend north into the industrial use area of the Yang Ming container terminal, west to commercial and recreational uses along Front Street, and south to the cruise operations, visitor-serving, and open space uses of the Catalina Express terminal and Cruise Ship Promenade. None of the Revised Project's significant impact areas would extend over existing residences.

Frequency of Local Impact. Figures 3.1-9 through 3.1-14 also show the model-predicted frequencies of exceedance of the SCAQMD's 24-hour threshold at selected off-terminal locations throughout the Revised Project's significant impact areas. There are no frequency-of-exceedance figures for annual concentrations because there is only one annual average concentration per year at each receptor location. The figures show the number of days per year that the Revised Project's concentration increment is predicted to exceed the SCAQMD's 24-hour significance threshold of 2.5 ug/m^3. The figures show that the maximum number of threshold exceedance days is 58 days per year in 2014. The maximum number of exceedances would occur directly on the southern terminal boundary. As shown in the figures, the numbers of exceedances decline rapidly with distance from the maximum impact point. The figures also show a substantial reduction in the number of exceedances after analysis year 2023 (from a maximum of 33 days per year in 2023 to 9 days per year in 2030).

Magnitude of Local Impact. To estimate the magnitude of PM_{10} concentrations to which individuals in the exceedance areas would be exposed, it was necessary to add the Revised Project concentration increments from Table 3.1-12 to background PM_{10} concentrations measured at the Wilmington Community Station. Derived from the most recent three-year observation period leading up to the analysis years, the 24-hour PM_{10} background concentrations were determined to be 86.8 ug/m^3 for 2014 and 69.9 ug/m^3 for 2018 and beyond. The annual PM_{10} background concentrations were determined to be 28.3 ug/m^3 for 2014 and 25.5 ug/m^3 for 2018 and beyond.

Summing the Revised Project concentration increments and background concentrations results in maximum off-terminal 24-hour PM_{10} concentrations of 93 ug/m^3 in 2014, 75 ug/m^3 in 2018 and 2023, and 74 ug/m^3 in 2030, 2036, and 2045. The maximum off-terminal annual PM_{10} concentrations are 30 ug/m^3 in 2014 and 27 ug/m^3 in 2018, 2023, 2030, 2036, and 2045. Therefore, the total PM_{10} concentrations above the standard within the Revised Project's significant impact areas range from 50 to 93 ug/m^3 for 24-hour concentrations and 20 to 30 ug/m^3 for annual concentrations, depending on the analysis year and location within the exceedance area. The low end of each range represents the ambient air quality standard, and the high end represents the highest predicted concentration anywhere within the exceedance area.

Potential Health Effects. In developing the PM_{10} standards, EPA (2009) and CARB (2002) have prepared comprehensive reports on the possible health effects associated with PM_{10} exposure. The SCAQMD also reviewed PM_{10}-related health effects in Appendix I of its *Final 2016 Air Quality Management Plan* (SCAQMD, 2017b). Most of the health effects findings made by these agencies focus on $PM_{2.5}$, which is a subset of PM_{10}. Although the local $PM_{2.5}$ impacts from the Revised Project would be less than significant, the $PM_{2.5}$-related health effects are included in the following bullets as part of the overall health effects from PM_{10}. The main conclusions of the agencies are:

- EPA (2016) concluded that a causal relationship exists between $PM_{2.5}$ exposure (both short- and long-term) and cardiovascular effects and mortality. A causal relationship is likely to exist between $PM_{2.5}$ exposure (both short- and long-term) and respiratory effects. Evidence is suggestive of a causal relationship between long-term $PM_{2.5}$ exposure and reproductive and developmental effects, cancer, mutagenicity, and genotoxicity. For the portion of PM_{10} greater than 2.5 microns ($PM_{10\text{-}2.5}$), EPA concluded that evidence is suggestive of a causal relationship between short-term $PM_{10\text{-}2.5}$ exposure and cardiovascular effects, respiratory effects, and mortality. Older adults have heightened responses for cardiovascular morbidity with PM exposure. Children are at an increased risk of PM-related respiratory effects. Individuals with underlying cardiovascular disease or asthma may be at an increased risk for adverse effects.
- CARB (2007b) concluded that the potential health effects associated with PM exposure include mortality, increased hospital admissions for cardiopulmonary causes, acute and chronic bronchitis, asthma attacks and emergency room visits, respiratory symptoms, and days with some restriction in activity. These adverse health effects have been reported primarily in infants, children, the elderly, and those with preexisting cardiopulmonary disease. CARB also classifies the portion of PM_{10} produced by diesel engine exhaust (diesel particulate matter, or DPM) as a toxic air contaminant exhibiting carcinogenic effects. A quantitative health risk assessment of the Revised Project's emissions of DPM and other toxic air contaminants is presented in Impact AQ-7.
- SCAQMD (2017) concluded that there is a causal relationship between $PM_{2.5}$ exposure and cardiovascular effects and mortality. Specific cardiovascular effects include cardiovascular deaths, hospital admissions for ischemic heart disease and congestive heart failure, changes in heart rate variability and markers of oxidative stress, and markers of atherosclerosis. A causal relationship is likely to exist between $PM_{2.5}$ exposure and respiratory effects, such as hospital admissions for COPD or respiratory infections, asthma development, asthma or allergy exacerbation, lung cancer, impacts on lung function, lung inflammation, oxidative stress, and airway hyperresponsiveness. Both short-term and long-term PM exposures are linked to health effects in humans. Young children, older adults, and people with pre-existing respiratory or cardiovascular health conditions are among those who may be more susceptible to the adverse effects of PM. The SCAQMD also found that the DPM portion of PM_{10} is a significant contributor to the cancer risk associated with toxic air contaminants in the SCAB. For example, the average lifetime risk for excess cancer cases in the SCAB from all sources is estimated to be 367 per million. SCAQMD's *Multiple Air Toxics Exposure Study IV* (MATES IV) determined that DPM is responsible for about 68 percent of the risk (SCAQMD, 2015a).

In summary, the Revised Project would produce significant local concentration impacts of NO_2 and PM_{10}. The Revised Project's significant impact areas would extend over industrial, commercial, and recreational land uses near the China Shipping terminal. There is currently no methodology available that can accurately quantify local health effects from ambient NO_2 or PM_{10} concentrations associated with an individual project. Therefore, the above discussion is limited to defining the geographical area of significant local impacts, presenting the frequency and magnitude of significant local impacts, and generally describing the types of adverse health effects associated with exposure to NO_2 and PM_{10}.

Figure 3.1-9. Area of Threshold Exceedance for the Revised Project; 2014 24-Hour PM_{10} Concentration Increments

Figure 3.1-10. Area of Threshold Exceedance for the Revised Project; 2018 24-Hour PM_{10} Concentration Increments

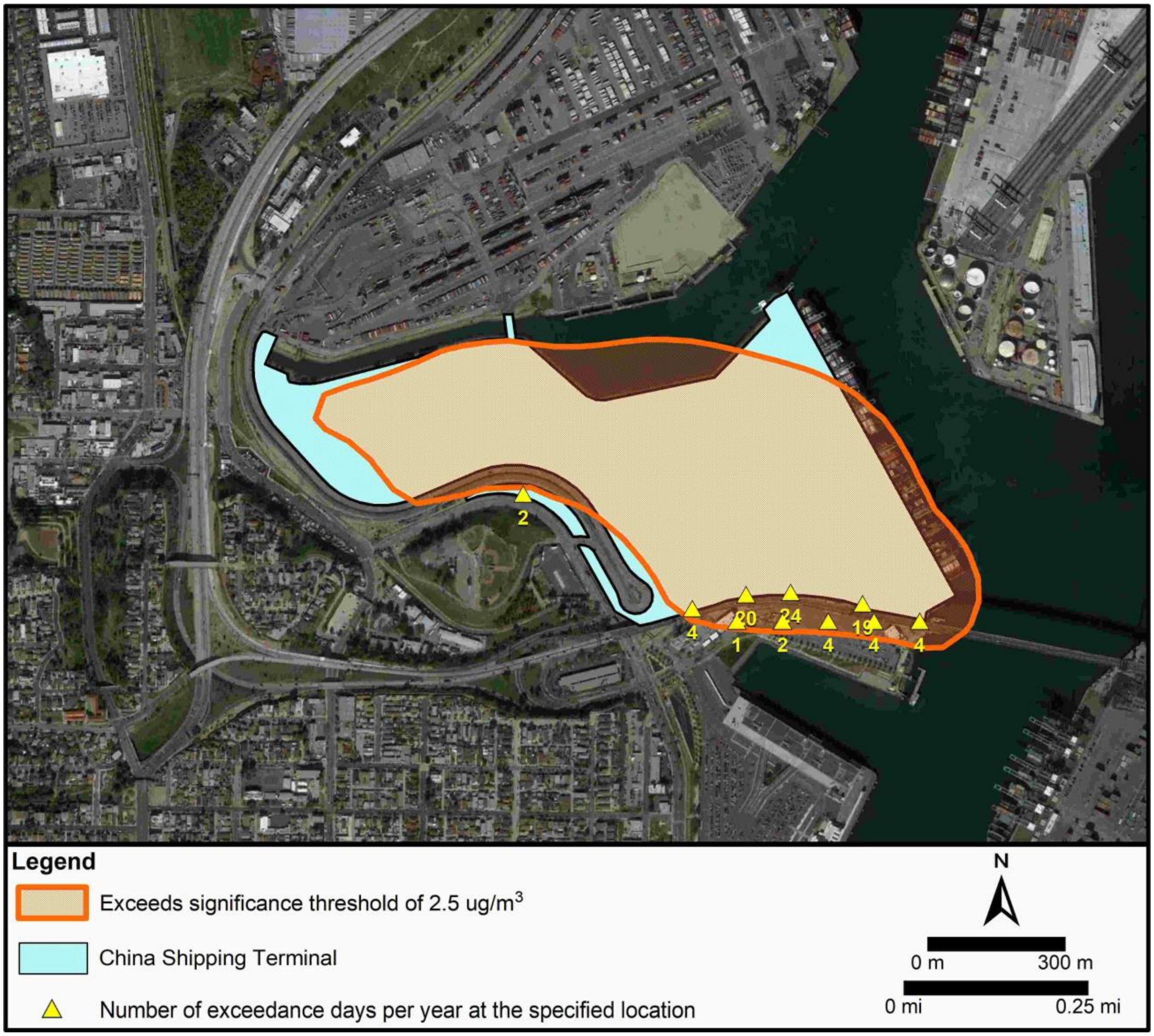


Figure 3.1-11. Area of Threshold Exceedance for the Revised Project; 2023 24-Hour PM_{10} Concentration Increments

<u>Figure 3.1-12. Area of Threshold Exceedance for the Revised Project; 2030 24-Hour PM_{10} Concentration Increments</u>

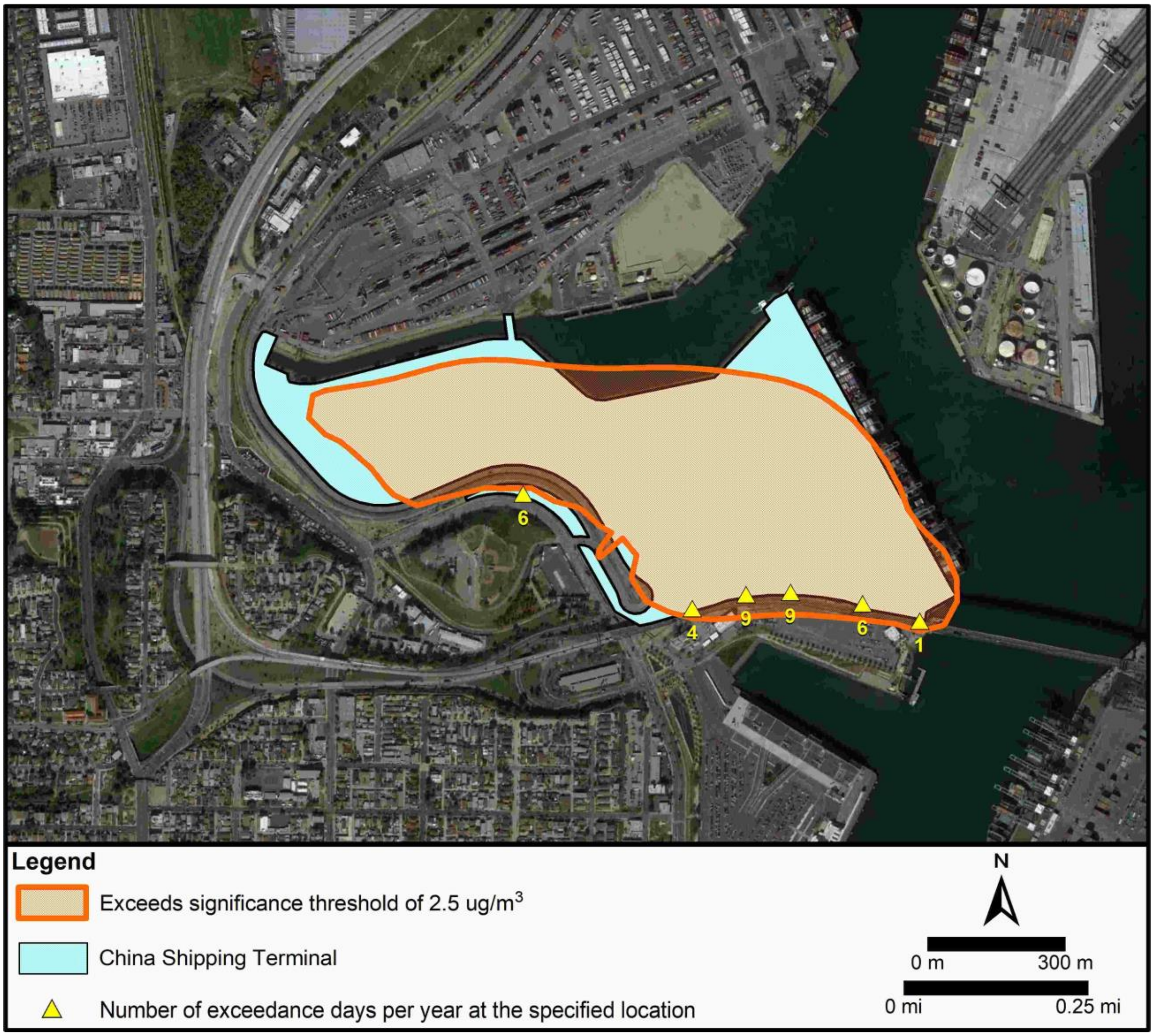


Figure 3.1-13. Area of Threshold Exceedance for the Revised Project; 2036 24-Hour PM_{10} Concentration Increments

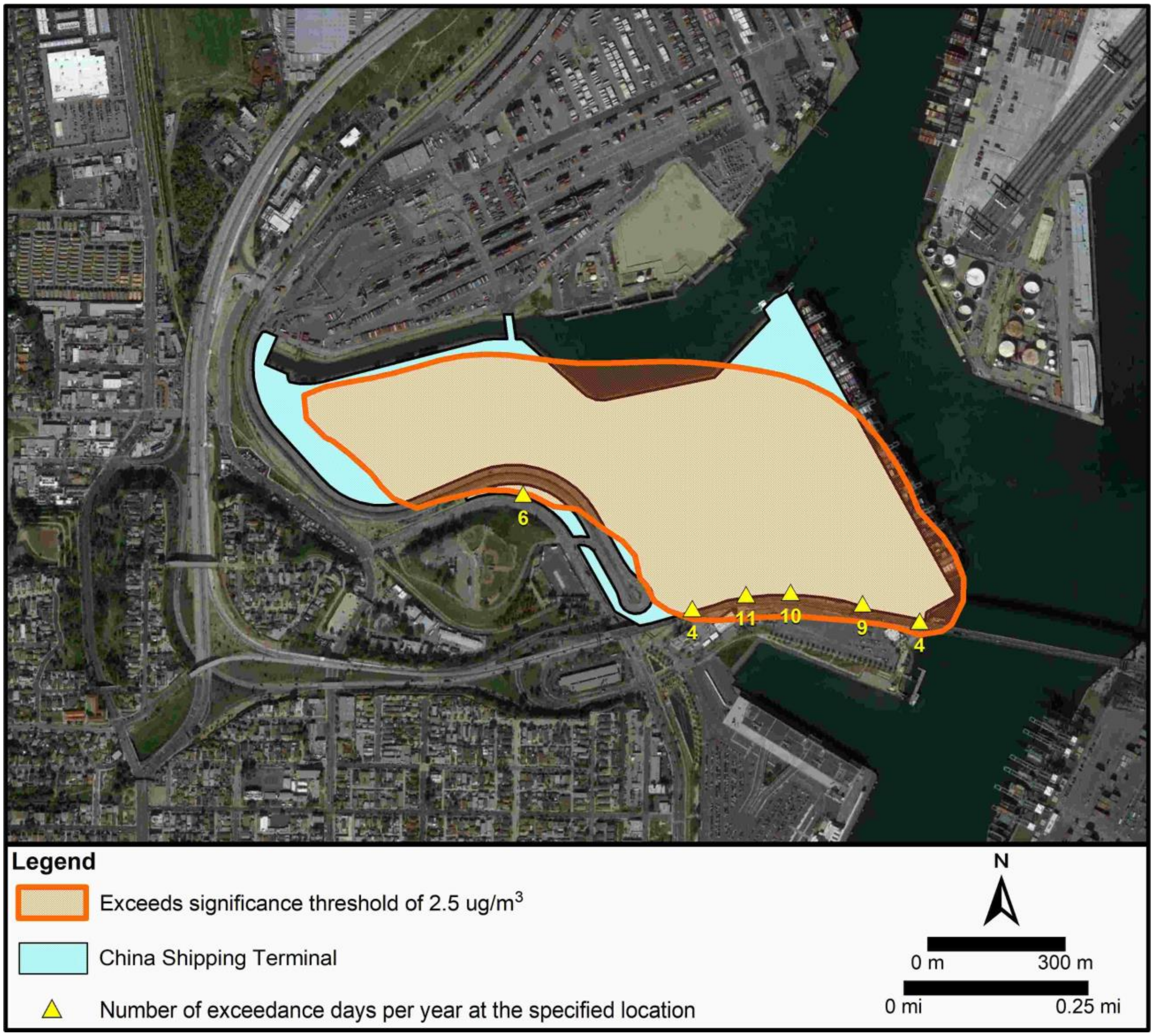


Figure 3.1-14. Area of Threshold Exceedance for the Revised Project; 2045 24-Hour PM_{10} Concentration Increments

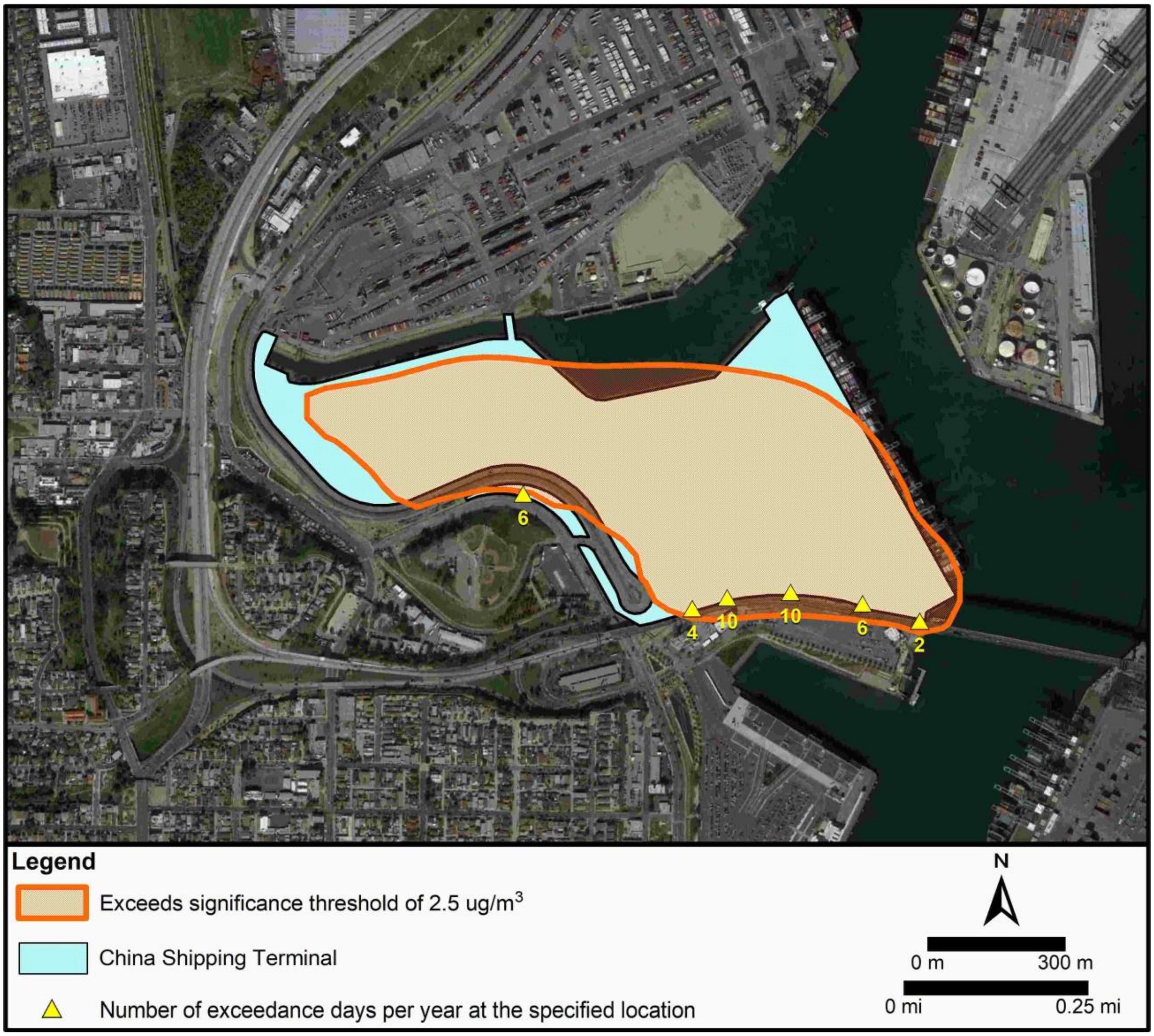


Figure 3.1-15. Area of Threshold Exceedance for the Revised Project; 2014 Annual PM_{10} Concentration Increments

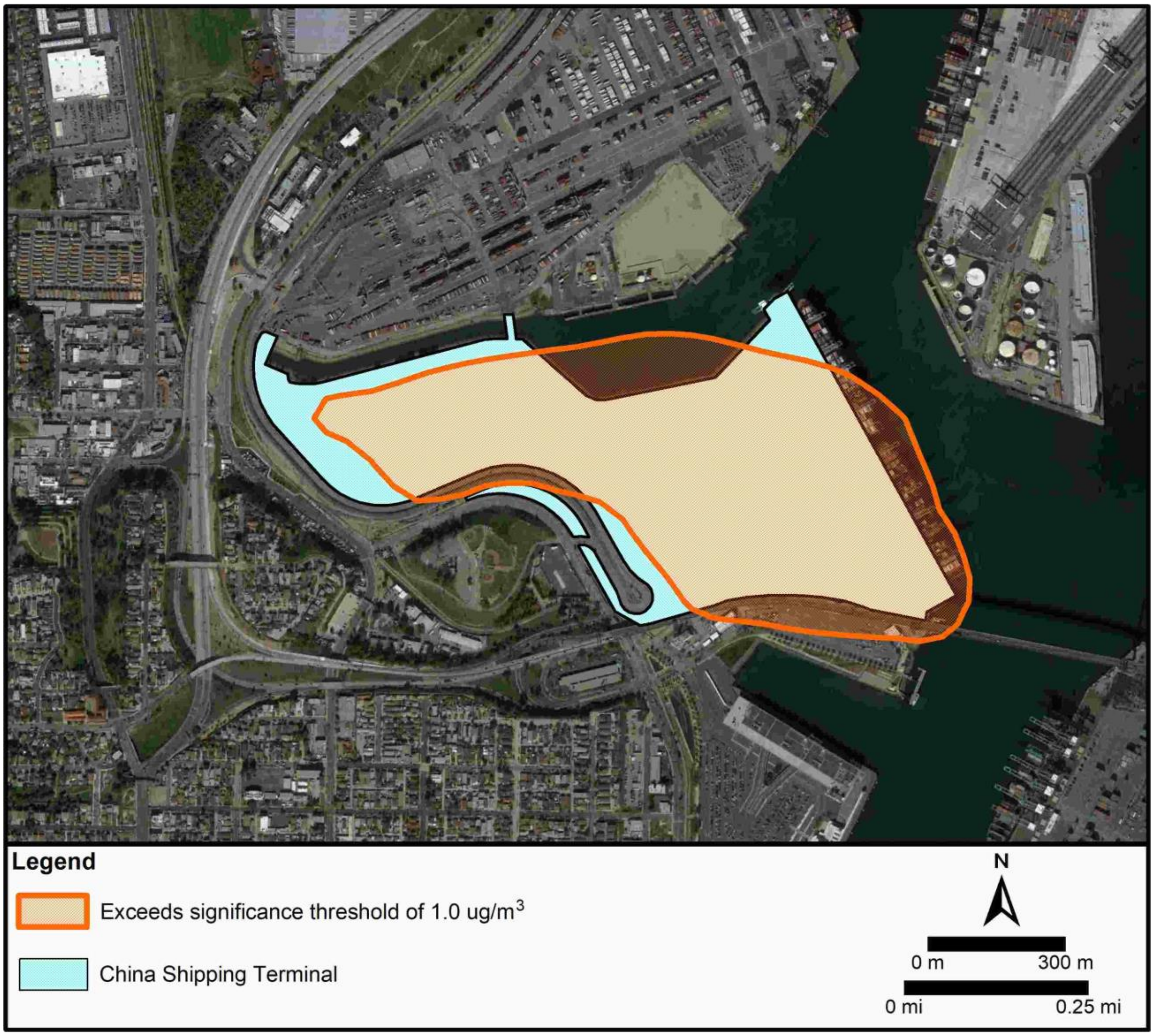


Figure 3.1-16. Area of Threshold Exceedance for the Revised Project; 2018 Annual PM_{10} Concentration Increments

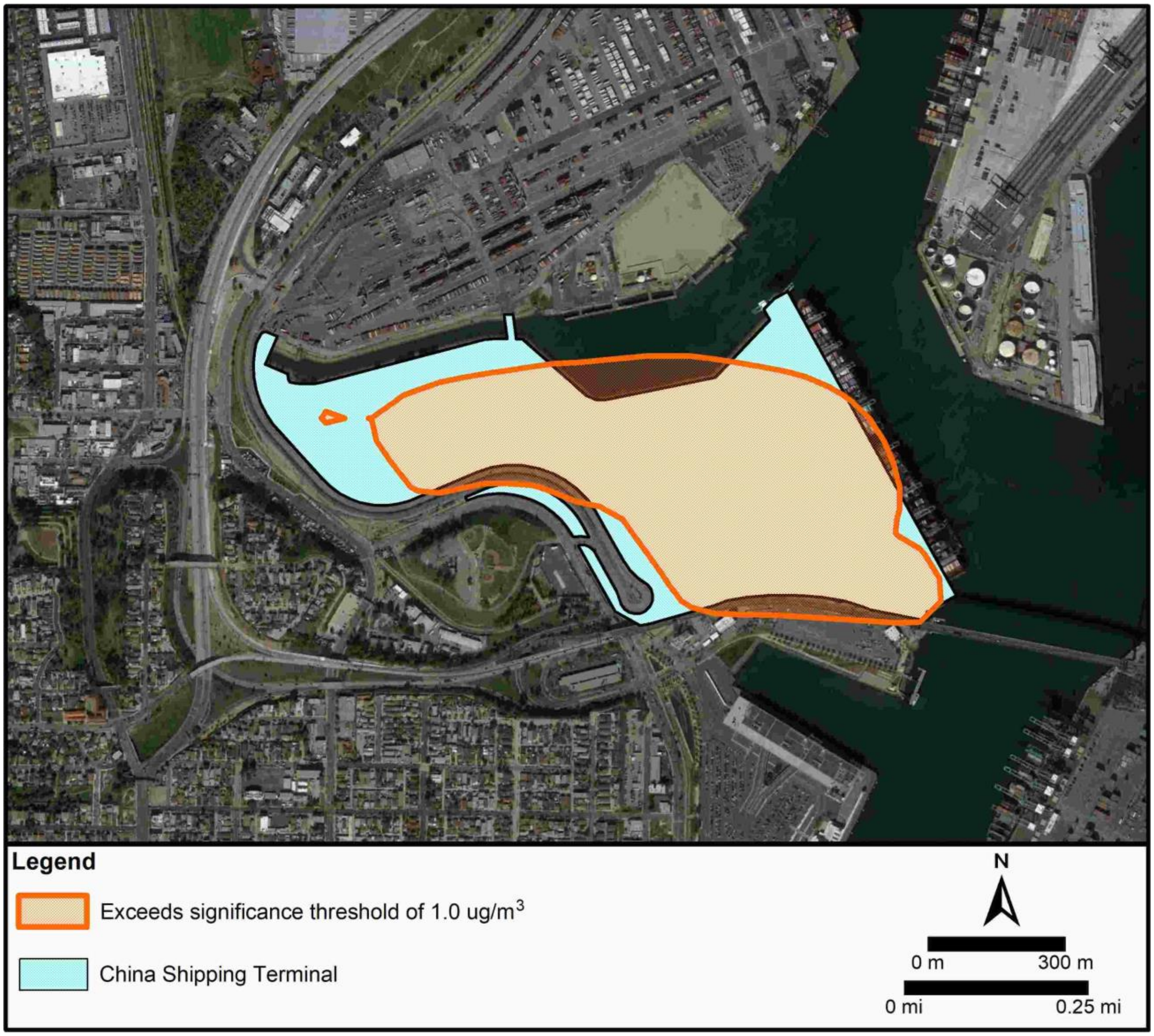


Figure 3.1-17. Area of Threshold Exceedance for the Revised Project; 2023 Annual PM_{10} Concentration Increments

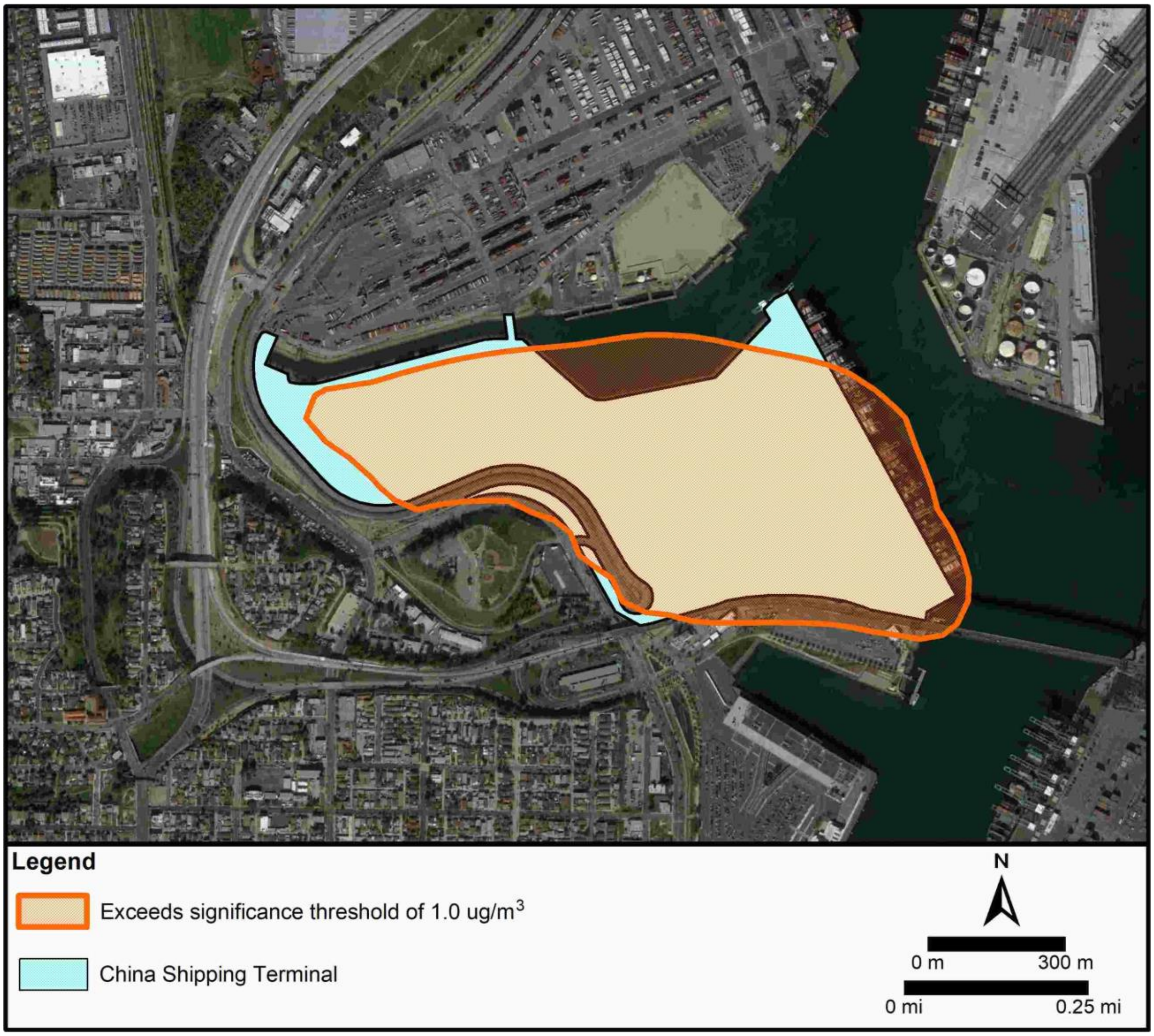


Figure 3.1-18. Area of Threshold Exceedance for the Revised Project; 2030 Annual PM_{10} Concentration Increments

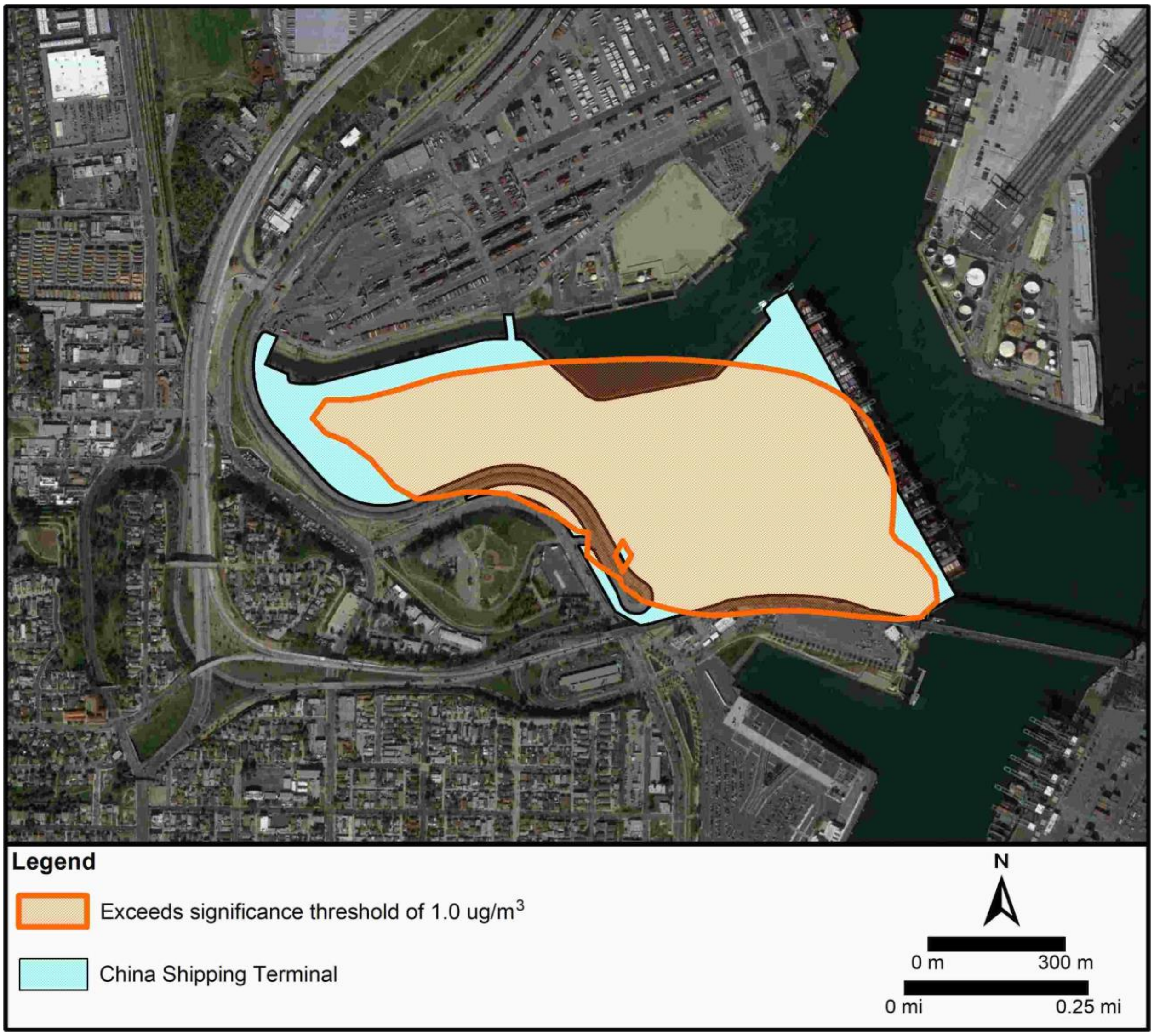


Figure 3.1-19. Area of Threshold Exceedance for the Revised Project; 2036 Annual PM_{10} Concentration Increments

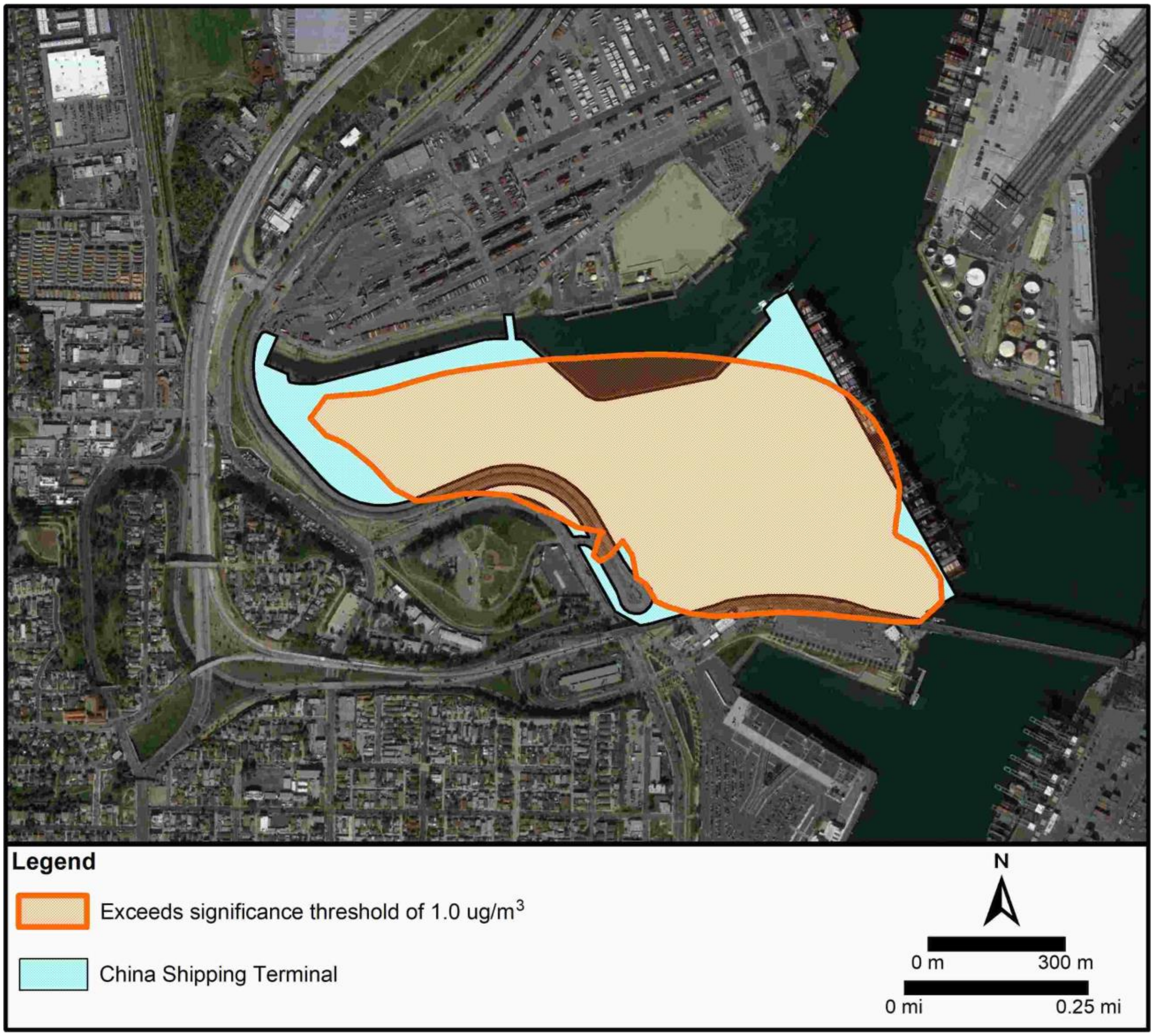
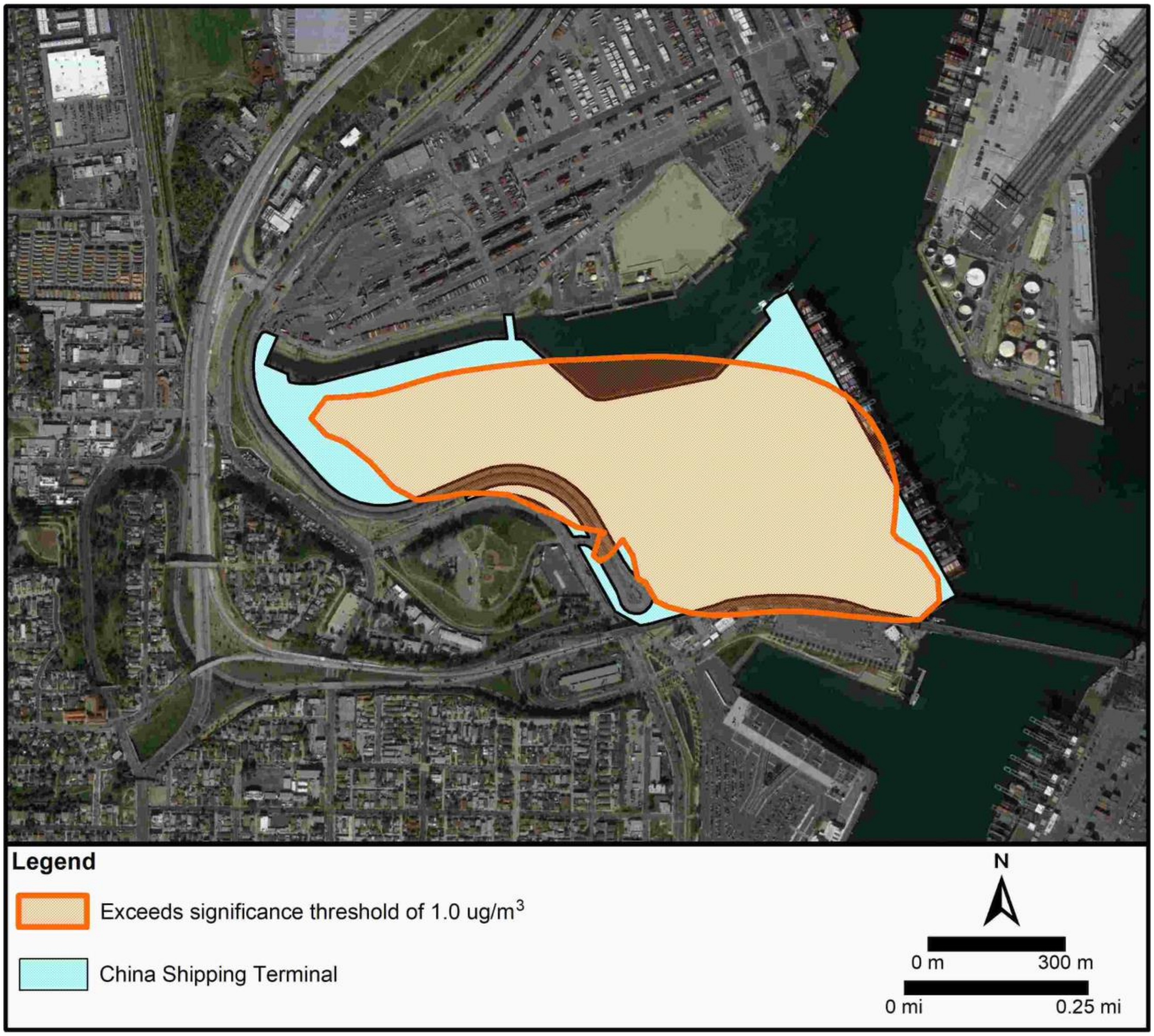


Figure 3.1-20. Area of Threshold Exceedance for the Revised Project; 2045 Annual PM_{10} Concentration Increments



Section 3.1.5 Page 3.1-76

Revised the mitigation monitoring program as follows:

AQ-3: The Revised Project would result in operational-related emissions that exceed an SCAQMD threshold of significance. **AQ-4: The Revised Project operation would result in offsite ambient air pollutant concentrations that exceed a SCAQMD threshold of significance.** **AQ-7: The Revised Project operation would expose sensitive receptors to significant levels of TACs.**	
Mitigation Measure	**MM AQ-10. Vessel Speed Reduction Program (VSRP).** Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area~~or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~
Timing	Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter.
Methodology	LAHD will include this mitigation measure in new lease amendment with tenant.
Responsible Parties	Tenant, LAHD.
Residual Impacts	Significant and unavoidable

3.2.4.2 Changes Made to Section 3.2 Greenhouse Gas Emissions and Climate Change

Section Summary Page 3.2-2

Revised text of MM AQ-10 as follows:

MM AQ-10: Vessel Speed Reduction Program (VSRP). Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area.~~or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~

Section 3.2.4.4 Page 3.2-22

Revised reference as follows:

- The SCAQMD industrial source threshold is appropriate for projects with future operations continuing as far out as 2050. The SCAQMD threshold development methodology used the EO S-3-05 emission reduction targets as the basis in developing the threshold (SCAQMD, 2008), with the AB 32 2020 reduction requirements incorporated as a subset of EO S-3-05. EO S-3-05 sets an emission reduction target of 80 percent below 1990 levels by 2050. AB 32 requires California to reduce its GHG emissions to 1990 levels by 2020 ~~(SCAQMD, 2016a)~~ (CARB, 2017). AB 32 has the goal of achieving 1990 GHG levels by 2020.

Section 3.2.4.5 Page 3.2-24

Revised text of MM AQ-10 as follows:

MM AQ-10: Vessel Speed Reduction Program (VSRP). Starting on the effective date of a new lease amendment between the Tenant and the LAHD and annually thereafter, at least 95 percent of vessels calling at Berths 97-109 shall ~~either 1)~~ comply with the expanded VSRP of 12 knots between 40 nm from Point Fermin and the Precautionary Area ~~or 2) comply with an alternative compliance plan approved by the LAHD for a specific vessel and type. Any alternative compliance plan shall be submitted to LAHD at least 90 days in advance for approval, and shall be supported by data that demonstrates the ability of the alternative compliance plan for the specific vessel and type to achieve emissions reductions comparable to or greater than those achievable by compliance with the VSRP. The alternative compliance plan shall be implemented once written notice of approval is granted by the LAHD.~~

Section 3.2.4.5 Page 3.2-29

Revised text as follows:

Table 3.2-3 shows that the Revised Project's GHG emissions minus the 2008 Actual Baseline would exceed the GHG threshold of 10,000 mty in all of the study years. No other feasible mitigation for GHG impacts beyond the measures discussed in Section 3.1.4.4 for air quality impacts is available.

Section 3.2.4.5 Page 3.2-30

Revised text of LM GHG-1 as follows:

LM GHG-1 GHG Credit Fund: ~~LAHD shall establish a carbon offset fund, which may be accomplished through a Memorandum of Understanding with the California Air Resources Board or another appropriate entity. The fund shall be used for GHG-reducing projects and programs on Port of Los Angeles property. It shall be the responsibility of the Tenant to contribute to the fund. Tenant shall have the option to either: (i) make a one-time fund contribution of $250,000, payable upon execution of a new lease amendment, or (ii) make a payment in 2030, at the time the peak impact would occur, in an amount calculated based on the market value of carbon credits at that time, and actual GHG emissions that exceed whatever GHG threshold exists at that time as approved by the LAHD. If LAHD is unable to establish the fund within a reasonable period of time, Tenant shall instead purchase credits from an approved GHG offset registry.~~ LAHD shall establish a Greenhouse Gas Fund, which LAHD shall have the option to accomplish through a Memorandum of Understanding (MOU) with the California Air Resources Board (CARB) or another appropriate entity. The fund shall be used for GHG-reducing projects and programs approved by the Port of Los Angeles, or through the purchase of emission reduction credits from a CARB approved offset registry. It shall be the responsibility of the Tenant to make contributions to the fund in the amount of $250,000 per year, for a total of eight years, for the funding of GHG reducing projects or the purchase of GHG emission reduction credits, commencing after the date that the SEIR is conclusively determined to be valid, either by operation of Public Resources Code Section 21167.2 or by final judgment or final adjudication ("Conclusive Determination of Validity Date"), as described below. The fund contribution amount is established as follows: (i) the peak year of GHG operational emissions (2030), after application of mitigation, that exceed the established threshold for the Revised Project, estimated in the SEIR to be 129,336 metric tons CO2e, multiplied by (ii) the current (2019) market value of carbon credits established by CARB at $15.62 per metric ton CO2e. The payment for the first year shall be due within ninety (90) days of the Conclusive Determination of Validity Date, and the payment for each successive year shall be due on the anniversary of the Conclusive Determination of Validity Date. If LAHD is unable to establish the fund through an MOU with CARB within one year prior to when any year's payment is due, the Tenant shall instead apply that year's payment, using the same methodology described in parts (i) and (ii) above, to purchase emission reduction credits from a CARB approved GHG offset registry.

Section 3.2.4.7 Page 3.2-57

Revised text of mitigation monitoring table as follows:

IMPACT GHG-1: The Revised Project would generate GHG emissions, either directly or indirectly, that would exceed the SCAQMD 10,000 mty CO_2e threshold.	
Mitigation Measure	**MM GHG-1: LED Lighting.** All lighting within the interior of buildings on the premises and outdoor high mast terminal lighting will be replaced with LED lighting or a technology with similar energy-saving capabilities within two years after the effective date of the new lease amendment between the Tenant and the LAHD or by no later than 2023.
Timing	Within two years after the effective start date of a new lease amendment between the Tenant and the LAHD or by December 31, 2023~~Tenant must complete replacement of lighting by December 31, 2023~~.
Methodology	LAHD shall include MM GHG-1 in the lease agreement with tenant. Tenant shall implement MM GHG-1 through its own construction contractor. All construction work shall obtain a Harbor Engineers Permit. All work shall comply with Harbor Engineer Permit conditions throughout the construction project. ~~LAHD shall monitor implementation of mitigation measure during operation through the tenant lease.~~
Responsible Parties	LAHD for lease compliance. Tenant through its own construction contractor in conjunction with LAHD.
Residual Impacts	Significant and unavoidable.

IMPACT GHG-1: The Revised Project would generate GHG emissions, either directly or indirectly, that would exceed the SCAQMD 10,000 mty CO_2e threshold.

Mitigation Measure	**LM GHG-1: GHG Credit Fund.** ~~LAHD shall establish a carbon offset fund, which may be accomplished through a Memorandum of Understanding with the California Air Resources Board or another appropriate entity. The fund shall be used for GHG-reducing projects and programs on Port of Los Angeles property. It shall be the responsibility of the Tenant to contribute to the fund. Tenant shall have the option to either: (i) make a one-time fund contribution of $250,000, payable upon execution of a new lease amendment, or (ii) make a payment in 2030, at the time the peak impact would occur, in an amount calculated based on the market value of carbon credits at that time, and actual GHG emissions that exceed whatever GHG threshold exists at that time as approved by the LAHD. If LAHD is unable to establish the fund within a reasonable period of time, Tenant shall instead purchase credits from an approved GHG offset registry.~~ LAHD shall establish a Greenhouse Gas Fund, which LAHD shall have the option to accomplish through a Memorandum of Understanding (MOU) with the California Air Resources Board (CARB) or another appropriate entity. The fund shall be used for GHG-reducing projects and programs approved by the Port of Los Angeles, or through the purchase of emission reduction credits from a CARB approved offset registry. It shall be the responsibility of the Tenant to make contributions to the fund in the amount of $250,000 per year, for a total of eight years, for the funding of GHG reducing projects or the purchase of GHG emission reduction credits, commencing after the date that the SEIR is conclusively determined to be valid, either by operation of Public Resources Code Section 21167.2 or by final judgment or final adjudication ("Conclusive Determination of Validity Date"), as described below. The fund contribution amount is established as follows: (i) the peak year of GHG operational emissions (2030), after application of mitigation, that exceed the established threshold for the Revised Project, estimated in the SEIR to be 129,336 metric tons CO2e, multiplied by (ii) the current (2019) market value of carbon credits established by CARB at $15.62 per metric ton CO2e. The payment for the first year shall be due within ninety (90) days of the Conclusive Determination of Validity Date, and the payment for each successive year shall be due on the anniversary of the Conclusive Determination of Validity Date. If LAHD is unable to establish the fund through an MOU with CARB within one year prior to when any year's payment is due, the Tenant shall instead apply that year's payment, using the same methodology described in parts (i) and (ii) above, to purchase emission reduction credits from a CARB approved GHG offset registry.
Timing	~~During operations.~~ Upon execution of a new lease amendment between the Tenant and the LAHD and within ninety days of the Conclusive Determination of Validity Date as specified in the measure.
Methodology	~~LAHD shall include LM GHG-1 in the lease agreement with tenant.~~ LAHD shall monitor implementation of lease measure during operation through the tenant lease. LAHD will include this measure in the new lease amendment with tenant. LAHD shall verify that an appropriate fund has been established by the Conclusive Determination of Validity Date, and tenant shall make the first installment of the monetary contribution within ninety (90) days of the Conclusive Determination of Validity Date, and successive installments on the anniversary of that date. If LAHD is unable to establish a GHG fund within one year prior to payment, tenant shall instead apply that year's payment to purchase emission reduction credits from a CARB-approved GHG offset registry. Enforcement shall include oversight by the Real Estate Division.
Responsible Parties	Tenant and LAHD~~, Tenant~~
Residual Impacts	Significant and unavoidable.

3.2.4.3 Changes Made to Section 3.3 Ground Transportation

Section Summary, Page 3.3-2

Revised MM TRANS-2 because the City of Los Angeles Bureau of Engineering has delayed this project. While it was originally scheduled to complete design and begin construction in 2019, the project is still in the design phase and the current schedule predicts construction from the 4^{th} quarter of 2020 through the 3^{rd} quarter of 2021. Since the schedule may continue to change, the LAHD will continue to coordinate with the Bureau and if LADOT approves the project, will construct the necessary improvements at the same time as the Bureau's project. Revised measure is:

> **MM TRANS-2 Alameda & Anaheim Streets:** Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with design/construction commencing in the first quarter of 2019,~~ subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.

Section 3.3.2.2 Page 3.3-5

Revised text as follows:

This intersection is being considered for improvements, however. A project under design by LADOT and the City of Los Angeles Department of Public Works, in a funding partnership with LAHD, would widen the west side of Alameda Street near the Anaheim Street intersection to provide three southbound lanes. The project would also reconstruct Alameda Street and may include re-striping Alameda Street and adjacent street intersection approaches. LAHD's funding participation in the project is estimated at $8.6 million. The project, designated SCAG FTIP ID LAF7205 in the 2017 SCAG Federal Transportation Improvement Program, is still in the design phase and the current schedule predicts construction from the 4^{th} quarter of 2020 through the 3^{rd} quarter of 2021~~estimated to start construction by the end of 2019~~. However, it is not assumed in the 2014 Mitigated Baseline that is used to identify the impacts of the Revised Project's proposed elimination of Mitigation Measure TRANS-2 because it was neither completed by the time of preparation nor had a final design.

Section 3.3.4.4 Page 3.3-22

Revised statement of MM TRANS-2 as follows:

MM TRANS-2 Alameda & Anaheim Streets: Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with design/construction commencing in the first quarter of 2019,~~ subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.

Section 3.3.4.6 Page 3.3-32

Revised the Mitigation Monitoring table as follows:

TRANS-2: Long-term vehicular traffic associated with the Revised Project would significantly impact volume/capacity ratios or level of service.	
Mitigation Measure	**MM TRANS-2. Alameda & Anaheim Streets**: Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with design/construction commencing in the first quarter of 2019,~~subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.
Timing	During the City's planned improvement project, in coordination with the Bureau of Engineering's construction schedule~~Design/construction commencing in the first quarter of 2019.~~
Methodology	LAHD Engineering and Goods Movement Divisions will coordinate with the City of Los Angeles' Alameda Street Improvement Project which is being managed by the City's Bureau of Engineering. The project is also subject to LADOT approval; if LADOT approval is not obtained, then this mitigation measure would not be implemented.~~LAHD will coordinate with the City of Los Angeles' Alameda Street Improvement Project.~~
Responsible Parties	LAHD
Residual Impacts	Significant and unavoidable

3.2.5 Changes Made to Chapter 4 Cumulative Analysis

Section Summary Page 4-1

Revised MM TRANS-2 as follows:

MM TRANS-2 Alameda & Anaheim Streets: Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with design/construction commencing in the first quarter of 2019,~~ subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.

Section 4.2.1.2 Page 4-16

The text of Section 4.1.1.2 has been supplemented as follows:

The contribution of the Revised Project to cumulative impacts was assessed using SCAQMD's guidance (SCAQMD, 2003), which states that projects that exceed SCAQMD's project-level significance thresholds are considered by SCAQMD to have cumulatively considerable impacts. Conversely, projects that do not exceed the project-level thresholds are generally not considered to have cumulatively considerable impacts. Significance thresholds are presented in Section 3.1.4.3. SCAQMD guidance does not distinguish between attainment and nonattainment pollutants, and this analysis assumes that exceedance of any project-level threshold would also constitute a cumulatively considerable impact. For a discussion of the health effects of the Revised Project's significant impacts with respect to criteria pollutants, please see Section 3.1.4.5.

Section 4.2.1.3 Page 4-17

The text of Section 4.2.1.3 of the Recirculated DSEIR has been revised as follows. These revisions do not represent the identification of any new or substantially more severe impact of the Revised Project, compared to those impacts identified in the Recirculated DSEIR

Contribution of the Revised Project (Prior to Mitigation)

Revised Project operational emissions would exceed SCAQMD significance thresholds for CO in analysis years 2012, 2014, 2018, and 2023, for NO_X in 2014, 2018, 2023, 2030, and 2036, and for VOC in all analysis years except 2012; emissions of the remaining criteria pollutants would be below SCAQMD significance thresholds (Table 3.1-9). These impacts, combined with impacts from concurrent related projects, would be cumulatively significant. As a result, operational emissions would make a cumulatively considerable contribution to an existing significant cumulative impact for CO, NO_X, and VOC.

Mitigation Measures and Residual Cumulative Impacts

As described in Section 3.1.4.4, no feasible mitigation beyond the measures included in the Revised Project is available to reduce operational emissions. Accordingly, operational emissions of CO, NO_X, and VOC would continue to exceed SCAQMD significance thresholds in 2023, 2030, 2036, and 2045. These impacts, when combined with impacts from concurrent related projects, would be cumulatively significant. Therefore, the Revised Project would make a cumulatively considerable and unavoidable contribution to an existing significant cumulative impact.

Section 4.2.1.4 Page 4-18

Contribution of the Revised Project (Prior to Mitigation)

Operation of the Revised Project would result in NO_2 concentrations that would exceed the federal one-hour threshold in 2014 and 2018, the state annual one-hour threshold in 2014, and the state annual threshold in 2014 and 2018. Concentrations of PM_{10} would exceed the state 24-hour and annual thresholds in all analysis years except 2012 . These impacts, when combined with impacts from concurrent related projects, would be cumulatively significant. As a result, without mitigation, impacts from project operations would make a cumulatively considerable contribution to an existing significant cumulative impact related to ambient NO_2 and PM_{10} levels.

Mitigation Measures and Residual Cumulative Impacts

As described in Section 3.1.4.4., no feasible mitigation beyond the measures included in the Revised Project is available to reduce operational emissions. Accordingly, operational emissions of the Revised Project would continue to exceed significance thresholds for the federal annual PM_{10} ambient air threshold. These impacts would combine with impacts from concurrent related projects, which would already be cumulatively significant. Therefore the Revised Project would make a cumulatively considerable and unavoidable contribution to an existing significant cumulative impact for NO_2 and PM_{10}.

Section 4.2.3.3 Page 4-36

Revised statement of MM TRANS-2 as follows:

MM TRANS-2 Alameda and Anaheim Streets: Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at the location, ~~with design/construction commencing in the first quarter of 2019,~~subject to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.

Section 4.3 Page 4-69

Revised the Mitigation Monitoring table as follows:

TRANS-3: Vehicular traffic associated with the Revised Project's operations would result in a cumulatively considerable contribution to a significant cumulative impact in study intersection volume/ capacity ratios or level of service.	
Mitigation Measure	**MM TRANS-2: Alameda & Anaheim Streets**: Provide an additional eastbound through-lane on Anaheim Street. This mitigation measure shall be implemented at the same time as the City's planned improvement project at this location, ~~with design/construction commencing in the first quarter of 2019, subject~~ to LADOT approval and in coordination with the Bureau of Engineering's construction schedule.
Timing	During the City's planned improvement project, in coordination with the Bureau of Engineering's construction schedule~~Design/construction commencing in the first quarter of 2019~~.
Methodology	LAHD Engineering and Goods Movement Divisions will coordinate with the City of Los Angeles' Alameda Street Improvement Project which is being managed by the City's Bureau of Engineering. The project is also subject to LADOT approval; if LADOT approval is not obtained, then this mitigation measure would not be implemented~~LAHD will coordinate with the City of Los Angeles' Alameda Street Improvement Project.~~
Responsible Parties	LAHD
Residual Impacts	Significant and unavoidable (unless LADOT approves the measure).
Mitigation Measure	**MM TRANS-3: John S. Gibson Boulevard and I-110 N/B Ramps**: Provide an additional westbound right-turn lane with westbound right-turn overlap phasing and an additional southbound left-turn lane. LAHD shall monitor the intersection LOS annually beginning in 2019 and LAHD shall implement the mitigation within three years after the intersection LOS is measured as D or worse, and the China Shipping terminal is found to contribute to the cumulative impact, with the concurrence of LADOT.
Timing	Within three years after the intersection LOS is measured as D or worse (measurements to begin in 2019 on an annual basis)
Methodology	LAHD will conduct annual measurements of the intersection LOS beginning in 2019 on an annual basis.
Responsible Parties	LAHD with the concurrence of LADOT
Residual Impacts	Less than significant

3.2.6 Changes Made to References

Modified References Chapter as follows:

Section 2.0 Project Description

Added reference as follows:

LAHD, 2016. Cost Scenarios for Expenditure on Cargo-Handling Equipment. Internal LAHD data. July, 2016.

Section 3.1 Air Quality and Meteorology

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SCAQMD, 2019c. *Annual Air Quality Monitoring Network Plan.* July. http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-monitoring-network-plan/annual-air-quality-monitoring-network-plan-v2.pdf?sfvrsn=46

U.S. EPA, 2009. Integrated Science Assessment (ISA) for Particulate Matter (Final Report, Dec 2009). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-08/139F, 2009. https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=216546.

U.S. EPA, 2010b. Integrated Science Assessment for Carbon Monoxide. EPA/600/R-09/019F. January.

U.S. EPA, 2013b. *Integrated Science Assessment (ISA) of Ozone and Related Photochemical Oxidants* (Final Report, Feb 2013). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/076F, 2013. https://cfpub.epa.gov/ncea/isa/recordisplay.cfm?deid=247492

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3.2.7 Changes Made to Appendices

3.2.7.1 Appendix B1 Air Emissions

Specific tables in Appendix B1 were updated based on revisions discussed in Section 3.2.4.1 of this chapter to peak-day ship (OGV) hotelling emissions for years 2023 through 2045 of the Revised Project. The updated tables in Appendix B1 are B1-136, 154, 156, 158, 160, 671, 672, 673, 674.

3.2.7.2 Appendix B2 Air Dispersion Modeling

Added text in Section 1, page B2-2

Updates related to fine grid dispersion modeling

Six fine-grid dispersion model runs that were not performed for the Recirculated DSEIR were modeled for the Final SEIR. As a result, several NO2 concentrations have been revised to slightly higher values and their locations have moved slightly. The revised tables and figures are included in the Final SEIR. All of the concentrations to which revisions have been made would remain well below the significance thresholds. Therefore, this revision would not change any of the significance findings in the Recirculated DSEIR.

Tables and Figures updated:

Due to the updates to dispersion modeling results explained above, the following tables in Appendix B2 were updated: Tables B2-7, B2-11.

Due to the updates to dispersion modeling results explained above, the following figures in Appendix B2 were updated: Figures B2-4, B2-5, B2-6, B2-7, B2-25, B2-26.

Appendix B1
Air Emissions

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China Shipping Air Emissions Calculations
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Emissions Summaries with Proposed Mitigations (Revised Project)

1.0 Emissions Methodology – Models and Tools

This Final SEIR (FSEIR) represents an analysis of the emissions from continued operation of the CS Terminal at 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. In addition, the baseline for this FSEIR 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; (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 EMFAC2017 (CARB, 2018). This EPA-approved model replaces EMFAC2014, and the previous EMFAC2007 which was used in the 2008 EIR/EIS. As the latest version of the model, EMFAC2017 represents CARB's current understanding of motor vehicle travel activities and their associated emission levels. As part of CARB's Technical Documentation for the EMFAC2017 model, CARB has identified the following overview of major changes to the EMFAC model with release of EMFAC2017 (CARB, 2018a):

    - Additional capability to come up with emission estimates for all three GHG pollutants CO2, CH4, and N2O. A GHG module consistent with CARB's official methodology is developed and included in the EMFAC2017. In addition to update to criteria pollutants, EMFAC2017 model also incorporates updated CO2 emission rates for light duty vehicles using national fuel efficiency data from www.fueleconomy.gov, the official U.S. government source for fuel efficiency information.
    - A new module to improve the characterization of activity and emissions from transit buses. Transit buses, namely, the "urban buses" category in EMFAC
    - Updates to both running and start exhaust emission rates using new Federal Test Procedure (FTP) data from the US EPA's In-Use Vehicle Program (IUVP) and emission test data from the CARB's Vehicle Surveillance Program (VSP). These updates have resulted in higher start emissions and lower running exhaust emissions for most of the light duty vehicles in today's fleet. Due to lack of data on evaporative emissions, EMFAC2014 evaporative emissions are used for EMFAC2017.

- Compared to EMFAC2014, NOx and PM emission factors for heavy duty diesel trucks and buses are higher in EMFAC2017. Adjustments were made to the frequency of all NOx and PM related TM&M categories for 2010+ MY engines. There is an update to the emission rate increase associated with PM related TM&M.
- EMFAC2017 implemented major updates on activity profile for both LDVs and HDs using the latest vehicle data collected since its previous release.
- Policy effects update: The final version of the Phase 2 rule was published in October 25, 2016. The Phase 2 standards are the second phase of federal heavy– duty GHG standards and build upon the Phase 1 standards. The regulation imposes new requirements for newly manufactured compression and spark ignited engines in Class 2b through Class 8 vehicles (CARB, 2018a).

In addition to the EMFAC2017 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 night-time 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 the 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

This Final SEIR employs one baseline scenario: 2008 actual activity and actual compliance with 2008 EIS/EIR mitigations (the "2008 Actual Baseline"). The 2008 Actual Baseline would be identical to a "2008 Mitigated Baseline" since the conditions during the 2008 Baseline were found to be in compliance with the 2008 EIR/EIS mitigations being evaluated in this document, and therefore, there is no difference between a 2008 Mitigated Baseline and the 2008 Actual Baseline used in this Final SEIR. This Final SEIR uses the 2008 Actual Baseline in determining the significance of incremental changes (impacts) of operational emissions and pollutant concentrations, such as AQ-4 and AQ-7, respectively.

Two future conditions (2018 to 2045) scenarios are analyzed in comparison to the 2008 Actual Baseline (the year 2018 is considered a future year because actual terminal activity data are not yet available, necessitating the use of forecasted data from 2017):

> 1) future conditions (2018 to 2045) assuming incremental increase in terminal throughput as shown in Table 2-3 of Section 2.0 and timely implementation of the 2008 EIS/EIR mitigation measures (referred to as the FEIR Mitigated Scenario); and
>
> 2) future conditions (2018 to 2045) assuming an incremental increase in terminal throughput as shown in Table 2-3 of Section 2.0 and implementation of the modified mitigation measures under the Revised Project (referred to as the Revised Project Scenario).

In addition, in this Final SEIR analysis, two past conditions ("interim years" 2012 and 2014) scenarios are analyzed in comparison to the 2008 Actual Baseline, :

> 1) past conditions (in "interim years" 2012 and 2014), assuming actual activity and actual compliance with 2008 EIS/EIR mitigations (referred to as the "2012 Actual and 2014 Actual" under the Revised Project Scenario) and
>
> 2) past conditions (in "interim years" 2012 and 2014) assuming actual activity but also assuming implementation of all mitigation measures required by the 2008 EIS/EIR had occurred in a timely fashion (2012 and 2014 "FEIR Mitigated" Scenarios).

Table B1-A summarizes the study years and characteristics of the two main scenarios analyzed in this Final SEIR, the "Revised Project" and the "FEIR Mitigated". The Revised Project may also be referred to as "Proposed Mitigated" in the Appendix B1 as it pertains to the revisions to mitigations in the SEIR; while the FEIR Mitigated Scenario may also be referenced simply as "Mitigated".

Table B1-A: FInal SEIR Analysis Years and Scenarios for Air Quality Analysis

<table>
<tr><th rowspan="2">Scenario Referred to as</th><th rowspan="2">Study Year</th><th colspan="2">Revised Project (or "Proposed Mitigated")</th><th colspan="2">FEIR Mitigated (or simply "Mitigated")</th></tr>
<tr><th>Activity</th><th>Mitigation</th><th>Activity</th><th>Mitigation</th></tr>
<tr><td>Actual Baseline</td><td>2008</td><td colspan="4">Actual activity, and actual compliance of 2008 EIS/EIR mitigations</td></tr>
<tr><td rowspan="2">Past Years</td><td>2012</td><td>actual</td><td rowspan="3">Actual compliance level of 2008 EIS/EIR mitigations</td><td>actual</td><td rowspan="7">Full compliance with 2008 EIS/EIR Mitigations</td></tr>
<tr><td>2014</td><td>actual</td><td>actual</td></tr>
<tr><td rowspan="5">Future Years</td><td>2018</td><td>projected</td><td>projected</td></tr>
<tr><td>2023</td><td>projected</td><td rowspan="4">Revised Project proposed mitigations (as of this Final SEIR)</td><td>projected</td></tr>
<tr><td>2030</td><td>projected</td><td>projected</td></tr>
<tr><td>2036</td><td>projected</td><td>projected</td></tr>
<tr><td>2045</td><td>projected</td><td>projected</td></tr>
</table>

In addition, as described in Appendix B3, a floating Future Baseline emissions inventory was developed to assess cancer risk. The floating Future baseline uses 2008 activity levels, but uses emission factors, projected over the 25-, 30-, and 70-year exposure periods, that incorporate the effects of existing air quality regulations. The floating baseline does not include effects of mitigation measures from either the Revised Project or FEIR Mitigated Scenario; rather, it includes solely the future effects of existing air quality regulations. The floating baseline is only used for cancer risk impact evaluation and not evaluated against other impacts such as ambient concentrations or 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. Terminal 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 2013-2018 Port of Los Angeles Emissions Inventories (LAHD 2014-2018). 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-B 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 RSEIR analysis and planned for future implementation at the Project level were treated as mitigation.

Table B1-B: Regulations and Agreements Assumed as Part of the 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).	**EPA Engine Standards for Marine Diesel Engines:** NO_X, HC, and CO engine	**EPA Emission Standards for Non-road Diesel Engines:** Engine	**EPA Emission Standards for On-road Trucks:** Tiered standards gradually phased in over all	**EPA Emission Standards for Locomotives:** Tier 0 through Tier 4 standards gradually

Container Ships	Tugboats	Terminal Equipment	Trucks	Trains
NO_X engine emission limits for new engines.[a] **EPA Engine Standards for Marine Diesel Engines:** NO_X, HC, and CO engine 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.	emission standards for new engines. **CARB Regulation to Reduce Emissions from Diesel Engines on Commercial Harbor Craft:** Requires that harbor craft engines meet EPA's most stringent emission standards per an accelerated, rule-specified compliance schedule. **California Diesel Fuel Regulation:** 15 ppm sulfur.	standards for newly built engines. **CARB Mobile CHE at Ports and Intermodal Rail Yards:** Emission performance standards on new and in-use terminal equipment**.** **California Diesel Fuel Regulation:** 15-ppm sulfur.	years due to normal truck fleet turnover. **California Diesel Fuel Regulation:** 15-ppm sulfur. **Heavy Duty Diesel Vehicle Idling Emission Reduction 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.	phased in over all years due to normal locomotive fleet turnover. **CARB 1998 South Coast Locomotive Emissions Agreement:** Cleaner 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 RSEIR are summarized in Tables B1-661 through 676 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 2008 baseline, 2012 and 2014 past years were based on actual vessel call records for vessels visiting China Shipping terminal in 2008, 2012 and 2014 respectively. 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 OGV emissions.

3.1.1 Emission Factor Assumptions:

- Emission factors for propulsion engines, auxiliary engines, and auxiliary boilers were obtained from the Port Emissions Inventories (LAHD 2018). The Port Emissions Inventories provided emission factors by Tier level which were combined to reflect the age mix of vessels in each analysis years for operations. These are shown in Table B97 through 100.
- Based on the POLA inventories, 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 2008, 2012 and 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 2008, 2012 and 2014 respectively. Emissions factors by tier were combined into fleet-wide average based on the fleet mix for each ship TEU category.
- The mix of older and newer ships calling at CS in future years (2018-2045) was predicted using POLA CEQA Terminal Level Container Ship Forecast for Tier 3 Engines (POLA 2015). A fleet mix baseline based on 2014, the last year of actual activity, 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, 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 2008, 2012 and 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 B1-101 to B1-104 and were obtained from the POLA Emissions Inventories.

Table B1-C. 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 2008, 2012 and 2014 calculations, auxiliary engine and boiler loads by TEU ship category were obtained from the Port Inventories (LAHD 2018). 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 baseline and interim past years calculations, speeds by transit zone were obtained from 2008, 2012 and 2014 call records. For future years, the BERTHA model provided estimated transit speed by zone, including annual percent compliance with VSRP.
- 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 baseline and interim past years were determined from actual vessel call records for the Revised Project. This is summarized in Table B1-135.
- 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 95% under the Revised Project per the proposed mitigations, and 100% under the FEIR Mitigated Scenario, per 2008 EIS/EIR mitigations.
- 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 2008, 2012 and 2014 were obtained from the POLA inventories. The average hoteling time per call for future analysis years (2018-2045) was determined by BERTHA model and was based on anticipated shipping schedules, future projected lifts per call, ship work rates, and crane productivity. The average hoteling time for baseline, interim past years and future years are summarized in Table B1-106 and Table B1 –134 for FEIR Mitigated and Revised Project respectively.
- Peak day hoteling times for past years 2008-2014 were derived from actual terminal call records. Peak day hoteling times were determined by BERTHA model for each future analysis year (2018-2045) and ship size 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 the Port Inventories (LAHD, 2018). The connectivity time is summarized in Tables B1-106, and B1-134 for FEIR Mitigated and Revised Project scenarios, respectively.
- Annual AMP utilization is assumed to be 95% of annual calls per proposed mitigations in the Revised Project for years 2023 through 2045; and 100% of annual calls per EIR/EIS mitigations in the FEIR Mitigated Scenario for years 2012 through 2045.
- Peak day emissions represent the day of highest in-harbor emissions from OGVs depending on compliance and activity conditions for each year, and therefore, it may involve no AMP usage during hotelling when applicable, according to call data; that may be, for example, a day with high in-harbor activity and no usage of shorepower. Peak day of OGV emissions for years 2008-2018 assumes no AMP usage for all peak day berthing vessels under the Revised Project based on actual call data records. Peak day emissions under the FEIR Mitigated scenario for years 2008-2018 assume AMP usage for all berthing vessels during the peak day based on the 100% annual compliance requirement of 2008 EIR/EIS mitigation.
- Peak day of OGV emissions for years 2023-2045 assume usage of AMP for all vessels at berth during the peak day, based on mitigation requirements from both the Revised Project and FEIR Mitigated Scenario.

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).
- 2008, 2012 and 2014 peak day emissions are derived from analyzing emissions from days of highest 24hr consecutive activity within harbor in 2008, 2012 and 2014 vessel call records respectively, 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. Three sets of data were analyzed: one for 2018, 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 POLA inventories, based on 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 RSEIR analyzes two different scenarios, which affect OGV emissions, 1) what-if scenarios where baseline, past years and future years 2018-2045 are subject to 2008 FEIR/EIS mitigations, i.e. FEIR Mitigated, 2) scenario where future years 2023-2045 are subject to Proposed Mitigations in RSEIR, 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:
  - 2005-2009: 70 percent of annual ship calls use AMP
  - 2010: 90 percent of annual ship calls use AMP
  - 2011, and thereafter: 100 percent of annual ship calls use AMP
  - 2009 and thereafter: 100 percent of annual vessel calls comply with VSRP.
- Revised Project Scenario: From 2019 onward
  - 95 percent of annual vessel calls use AMP when hoteling at berth;
  - 95 percent of annual 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 B1-633 to 660 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 2018).
- Tugboat main and auxiliary engine sizes and load factors were obtained from the Port Emissions Inventories (LAHD 2018).
- 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 2008 baseline, 2012 and 2014, average engine model year of harbor craft fleet was obtained from the Port Inventories (LAHD 2018).
- 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

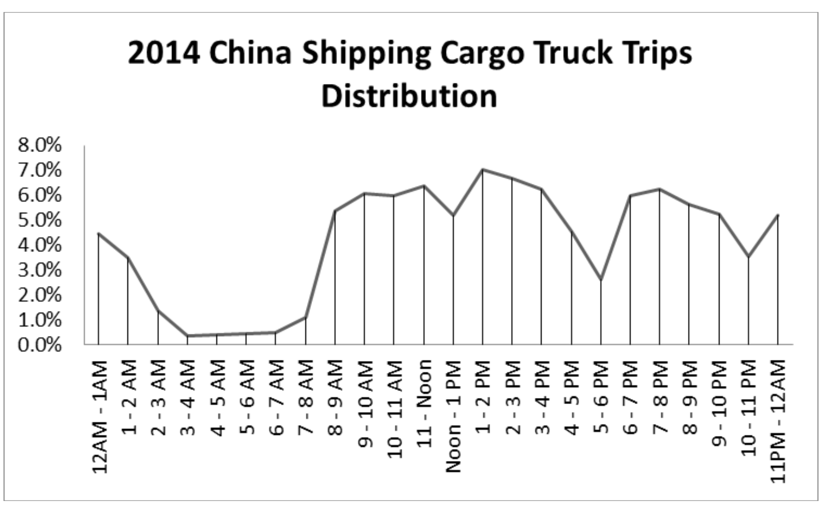
The assumptions below were applied to estimate peak day and annual emissions for drayage trucks handling cargo for the China Shipping terminal. Drayage trucks are heavy duty diesel-fueled trucks, although a small percentage of the fleet servicing POLA terminals are LNG-fueled. Emissions produced by drayage 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.

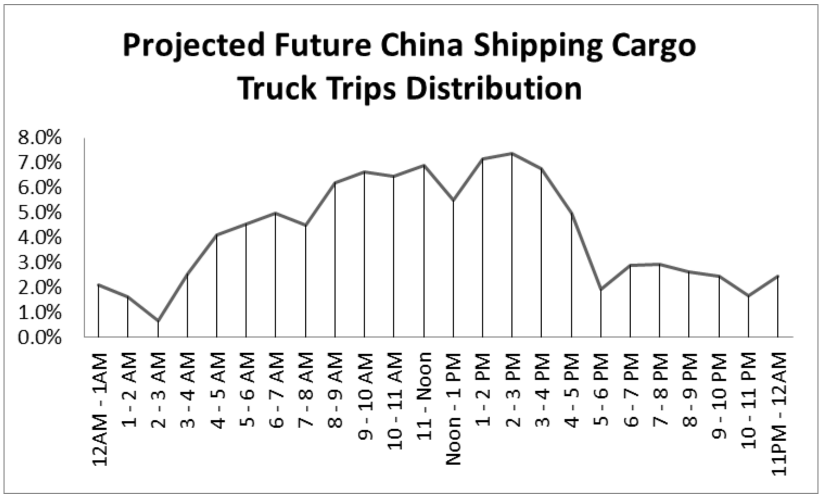
- Emissions from on-road, heavy-duty diesel trucks were calculated using emission factors generated by the EMFAC2017 on-road mobile source emission factor model (CARB, 2018). Emission factors by model year were aggregated into composite fleet-wide emission factors using the Port drayage truck fleet mix 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 B1-392 of Appendix B1.
- Trucks fueled with liquefied natural gas (LNG) composed 8.2% of the POLA truck calls in the year 2014 (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 EMFAC2017 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 Port Inventories (LAHD 2018).
- 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- 661 to 676.
- 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. Three versions of the hourly profile were available from transportation modeling, one for the 2008 baseline analysis and 2012, one for year 2014 and one for future scenarios. Sample distribution are shown in Figure B1-A below.

Figure B1-A. China Shipping Truck Trips Time-of-Day Distribution for Year 2014 and Future.





The following revisions to truck assumptions were made to reflect 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 Revised Project 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 emissions:

3.4.1 Equipment and Activity Assumptions:

- 2008 baseline, 2012 and 2014 activity consisting of equipment inventory, specifications and annual hours of operation by piece for entire WBCT were provided by Starcrest from the Port Inventories (LAHD 2018). Baseline actual equipment inventory is summarized in Table B1-1 and Table B1- 49 for FEIR Mitigated and Revised Project respectively in appendix B1.
- 2018 equipment list is based on 2017 cargo handling equipment inventory whereas other 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 2008 baseline, 2012 and 2014 were obtained from the Port Inventories. 2014 analysis year load factors were assumed constant in future years analyzed.
- Emission controls in 2008 baseline, 2012 and 2014 equipment were obtained from the Port Inventories (LAHD 2018).
- 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 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, 2015a) 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 CNG yard tractors meeting the ultra-low NOx standard of 0.02 g/bhp-hr, deteriorated emission rates from FTP-test CARB certification data was obtained from manufacturers. The rates for NOx and other criteria pollutant, and GHGs from this certification data was used to represent yard tractors mitigated under the Revised Project.
- 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. These are used in the mitigations of the FEIR Mitigated Scenario.
- 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 additional 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 following the mitigation requirement shown below.

Table B1-D: 2008 EIR/EIS Mitigation Replacement Schedule for CHE

2008 EIR/EIS Measure Name	Mitigation Language
AQ-15: Yard Tractors at Berth 97-109 Terminal	All yard tractors operated at the Berth 97-109 terminal shall run on alternative fuel (LPG) beginning September 30, 2004, until December 31, 2014 (ASJ Requirement). Beginning in January 1, 2015, all yard tractors operated at the Berth 97-109 terminal shall be the cleanest available NOX alternative-fueled engine meeting 0.015 gm/hp-hr for PM.
AQ-16: Yard Equipment at Berth 121-131 Rail Yard	All diesel-powered equipment operated at the Berth 121-131 terminal rail yard that handles containers moving through the Berth 97-109 terminal shall implement the following measures: • Beginning January 1, 2009, all equipment purchases shall be either (1) the cleanest available NOX alternative-fueled engine meeting 0.015 gm/hp-hr for PM or (2) the cleanest available NOX diesel-fueled engine meeting 0.015 gm/hp-hr for PM. If there are no engines available that meet 0.0150 gm/hp-hr for PM, the new engines shall be

2008 EIR/EIS Measure Name	Mitigation Language
	the cleanest available (either fuel type) and will have the cleanest VDECS. • By the end of 2012, all equipment less than 750 hp shall meet the USEPA Tier 4 on-road or Tier 4 non-road engine standards. • By the end of 2014, all equipment shall meet USEPA Tier 4 non-road engine standards.
AQ-17: Yard Equipment at Berth 97-109 Terminal	September 30, 2004: All diesel-powered toppicks and sidepicks operated at the Berth 97-109 terminal shall run on emulsified diesel fuel plus a DOC (ASJ Requirement). • January 1, 2009: o All RTGs shall be electric. o All toppicks shall have the cleanest available NOX alternative fueled engines meeting 0.015 gm/hp-hr for PM. o All equipment purchases other than yard tractors, RTGs, and toppicks shall be either (1) the cleanest available NOX alternative-fueled engine meeting 0.015 gm/hp-hr for PM or (2) the cleanest available NOX diesel-fueled engine meeting 0.015 gm/hp-hr for PM. If there are no engines available that meet 0.015 gm/hp-hr for PM, the new engines shall be the cleanest available (either fuel type) and will have the cleanest VDEC. • By the end of 2012: all terminal equipment less than 750 hp other than yard tractors, RTGs, and toppicks shall meet the USEPA Tier 4 on-road or Tier 4 non-road engine standards. • By the end of 2014: all terminal equipment other than yard tractors, RTGs, and top-picks shall meet USEPA Tier 4 non-road engine standards. In addition to the above requirements, the tenant at Berth 97-109 shall participate in a 1-year electric yard tractor [truck] pilot project. As part of the pilot project, two electric tractors will be deployed at the terminal within 1 year of lease approval. If the pilot project is successful in terms of operation, costs and availability, the tenant shall replace half of the Berth 97-109 yard tractors with electric tractors within 5 years of the feasibility determination.

After FEIR mitigation-related replacements, CHE characteristics (age/model years) analyzed in future years are based on turnover based on mean useful life assumptions from CARB.

- 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-E: Proposed Mitigation Replacement Schedule for CHE (Revised Project)

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	2022
Forklift up to 18 tons	152	Diesel	2004	2	Tier 4 diesel, or potentially any alternative fuel meeting Tier 4	2020
Forklift up to 18 tons	152	Diesel	2005	2	Tier 4 diesel, or potentially any alternative fuel meeting Tier 4	2021
Forklift up to 5 tons	75	LPG	2011	1	Upgrade to electric	2021
Forklift up to 5 tons	160	LPG	2005	2	Upgrade to electric	2021
Forklift up to 5 tons	160	LPG	2008	2	Upgrade to electric	2021
Forklift up to 5 tons	165	LPG	2002	2	Upgrade to electric	2021
Rub-trd Gantry Crane	454	Diesel	2004	2	Tier 4 hybrid	2024
Rub-trd Gantry Crane	612	Diesel	2003	8	Tier 4 hybrid	2022
Rub-trd Gantry Crane	685	Diesel	2005	5	Upgrade 4 electric, 1 Tier 4 hybrid	2026
Rub-trd Gantry Crane	197	Eco Crane	2011	1	no additional mitigation required, assumed to turn over by end of life	na
Rub-trd Gantry Crane	197	Hybrid	2015	5	no additional mitigation required, assumed to turn over by end of life	na
Top handler	250	Diesel	2002	8	Tier 4 diesel	2020
Top handler	260	Diesel	2006	3	Tier 4 diesel	2020
Top handler	260	Diesel	2007	8	Tier 4 diesel	2022
Top handler	260	Diesel	2008	15	Tier 4 diesel	2024
Top handler	335	Diesel	2011	3	Tier 4 diesel	2024
Top handler	370	Diesel	2014	1	Tier 4 diesel	2024
Yard tractor	195	LPG	2004	53	alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants	2020

Equipment Inventory in 2016	HP	Fuel Type	Model Year	Quantity (WBCT)	Proposed Mitigation Replacement	Replacement Scheduled for
Yard tractor	195	LPG	2007	59	alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants	2020
Yard tractor	195	LPG	2008	43	alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants	2024
Yard tractor	231	LPG	2011	23	alternative-fuel units that meet or are lower than a NOx emission rate of 0.02 g/bhp-hr and Tier 4 final off-road emission rates for other criteria pollutants	2024
Sweeper	100	Diesel	2005	1	alternative fuel or the cleanest available	2025

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 2008 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, 2015b). The 2014 fleet mix for the line-haul locomotive fleet was obtained from the Port 2014 Inventory (LAHD 2015) and baseline 2008, 2012 and all future years used Vision Module-derived fleet mix for each year. The 2008, baseline, 2012 and 2014 fleet mix for PHL switchers were obtained from the Port Inventories (LAHD 2018) and it was conservatively assumed to remain constant as 2014 through 2045 since the 2014 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 B1-166. Similar tables for other analysis 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 B1-168 for the baseline. Similar tables for other analysis 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, on-site driving to employee parking lot and vehicle starts. 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 EMFAC2017 for gasoline light duty vehicles were used to represent worker vehicle emissions (CARB, 2018). 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 EMFAC2017 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	2008

Table B1-1. 2008 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	Emission Controls (% reduction) PM	HC	CO
Electric Wharf Crane	(blank)	(blank)	Electric	(blank)	9		0%	-	0%	0%	0%
Forklift	160	2005	LPG	0.3	3		0%	366	0%	0%	0%
Forklift	160	2008	LPG	0.3	2		0%	176	0%	0%	0%
Forklift	165	1995	LPG	0.3	2		0%	17	0%	0%	0%
Forklift	165	2002	LPG	0.3	2		0%	138	0%	0%	0%
Forklift	152	1994	Diesel	0.3	1		0%	83	0%	0%	0%
Forklift	152	2004	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	152	2005	Diesel	0.3	2		0%	726	0%	0%	0%
Forklift	190	1997	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	190	1999	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	190	2004	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	215	1993	Diesel	0.3	1		0%	363	0%	0%	0%
Rub-trd Gantry Crane	454	2004	Diesel	0.2	2		0%	1,150	0%	0%	0%
Rub-trd Gantry Crane	612	2003	Diesel	0.2	8		0%	2,023	0%	0%	0%
Rub-trd Gantry Crane	685	1999	Diesel	0.2	1		0%	12	0%	0%	0%
Rub-trd Gantry Crane	685	2005	Diesel	0.2	6		0%	4,015	0%	0%	0%
Rub-trd Gantry Crane	180	1983	Diesel	0.2	2		0%	7	0%	0%	0%
Rub-trd Gantry Crane	180	1984	Diesel	0.2	1		0%	1	0%	0%	0%
Top handler	250	1997	Diesel	0.59	5	DOC	100%	778	30%	70%	70%
Top handler	250	2002	Diesel	0.59	9	DOC	100%	6,556	30%	70%	70%
Top handler	250	1990	Diesel	0.59	4	DOC	100%	1,786	30%	70%	70%
Top handler	260	2006	Diesel	0.59	6	DOC	100%	5,484	30%	70%	70%
Yard tractor	174	2000	LPG	0.39	2		0%	92	0%	0%	0%
Yard tractor	195	2004	LPG	0.39	53		0%	21,671	0%	0%	0%
Yard tractor	195	2007	LPG	0.39	59		0%	31,225	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	19,704	0%	0%	0%
Truck	250	2005	Diesel	0.51	2		0%	516	0%	0%	0%
Truck	250	2008	Diesel	0.51	1		0%	138	0%	0%	0%
Sweeper	100	1995	Diesel	0.68	1		0%	32	0%	0%	0%
Sweeper	100	2005	Diesel	0.68	1		0%	83	0%	0%	0%
Man Lift	80	1995	Diesel	0.51	2		0%	148	0%	0%	0%
Side pick	152	1990	Diesel	0.59	1	DOC	100%	0	30%	70%	70%
Side pick	152	1996	Diesel	0.59	1	DOC	100%	0	30%	70%	70%

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. 2008 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2008_Electric Wharf Crane_Electric_(blank)	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG_160_2005	0.286	17.683	1.946	0.060	0.060	-	674.859	0.084	-
2008_Forklift_LPG_160_2008	0.108	2.375	1.040	0.060	0.060	-	674.859	0.021	-
2008_Forklift_LPG_165_1995	1.397	17.030	10.574	0.060	0.060	-	674.859	0.213	-
2008_Forklift_LPG_165_2002	1.207	17.636	8.651	0.060	0.060	-	674.859	0.145	-
2008_Forklift_Diesel_152_1994	0.830	2.945	8.202	0.342	0.315	0.010	852.465	0.172	-
2008_Forklift_Diesel_152_2004	0.370	3.057	4.831	0.206	0.190	0.010	852.476	0.074	-
2008_Forklift_Diesel_152_2005	0.277	2.986	4.454	0.166	0.152	0.010	852.445	0.056	-
2008_Forklift_Diesel_190_1997	0.524	1.212	7.575	0.196	0.181	0.010	852.438	0.081	-
2008_Forklift_Diesel_190_1999	0.493	1.163	7.300	0.184	0.169	0.010	852.453	0.081	-
2008_Forklift_Diesel_190_2004	0.269	1.042	4.685	0.112	0.103	0.010	852.451	0.056	-
2008_Forklift_Diesel_215_1993	1.247	3.842	10.410	0.592	0.544	0.010	852.372	0.172	-
2008_Rub-trd Gantry Crane_Diesel_454_20	0.323	1.064	4.503	0.125	0.115	0.008	852.735	0.047	-
2008_Rub-trd Gantry Crane_Diesel_612_20	0.253	1.002	4.546	0.110	0.101	0.008	840.339	0.053	-
2008_Rub-trd Gantry Crane_Diesel_685_19	0.341	0.926	5.959	0.122	0.112	0.009	845.926	0.073	-
2008_Rub-trd Gantry Crane_Diesel_685_20	0.313	1.057	4.482	0.123	0.113	0.009	864.986	0.042	-
2008_Rub-trd Gantry Crane_Diesel_180_19	1.006	4.340	10.314	0.406	0.374	0.010	853.645	0.238	-
2008_Rub-trd Gantry Crane_Diesel_180_19	0.994	4.311	10.254	0.399	0.367	0.010	853.026	0.238	-
2008_Top handler_Diesel_250_1997	0.507	1.185	7.425	0.189	0.174	0.010	852.373	0.081	-
2008_Top handler_Diesel_250_2002	0.557	1.263	7.865	0.210	0.193	0.010	852.779	0.074	-
2008_Top handler_Diesel_250_1990	2.016	5.498	14.487	1.052	0.968	0.010	854.180	0.173	-
2008_Top handler_Diesel_260_2006	0.319	1.106	4.610	0.123	0.113	0.008	851.207	0.032	-
2008_Yard tractor_LPG_174_2000	1.417	17.506	10.632	0.060	0.060	-	674.859	0.215	-
2008_Yard tractor_LPG_195_2004	0.941	21.968	4.990	0.060	0.060	-	674.859	0.102	-
2008_Yard tractor_LPG_195_2007	0.450	19.048	2.358	0.060	0.060	-	674.859	0.027	-
2008_Yard tractor_LPG_195_2008	0.158	2.392	1.057	0.060	0.060	-	674.859	0.021	-
2008_Truck_Diesel_250_2005	0.201	0.991	4.328	0.102	0.093	0.010	852.036	0.040	-
2008_Truck_Diesel_250_2008	0.115	0.929	2.334	0.090	0.083	0.010	852.493	0.022	-
2008_Sweeper_Diesel_100_1995	1.102	3.604	8.369	0.541	0.498	0.010	852.463	0.251	-
2008_Sweeper_Diesel_100_2005	0.323	3.216	5.021	0.247	0.228	0.010	852.435	0.069	-
2008_Man Lift_Diesel_80_1995	1.182	3.757	8.681	0.601	0.553	0.010	852.460	0.251	-
2008_Side pick_Diesel_152_1990	0.717	2.701	7.601	0.274	0.252	0.010	852.398	0.172	-
2008_Side pick_Diesel_152_1996	0.716	2.701	7.600	0.274	0.252	0.010	852.414	0.172	-

Table B1-3. 2008 FEIR Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2008_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	17,570	0.01	0.34	0.04	0.00	0.00	-	13	0.00	-	-
2008_Forklift_LPG	8,471	0.00	0.02	0.01	0.00	0.00	-	6	0.00	-	-
2008_Forklift_LPG	863	0.00	0.02	0.01	0.00	0.00	-	1	0.00	-	-
2008_Forklift_LPG	6,813	0.01	0.13	0.06	0.00	0.00	-	5	0.00	-	-
2008_Forklift_Diesel	3,792	0.00	0.01	0.03	0.00	0.00	0.00	4	0.00	-	0.00
2008_Forklift_Diesel	16,559	0.01	0	0.09	0.00	0.00	0.00	16	0.00	-	0.00
2008_Forklift_Diesel	33,119	0.01	0.11	0.16	0.01	0.01	0.00	31.12	0.00	-	0.01
2008_Forklift_Diesel	20,699	0.01	0.03	0.17	0.00	0.00	0.00	19.45	0.00	-	0.00
2008_Forklift_Diesel	20,699	0.01	0.03	0.17	0.00	0.00	0.00	19.45	0.00	-	0.00
2008_Forklift_Diesel	20,699	0.01	0.02	0.11	0.00	0.00	0.00	19.45	0.00	-	0.00
2008_Forklift_Diesel	23,423	0.03	0.10	0.27	0.02	0.01	0.00	22.01	0.00	-	0.02
2008_Rub-trd Gantry Crane_Diesel	104,460	0.04	0.12	0.52	0.01	0.01	0.00	98.19	0.01	-	0.01
2008_Rub-trd Gantry Crane_Diesel	247,580	0.07	0.27	1.24	0.03	0.03	0.00	229.33	0.01	-	0.03
2008_Rub-trd Gantry Crane_Diesel	1,692	0.00	0.00	0.01	0.00	0.00	0.00	1.58	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	549,995	0.19	0.64	2.72	0.07	0.07	0.01	524.40	0.03	-	0.07
2008_Rub-trd Gantry Crane_Diesel	261	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	52	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	-	0.00
2008_Top handler_Diesel	114,787	0.02	0.04	0.94	0.02	0.02	0.00	107.85	0.01	-	0.02
2008_Top handler_Diesel	966,988	0.18	0.40	8.38	0.16	0.14	0.01	908.98	0.08	-	0.16
2008_Top handler_Diesel	263,481	0.18	0.48	4.21	0.21	0.20	0.00	248.08	0.05	-	0.21
2008_Top handler_Diesel	841,278	0.09	0.31	4.28	0.08	0.07	0.01	789.35	0.03	-	0.08
2008_Yard tractor_LPG	6,259	0.01	0.12	0.07	0.00	0.00	-	4.66	0.00	-	-
2008_Yard tractor_LPG	1,648,109	1.71	39.91	9.07	0.11	0.11	-	1,226.02	0.18	-	-
2008_Yard tractor_LPG	2,374,689	1.18	49.86	6.17	0.16	0.16	-	1,766.51	0.07	-	-
2008_Yard tractor_LPG	1,498,452	0.26	3.95	1.75	0.10	0.10	-	1,114.69	0.03	-	-
2008_Truck_Diesel	65,840	0.01	0.07	0.31	0.01	0.01	0.00	61.84	0.00	-	0.01
2008_Truck_Diesel	17,548	0.00	0.02	0.05	0.00	0.00	0.00	16.49	0.00	-	0.00
2008_Sweeper_Diesel	2,173	0.00	0.01	0.02	0.00	0.00	0.00	2.04	0.00	-	0.00
2008_Sweeper_Diesel	5,630	0.00	0.02	0.03	0.00	0.00	0.00	5.29	0.00	-	0.00
2008_Man Lift_Diesel	6,045	0.01	0.03	0.06	0.00	0.00	0.00	5.68	0.00	-	0.00
2008_Side pick_Diesel	33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	-	0.00
2008_Side pick_Diesel	33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	-	0.00

Table B1-4. 2008 FEIR Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2008_Electric Wharf Crane_Electric	0.0043	-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	0.0043	0.05	2.92	0.32	0.01	0.01	-	112	0.01	-	-
2008_Forklift_LPG	0.0043	0.01	0.19	0.08	0.00	0.00	-	54	0.00	-	-
2008_Forklift_LPG	0.0043	0.01	0.14	0.09	0.00	0.00	-	5	0.00	-	-
2008_Forklift_LPG	0.0043	0.08	1.13	0.55	0.00	0.00	-	43	0.01	-	-
2008_Forklift_Diesel	0.0043	0.03	0.11	0.29	0.01	0.01	0.00	30	0.01	-	0.01
2008_Forklift_Diesel	0.0043	0.06	0	0.75	0.03	0.03	0.00	133	0.01	-	0.03
2008_Forklift_Diesel	0.0043	0.09	0.93	1.39	0.05	0.05	0.00	265.77	0.02	-	0.05
2008_Forklift_Diesel	0.0043	0.10	0.24	1.48	0.04	0.04	0.00	166.10	0.02	-	0.04
2008_Forklift_Diesel	0.0043	0.10	0.23	1.42	0.04	0.03	0.00	166.11	0.02	-	0.04
2008_Forklift_Diesel	0.0043	0.05	0.20	0.91	0.02	0.02	0.00	166.11	0.01	-	0.02
2008_Forklift_Diesel	0.0043	0.27	0.85	2.30	0.13	0.12	0.00	187.94	0.04	-	0.13
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.32	1.05	4.43	0.12	0.11	0.01	838.54	0.05	-	0.12
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.59	2.34	10.60	0.26	0.24	0.02	1,958.53	0.12	-	0.26
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.01	0.01	0.09	0.00	0.00	0.00	13.47	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.0043	1.62	5.47	23.20	0.64	0.59	0.05	4,478.45	0.22	-	0.64
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.00	0.01	0.03	0.00	0.00	0.00	2.10	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.00	0.00	0.01	0.00	0.00	0.00	0.42	0.00	-	0.00
2008_Top handler_Diesel	0.0043	0.16	0.38	8.02	0.14	0.13	0.01	921.05	0.09	-	0.14
2008_Top handler_Diesel	0.0043	1.52	3.45	71.59	1.34	1.23	0.09	7,762.78	0.68	-	1.34
2008_Top handler_Diesel	0.0043	1.50	4.09	35.93	1.83	1.68	0.02	2,118.64	0.43	-	1.83
2008_Top handler_Diesel	0.0043	0.76	2.63	36.51	0.68	0.63	0.07	6,741.15	0.26	-	0.68
2008_Yard tractor_LPG	0.0043	0.08	1.03	0.63	0.00	0.00	-	39.76	0.01	-	-
2008_Yard tractor_LPG	0.0043	14.59	340.83	77.42	0.93	0.93	-	10,470.29	1.58	-	-
2008_Yard tractor_LPG	0.0043	10.07	425.81	52.71	1.33	1.33	-	15,086.19	0.60	-	-
2008_Yard tractor_LPG	0.0043	2.23	33.74	14.91	0.84	0.84	-	9,519.53	0.30	-	-
2008_Truck_Diesel	0.0043	0.12	0.61	2.68	0.06	0.06	0.01	528.09	0.02	-	0.06
2008_Truck_Diesel	0.0043	0.02	0.15	0.39	0.01	0.01	0.00	140.82	0.00	-	0.01
2008_Sweeper_Diesel	0.0043	0.02	0.07	0.17	0.01	0.01	0.00	17.44	0.01	-	0.01
2008_Sweeper_Diesel	0.0043	0.02	0.17	0.27	0.01	0.01	0.00	45.18	0.00	-	0.01
2008_Man Lift_Diesel	0.0043	0.07	0.21	0.49	0.03	0.03	0.00	48.51	0.01	-	0.03
2008_Side pick_Diesel	0.0043	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00
2008_Side pick_Diesel	0.0043	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00

8hr/24hr Peaking Factor*: 0.619386395

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

Table B1-5. 2008 FEIR Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2008_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	0.03	1.81	0.20	0.01	0.01	-	69	0.01	-	-
2008_Forklift_LPG	0.01	0.12	0.05	0.00	0.00	-	33	0.00	-	-
2008_Forklift_LPG	0.01	0.09	0.05	0.00	0.00	-	3	0.00	-	-
2008_Forklift_LPG	0.05	0.70	0.34	0.00	0.00	-	27	0.01	-	-
2008_Forklift_Diesel	0.02	0.07	0.18	0.01	0.01	0.00	19	0.00	-	0.01
2008_Forklift_Diesel	0.04	0	0.47	0.02	0.02	0.00	82	0.01	-	0.02
2008_Forklift_Diesel	0.05	0.58	0.86	0.03	0.03	0.00	164.61	0.01	-	0.03
2008_Forklift_Diesel	0.06	0.15	0.91	0.02	0.02	0.00	102.88	0.01	-	0.02
2008_Forklift_Diesel	0.06	0.14	0.88	0.02	0.02	0.00	102.88	0.01	-	0.02
2008_Forklift_Diesel	0.03	0.13	0.57	0.01	0.01	0.00	102.88	0.01	-	0.01
2008_Forklift_Diesel	0.17	0.52	1.42	0.08	0.07	0.00	116.41	0.02	-	0.08
2008_Rub-trd Gantry Crane_Diesel	0.20	0.65	2.74	0.08	0.07	0.01	519.38	0.03	-	0.08
2008_Rub-trd Gantry Crane_Diesel	0.37	1.45	6.56	0.16	0.15	0.01	1,213.09	0.08	-	0.16
2008_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.06	0.00	0.00	0.00	8.34	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	1.01	3.39	14.37	0.39	0.36	0.03	2,773.89	0.14	-	0.39
2008_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.02	0.00	0.00	0.00	1.30	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00
2008_Top handler_Diesel	0.10	0.24	4.97	0.09	0.08	0.01	570.49	0.05	-	0.09
2008_Top handler_Diesel	0.94	2.14	44.34	0.83	0.76	0.05	4,808.16	0.42	-	0.83
2008_Top handler_Diesel	0.93	2.53	22.26	1.13	1.04	0.01	1,312.26	0.27	-	1.13
2008_Top handler_Diesel	0.47	1.63	22.62	0.42	0.39	0.04	4,175.38	0.16	-	0.42
2008_Yard tractor_LPG	0.05	0.64	0.39	0.00	0.00	-	24.63	0.01	-	-
2008_Yard tractor_LPG	9.04	211.10	47.95	0.57	0.57	-	6,485.16	0.98	-	-
2008_Yard tractor_LPG	6.23	263.74	32.65	0.83	0.83	-	9,344.18	0.37	-	-
2008_Yard tractor_LPG	1.38	20.90	9.24	0.52	0.52	-	5,896.27	0.18	-	-
2008_Truck_Diesel	0.08	0.38	1.66	0.04	0.04	0.00	327.09	0.02	-	0.04
2008_Truck_Diesel	0.01	0.10	0.24	0.01	0.01	0.00	87.23	0.00	-	0.01
2008_Sweeper_Diesel	0.01	0.05	0.11	0.01	0.01	0.00	10.80	0.00	-	0.01
2008_Sweeper_Diesel	0.01	0.11	0.16	0.01	0.01	0.00	27.98	0.00	-	0.01
2008_Man Lift_Diesel	0.04	0.13	0.31	0.02	0.02	0.00	30.05	0.01	-	0.02
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	-	0.00
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	-	0.00

1hr/24hr Peaking Factor*: 0.088599477
**Note: Using same peaking factor that is applied to trucks*

Table B1-6. 2008 FEIR Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2008_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	0.00	0.26	0.03	0.00	0.00	-	10	0.00	-	-
2008_Forklift_LPG	0.00	0.02	0.01	0.00	0.00	-	5	0.00	-	-
2008_Forklift_LPG	0.00	0.01	0.01	0.00	0.00	-	0	0.00	-	-
2008_Forklift_LPG	0.01	0.10	0.05	0.00	0.00	-	4	0.00	-	-
2008_Forklift_Diesel	0.00	0.01	0.03	0.00	0.00	0.00	3	0.00	-	0.00
2008_Forklift_Diesel	0.01	0	0.07	0.00	0.00	0.00	12	0.00	-	0.00
2008_Forklift_Diesel	0.01	0.08	0.12	0.00	0.00	0.00	23.55	0.00	-	0.00
2008_Forklift_Diesel	0.01	0.02	0.13	0.00	0.00	0.00	14.72	0.00	-	0.00
2008_Forklift_Diesel	0.01	0.02	0.13	0.00	0.00	0.00	14.72	0.00	-	0.00
2008_Forklift_Diesel	0.00	0.02	0.08	0.00	0.00	0.00	14.72	0.00	-	0.00
2008_Forklift_Diesel	0.02	0.08	0.20	0.01	0.01	0.00	16.65	0.00	-	0.01
2008_Rub-trd Gantry Crane_Diesel	0.03	0.09	0.39	0.01	0.01	0.00	74.29	0.00	-	0.01
2008_Rub-trd Gantry Crane_Diesel	0.05	0.21	0.94	0.02	0.02	0.00	173.52	0.01	-	0.02
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.01	0.00	0.00	0.00	1.19	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.14	0.48	2.06	0.06	0.05	0.00	396.79	0.02	-	0.06
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	-	0.00
2008_Top handler_Diesel	0.01	0.03	0.71	0.01	0.01	0.00	81.60	0.01	-	0.01
2008_Top handler_Diesel	0.13	0.31	6.34	0.12	0.11	0.01	687.78	0.06	-	0.12
2008_Top handler_Diesel	0.13	0.36	3.18	0.16	0.15	0.00	187.71	0.04	-	0.16
2008_Top handler_Diesel	0.07	0.23	3.23	0.06	0.06	0.01	597.26	0.02	-	0.06
2008_Yard tractor_LPG	0.01	0.09	0.06	0.00	0.00	-	3.52	0.00	-	-
2008_Yard tractor_LPG	1.29	30.20	6.86	0.08	0.08	-	927.66	0.14	-	-
2008_Yard tractor_LPG	0.89	37.73	4.67	0.12	0.12	-	1,336.63	0.05	-	-
2008_Yard tractor_LPG	0.20	2.99	1.32	0.07	0.07	-	843.43	0.03	-	-
2008_Truck_Diesel	0.01	0.05	0.24	0.01	0.01	0.00	46.79	0.00	-	0.01
2008_Truck_Diesel	0.00	0.01	0.03	0.00	0.00	0.00	12.48	0.00	-	0.00
2008_Sweeper_Diesel	0.00	0.01	0.02	0.00	0.00	0.00	1.55	0.00	-	0.00
2008_Sweeper_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	4.00	0.00	-	0.00
2008_Man Lift_Diesel	0.01	0.02	0.04	0.00	0.00	0.00	4.30	0.00	-	0.00
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-	0.00
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2012

Table B1-7. 2012 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	Emission Controls (% reduction) PM	HC	CO
Electric Wharf Crane		0			13		0%	-	0%	0%	0%
Forklift	160	2012	Diesel	0.3	3		0%	300	0%	0%	0%
Forklift	160	2012	Diesel	0.3	2		0%	226	0%	0%	0%
Forklift	160	2012	Diesel	0.3	1		0%	69	0%	0%	0%
Forklift	165	2012	Diesel	0.3	1		0%	8	0%	0%	0%
Forklift	165	2012	Diesel	0.3	2		0%	405	0%	0%	0%
Forklift	152	2012	Diesel	0.3	1		0%	113	0%	0%	0%
Forklift	152	2012	Diesel	0.3	1		0%	855	0%	0%	0%
Forklift	152	2012	Diesel	0.3	2		0%	1,005	0%	0%	0%
Forklift	153	2009	Diesel	0.3	1		0%	80	0%	0%	0%
Forklift	153	2009	Diesel	0.3	1		0%	-	0%	0%	0%
Forklift	153	2012	Diesel	0.3	1		0%	101	0%	0%	0%
Forklift	190	2012	Diesel	0.3	1		0%	447	0%	0%	0%
Forklift	137	2009	Diesel	0.3	2		0%	1,000	0%	0%	0%
Rub-trd Gantry Crane	685	0	Electric	0.2	5		0%	5,015	0%	0%	0%
Rub-trd Gantry Crane	685	0	Electric	0.2	3		0%	1,230	0%	0%	0%
Rub-trd Gantry Crane	612	0	Electric	0.2	8		0%	8,877	0%	0%	0%
Rub-trd Gantry Crane	454	0	Electric	0.2	2		0%	1,479	0%	0%	0%
Rub-trd Gantry Crane	197	0	Electric	0.2	1		0%	422	0%	0%	0%
Top handler	250	2009	Diesel	0.59	9		0%	7,016	0%	0%	0%
Top handler	260	2009	Diesel	0.59	6		0%	4,931	0%	0%	0%
Top handler	260	2009	Diesel	0.59	15		0%	18,722	0%	0%	0%
Top handler	260	2009	Diesel	0.59	6		0%	5,131	0%	0%	0%
Top handler	335	2011	Diesel	0.59	3		0%	2,109	0%	0%	0%
Yard tractor	174	2000	LPG	0.39	2		0%	344	0%	0%	0%
Yard tractor	195	2004	LPG	0.39	53		0%	37,114	0%	0%	0%
Yard tractor	195	2007	LPG	0.39	59		0%	50,429	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	40,350	0%	0%	0%
Yard tractor	231	2011	LPG	0.39	23		0%	12,319	0%	0%	0%
Sweeper	100	2012	Diesel	0.68	1		0%	-	0%	0%	0%
Sweeper	100	2012	Diesel	0.68	1		0%	604	0%	0%	0%
Truck	250	2005	Diesel	0.51	2		0%	678	0%	0%	0%
Truck	250	2008	Diesel	0.51	2		0%	1,089	0%	0%	0%
Truck	275	1993	Diesel	0.51	1		0%	-	0%	0%	0%
Truck	275	2001	Diesel	0.51	1		0%	179	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 ratic

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

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 B1-8. 2012 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2012_Electric Wharf Crane___0	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel_160_2012	0.101	2.720	2.160	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_160_2012	0.104	2.728	2.163	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_160_2012	0.098	2.710	2.156	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_165_2012	0.095	2.701	2.152	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_165_2012	0.104	2.729	2.163	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_152_2012	0.100	2.716	2.158	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_152_2012	0.133	2.820	2.199	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_152_2012	0.118	2.771	2.180	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_153_2009	0.122	2.745	2.342	0.117	0.108	0.010	852.433	0.046	-
2012_Forklift_Diesel_153_2009	0.105	2.700	2.323	0.112	0.103	0.010	852.433	0.046	-
2012_Forklift_Diesel_153_2012	0.099	2.714	2.158	0.009	0.008	0.010	852.461	0.021	-
2012_Forklift_Diesel_190_2012	0.091	0.941	1.304	0.009	0.008	0.010	852.437	0.017	-
2012_Forklift_Diesel_137_2009	0.212	2.990	2.446	0.144	0.133	0.010	852.433	0.046	-
2012_Rub-trd Gantry Crane_Electric_685_0	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric_685_0	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric_612_0	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric_454_0	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric_197_0	-	-	-	-	-	-	-	-	-
2012_Top handler_Diesel_250_2009	0.297	1.097	2.543	0.120	0.111	0.010	852.345	0.038	-
2012_Top handler_Diesel_260_2009	0.300	1.100	2.545	0.121	0.111	0.008	853.009	0.038	-
2012_Top handler_Diesel_260_2009	0.370	1.165	2.626	0.133	0.122	0.008	853.009	0.038	-
2012_Top handler_Diesel_260_2009	0.288	1.088	2.531	0.119	0.109	0.008	853.009	0.038	-
2012_Top handler_Diesel_335_2011	0.131	0.974	1.339	0.009	0.009	0.008	851.552	0.019	-
2012_Yard tractor_LPG_174_2000	1.536	20.278	10.966	0.060	0.060	-	674.859	0.244	-
2012_Yard tractor_LPG_195_2004	1.192	27.841	5.446	0.060	0.060	-	674.859	0.171	-
2012_Yard tractor_LPG_195_2007	1.204	25.324	4.252	0.060	0.060	-	674.859	0.050	-
2012_Yard tractor_LPG_195_2008	0.521	2.514	1.179	0.060	0.060	-	674.859	0.045	-
2012_Yard tractor_LPG_231_2011	0.063	8.265	0.398	0.060	0.060	-	674.859	0.027	-
2012_Sweeper_Diesel_100_2012	0.095	3.050	0.094	0.009	0.008	0.010	852.431	0.019	-
2012_Sweeper_Diesel_100_2012	0.122	3.146	0.096	0.009	0.008	0.010	852.431	0.019	-
2012_Truck_Diesel_250_2005	0.261	1.050	4.473	0.113	0.104	0.010	852.099	0.061	-
2012_Truck_Diesel_250_2008	0.264	1.066	2.504	0.115	0.106	0.010	851.926	0.043	-
2012_Truck_Diesel_275_1993	0.716	2.700	7.598	0.274	0.252	0.008	834.926	0.154	-
2012_Truck_Diesel_275_2001	0.403	1.022	6.504	0.147	0.135	0.008	849.903	0.069	-

Table B1-9. 2012 FEIR Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2012_Electric Wharf Crane_		-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	14,411	0.00	0.04	0.03	0.00	0.00	0.00	14	0.00	-	0.00
2012_Forklift_Diesel	10,845	0.00	0.03	0.03	0.00	0.00	0.00	10	0.00	-	0.00
2012_Forklift_Diesel	3,322	0.00	0.01	0.01	0.00	0.00	0.00	3	0.00	-	0.00
2012_Forklift_Diesel	378	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	-	0.00
2012_Forklift_Diesel	20,025	0.00	0.06	0.05	0.00	0.00	0.00	19	0.00	-	0.00
2012_Forklift_Diesel	5,151	0.00	0	0.01	0.00	0.00	0.00	5	0.00	-	0.00
2012_Forklift_Diesel	38,983	0.01	0.12	0.09	0.00	0.00	0.00	36.63	0.00	-	0.00
2012_Forklift_Diesel	45,828	0.01	0.14	0.11	0.00	0.00	0.00	43.06	0.00	-	0.00
2012_Forklift_Diesel	3,667	0.00	0.01	0.01	0.00	0.00	0.00	3.45	0.00	-	0.00
2012_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	4,648	0.00	0.01	0.01	0.00	0.00	0.00	4.37	0.00	-	0.00
2012_Forklift_Diesel	25,466	0.00	0.03	0.04	0.00	0.00	0.00	23.93	0.00	-	0.00
2012_Forklift_Diesel	41,117	0.01	0.14	0.11	0.01	0.01	0.00	38.63	0.00	-	0.01
2012_Rub-trd Gantry Crane_Electric	687,028	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	168,567	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	1,086,487	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	134,316	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	16,641	-	-	-	-	-	-	-	-	-	-
2012_Top handler_Diesel	1,034,806	0.34	1.25	2.90	0.14	0.13	0.01	972.23	0.04	-	0.14
2012_Top handler_Diesel	756,391	0.25	0.92	2.12	0.10	0.09	0.01	711.21	0.03	-	0.10
2012_Top handler_Diesel	2,872,020	1.17	3.69	8.31	0.42	0.39	0.03	2,700.46	0.12	-	0.42
2012_Top handler_Diesel	787,068	0.25	0.94	2.20	0.10	0.09	0.01	740.05	0.03	-	0.10
2012_Top handler_Diesel	416,786	0.06	0.45	0.62	0.00	0.00	0.00	391.22	0.01	-	0.00
2012_Yard tractor_LPG	23,343	0.04	0.52	0.28	0.00	0.00	-	17.36	0.01	-	-
2012_Yard tractor_LPG	2,822,527	3.71	86.62	16.94	0.19	0.19	-	2,099.66	0.53	-	-
2012_Yard tractor_LPG	3,835,117	5.09	107.06	17.97	0.25	0.25	-	2,852.92	0.21	-	-
2012_Yard tractor_LPG	3,068,651	1.76	8.50	3.99	0.20	0.20	-	2,282.75	0.15	-	-
2012_Yard tractor_LPG	1,109,814	0.08	10.11	0.49	0.07	0.07	-	825.58	0.03	-	-
2012_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	41,038	0.01	0.14	0.00	0.00	0.00	0.00	38.56	0.00	-	0.00
2012_Truck_Diesel	86,484	0.02	0.10	0.43	0.01	0.01	0.00	81.23	0.01	-	0.01
2012_Truck_Diesel	138,907	0.04	0.16	0.38	0.02	0.02	0.00	130.44	0.01	-	0.02
2012_Truck_Diesel	-	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	25,050	0.01	0.03	0.18	0.00	0.00	0.00	23.47	0.00	-	0.00

Table B1-10. 2012 FEIR Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2012_Electric Wharf Crane_	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.0040	0.01	0.35	0.27	0.00	0.00	0.00	108	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.01	0.26	0.21	0.00	0.00	0.00	81	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.00	0.08	0.06	0.00	0.00	0.00	25	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.00	0.01	0.01	0.00	0.00	0.00	3	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.02	0.48	0.38	0.00	0.00	0.00	150	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.00	0	0.10	0.00	0.00	0.00	39	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.05	0.97	0.75	0.00	0.00	0.00	292.56	0.01	-	0.00
2012_Forklift_Diesel	0.0040	0.05	1.12	0.88	0.00	0.00	0.00	343.93	0.01	-	0.00
2012_Forklift_Diesel	0.0040	0.00	0.09	0.08	0.00	0.00	0.00	27.52	0.00	-	0.00
2012_Forklift_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.0040	0.00	0.11	0.09	0.00	0.00	0.00	34.88	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.02	0.21	0.29	0.00	0.00	0.00	191.11	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.08	1.08	0.89	0.05	0.05	0.00	308.57	0.02	-	0.05
2012_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Top handler_Diesel	0.0040	2.71	10.00	23.16	1.10	1.01	0.09	7,764.95	0.34	-	1.10
2012_Top handler_Diesel	0.0040	2.00	7.32	16.95	0.80	0.74	0.06	5,680.20	0.25	-	0.80
2012_Top handler_Diesel	0.0040	9.37	29.45	66.40	3.36	3.09	0.21	21,567.78	0.95	-	3.36
2012_Top handler_Diesel	0.0040	1.99	7.54	17.54	0.82	0.76	0.06	5,910.58	0.26	-	0.82
2012_Top handler_Diesel	0.0040	0.48	3.57	4.91	0.03	0.03	0.03	3,124.56	0.07	-	0.03
2012_Yard tractor_LPG	0.0040	0.32	4.17	2.25	0.01	0.01	-	138.69	0.05	-	-
2012_Yard tractor_LPG	0.0040	29.63	691.82	135.32	1.48	1.48	-	16,769.33	4.25	-	-
2012_Yard tractor_LPG	0.0040	40.65	855.02	143.55	2.01	2.01	-	22,785.37	1.70	-	-
2012_Yard tractor_LPG	0.0040	14.08	67.91	31.85	1.61	1.61	-	18,231.61	1.20	-	-
2012_Yard tractor_LPG	0.0040	0.62	80.75	3.89	0.58	0.58	-	6,593.68	0.26	-	-
2012_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	0.0040	0.04	1.14	0.03	0.00	0.00	0.00	307.97	0.01	-	0.00
2012_Truck_Diesel	0.0040	0.20	0.80	3.41	0.09	0.08	0.01	648.77	0.05	-	0.09
2012_Truck_Diesel	0.0040	0.32	1.30	3.06	0.14	0.13	0.01	1,041.81	0.05	-	0.14
2012_Truck_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	0.0040	0.09	0.23	1.43	0.03	0.03	0.00	187.43	0.02	-	0.03

8hr/24hr Peaking Factor*: 0.491679278

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

Table B1-11. 2012 FEIR Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2012_Electric Wharf Crane_	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.01	0.17	0.13	0.00	0.00	0.00	53	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.13	0.10	0.00	0.00	0.00	40	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.04	0.03	0.00	0.00	0.00	12	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	1	0.00	-	0.00
2012_Forklift_Diesel	0.01	0.24	0.19	0.00	0.00	0.00	74	0.00	-	0.00
2012_Forklift_Diesel	0.00	0	0.05	0.00	0.00	0.00	19	0.00	-	0.00
2012_Forklift_Diesel	0.02	0.48	0.37	0.00	0.00	0.00	143.84	0.00	-	0.00
2012_Forklift_Diesel	0.02	0.55	0.43	0.00	0.00	0.00	169.10	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.04	0.04	0.00	0.00	0.00	13.53	0.00	-	0.00
2012_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.00	0.05	0.04	0.00	0.00	0.00	17.15	0.00	-	0.00
2012_Forklift_Diesel	0.01	0.10	0.14	0.00	0.00	0.00	93.97	0.00	-	0.00
2012_Forklift_Diesel	0.04	0.53	0.44	0.03	0.02	0.00	151.72	0.01	-	0.03
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Top handler_Diesel	1.33	4.92	11.39	0.54	0.50	0.04	3,817.86	0.17	-	0.54
2012_Top handler_Diesel	0.98	3.60	8.33	0.40	0.36	0.03	2,792.84	0.12	-	0.40
2012_Top handler_Diesel	4.61	14.48	32.65	1.65	1.52	0.10	10,604.43	0.47	-	1.65
2012_Top handler_Diesel	0.98	3.71	8.62	0.40	0.37	0.03	2,906.11	0.13	-	0.40
2012_Top handler_Diesel	0.24	1.76	2.42	0.02	0.02	0.02	1,536.28	0.03	-	0.02
2012_Yard tractor_LPG	0.16	2.05	1.11	0.01	0.01	-	68.19	0.02	-	-
2012_Yard tractor_LPG	14.57	340.15	66.53	0.73	0.73	-	8,245.13	2.09	-	-
2012_Yard tractor_LPG	19.99	420.40	70.58	0.99	0.99	-	11,203.10	0.84	-	-
2012_Yard tractor_LPG	6.92	33.39	15.66	0.79	0.79	-	8,964.11	0.59	-	-
2012_Yard tractor_LPG	0.30	39.70	1.91	0.29	0.29	-	3,241.98	0.13	-	-
2012_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	0.02	0.56	0.02	0.00	0.00	0.00	151.42	0.00	-	0.00
2012_Truck_Diesel	0.10	0.39	1.67	0.04	0.04	0.00	318.99	0.02	-	0.04
2012_Truck_Diesel	0.16	0.64	1.51	0.07	0.06	0.01	512.24	0.03	-	0.07
2012_Truck_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	0.04	0.11	0.71	0.02	0.01	0.00	92.16	0.01	-	0.02

1hr/24hr Peaking Factor*: 0.070264762

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

Table B1-12. 2012 FEIR Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2012_Electric Wharf Crane_	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	8	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.02	0.01	0.00	0.00	0.00	6	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	2	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.03	0.03	0.00	0.00	0.00	11	0.00	-	0.00
2012_Forklift_Diesel	0.00	0	0.01	0.00	0.00	0.00	3	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.07	0.05	0.00	0.00	0.00	20.56	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.08	0.06	0.00	0.00	0.00	24.17	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.01	0.01	0.00	0.00	0.00	1.93	0.00	-	0.00
2012_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.00	0.01	0.01	0.00	0.00	0.00	2.45	0.00	-	0.00
2012_Forklift_Diesel	0.00	0.01	0.02	0.00	0.00	0.00	13.43	0.00	-	0.00
2012_Forklift_Diesel	0.01	0.08	0.06	0.00	0.00	0.00	21.68	0.00	-	0.00
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2012_Top handler_Diesel	0.19	0.70	1.63	0.08	0.07	0.01	545.60	0.02	-	0.08
2012_Top handler_Diesel	0.14	0.51	1.19	0.06	0.05	0.00	399.12	0.02	-	0.06
2012_Top handler_Diesel	0.66	2.07	4.67	0.24	0.22	0.01	1,515.45	0.07	-	0.24
2012_Top handler_Diesel	0.14	0.53	1.23	0.06	0.05	0.00	415.31	0.02	-	0.06
2012_Top handler_Diesel	0.03	0.25	0.35	0.00	0.00	0.00	219.55	0.00	-	0.00
2012_Yard tractor_LPG	0.02	0.29	0.16	0.00	0.00	-	9.74	0.00	-	-
2012_Yard tractor_LPG	2.08	48.61	9.51	0.10	0.10	-	1,178.29	0.30	-	-
2012_Yard tractor_LPG	2.86	60.08	10.09	0.14	0.14	-	1,601.01	0.12	-	-
2012_Yard tractor_LPG	0.99	4.77	2.24	0.11	0.11	-	1,281.04	0.08	-	-
2012_Yard tractor_LPG	0.04	5.67	0.27	0.04	0.04	-	463.30	0.02	-	-
2012_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	0.00	0.08	0.00	0.00	0.00	0.00	21.64	0.00	-	0.00
2012_Truck_Diesel	0.01	0.06	0.24	0.01	0.01	0.00	45.59	0.00	-	0.01
2012_Truck_Diesel	0.02	0.09	0.22	0.01	0.01	0.00	73.20	0.00	-	0.01
2012_Truck_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	0.01	0.02	0.10	0.00	0.00	0.00	13.17	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2014

Table B1-13. 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

<u>Notes</u>

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

<u>Emissions Control Data</u>

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

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

Table B1-14. 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 B1-15. 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 B1-16. 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 B1-17. 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 B1-18. 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	2018

Table B1-19. 2018 FEIR Mitigated Scenario - CHE Equipment List

									Emission Controls (% reduction)		
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	PM	HC	CO
Forklift	137	2014	Diesel	0.3	1		0%	279	0%	0%	0%
Forklift	152	2014	Diesel	0.3	1		0%	808	0%	0%	0%
Forklift	152	2014	Diesel	0.3	2		0%	1,888	0%	0%	0%
Forklift	190	2014	Diesel	0.3	1		0%	880	0%	0%	0%
Forklift	160	2014	Diesel	0.3	2		0%	747	0%	0%	0%
Forklift	160	2014	Diesel	0.3	2		0%	187	0%	0%	0%
Forklift	165	2014	Diesel	0.3	2		0%	355	0%	0%	0%
Forklift	165	2014	Diesel	0.3	1		0%	309	0%	0%	0%
Rub-trd Gantry Crane	197	0	Electric	0.20	1		0%	969	0%	0%	0%
Rub-trd Gantry Crane	302	0	Electric	0.20	5		0%	8,494	0%	0%	0%
Rub-trd Gantry Crane	454	0	Electric	0.20	2		0%	3,791	0%	0%	0%
Rub-trd Gantry Crane	612	0	Electric	0.20	8		0%	8,506	0%	0%	0%
Rub-trd Gantry Crane	685	0	Electric	0.20	5		0%	7,575	0%	0%	0%
Top handler	250	2014	Diesel	0.59	8		0%	8,058	0%	0%	0%
Top handler	260	2014	Diesel	0.59	5		0%	5,435	0%	0%	0%
Top handler	260	2014	Diesel	0.59	6		0%	6,045	0%	0%	0%
Top handler	260	2014	Diesel	0.59	15		0%	30,362	0%	0%	0%
Top handler	335	2011	Diesel	0.59	3		0%	3,830	0%	0%	0%
Top handler	370	2014	Diesel	0.59	1		0%	1,092	0%	0%	0%
Yard tractor	195	2014	LNG	0.39	53		0%	43,664	0%	0%	0%
Yard tractor	195	2014	LNG	0.39	59		0%	72,374	0%	0%	0%
Yard tractor	195	2014	LNG	0.39	43		0%	55,530	0%	0%	0%
Yard tractor	231	2014	LNG	0.39	23		0%	22,528	0%	0%	0%
Sweeper	100	2014	Diesel	0.68	1		0%	845	0%	0%	0%
Truck	250	2005	Diesel	0.51	2	DPF	0%	1,222	85%	0%	0%
Truck	250	2008	Diesel	0.51	2		0%	1,764	0%	0%	0%
Truck	275	2001	Diesel	0.51	1	DPF	0%	684	85%	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 B1-20. 2018 FEIR Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2018_Forklift_Diesel_137_2014	0.139	2.840	2.207	0.009	0.009	0.010	852.448	0.046	-
2018_Forklift_Diesel_152_2014	0.224	3.104	2.311	0.011	0.010	0.010	852.448	0.046	-
2018_Forklift_Diesel_152_2014	0.247	3.175	2.339	0.011	0.010	0.010	852.448	0.046	-
2018_Forklift_Diesel_190_2014	0.129	1.070	0.277	0.010	0.010	0.010	852.441	0.025	-
2018_Forklift_Diesel_160_2014	0.155	2.890	2.226	0.010	0.009	0.010	852.448	0.046	-
2018_Forklift_Diesel_160_2014	0.116	2.766	2.178	0.009	0.008	0.010	852.448	0.046	-
2018_Forklift_Diesel_165_2014	0.152	2.878	2.222	0.010	0.009	0.010	852.448	0.046	-
2018_Forklift_Diesel_165_2014	0.144	2.855	2.213	0.009	0.009	0.010	852.448	0.046	-
2018_Rub-trd Gantry Crane_Electric_197_(	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric_302_(	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric_454_(	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric_612_(	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric_685_(	-	-	-	-	-	-	-	-	-
2018_Top handler_Diesel_250_2014	0.162	1.135	0.286	0.011	0.010	0.010	852.688	0.021	-
2018_Top handler_Diesel_260_2014	0.154	1.119	0.284	0.011	0.010	0.008	851.451	0.021	-
2018_Top handler_Diesel_260_2014	0.165	1.141	0.287	0.011	0.010	0.008	851.451	0.021	-
2018_Top handler_Diesel_260_2014	0.230	1.270	0.305	0.013	0.012	0.008	851.451	0.021	-
2018_Top handler_Diesel_335_2011	0.365	1.195	1.543	0.013	0.012	0.008	851.590	0.043	-
2018_Top handler_Diesel_370_2014	0.147	1.059	0.282	0.011	0.010	0.008	851.451	0.021	-
2018_Yard tractor_LNG_195_2014	0.138	1.088	0.279	0.011	0.010	0.010	852.493	0.031	-
2018_Yard tractor_LNG_195_2014	0.163	1.138	0.286	0.011	0.010	0.010	852.493	0.031	-
2018_Yard tractor_LNG_195_2014	0.174	1.158	0.289	0.012	0.011	0.010	852.493	0.031	-
2018_Yard tractor_LNG_231_2014	0.149	1.110	0.282	0.011	0.010	0.010	852.493	0.031	-
2018_Sweeper_Diesel_100_2014	0.230	3.530	0.102	0.011	0.010	0.010	852.468	0.038	-
2018_Truck_Diesel_250_2005	0.430	1.212	4.872	0.144	0.132	0.010	852.317	0.066	-
2018_Truck_Diesel_250_2008	0.464	1.251	2.733	0.148	0.137	0.010	852.132	0.065	-
2018_Truck_Diesel_275_2001	0.606	1.340	8.300	0.230	0.212	0.008	856.861	0.069	-

Table B1-21. 2018 FEIR Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2018_Forklift_Diesel	11,456	0.00	0.04	0.03	0.00	0.00	0.00	11	0.00	-	0.00
2018_Forklift_Diesel	36,831	0.01	0.13	0.09	0.00	0.00	0.00	35	0.00	-	0.00
2018_Forklift_Diesel	86,112	0.02	0.30	0.22	0.00	0.00	0.00	81	0.00	-	0.00
2018_Forklift_Diesel	50,183	0.01	0.06	0.02	0.00	0.00	0.00	47	0.00	-	0.00
2018_Forklift_Diesel	35,861	0.01	0.11	0.09	0.00	0.00	0.00	34	0.00	-	0.00
2018_Forklift_Diesel	8,965	0.00	0.03	0.02	0.00	0.00	0.00	8	0.00	-	0.00
2018_Forklift_Diesel	17,573	0.00	0	0.04	0.00	0.00	0.00	17	0.00	-	0.00
2018_Forklift_Diesel	15,315	0.00	0.05	0.04	0.00	0.00	0.00	14.39	0.00	-	0.00
2018_Rub-trd Gantry Crane_Electric	38,171	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	513,035	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	344,231	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	1,041,144	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	1,037,783	-	-	-	-	-	-	-	-	-	-
2018_Top handler_Diesel	1,188,613	0.21	1.49	0.37	0.01	0.01	0.01	1,117.19	0.03	-	0.01
2018_Top handler_Diesel	833,728	0.14	1.03	0.26	0.01	0.01	0.01	782.49	0.02	-	0.01
2018_Top handler_Diesel	927,227	0.17	1.17	0.29	0.01	0.01	0.01	870.25	0.02	-	0.01
2018_Top handler_Diesel	4,657,569	1.18	6.52	1.56	0.07	0.06	0.04	4,371.36	0.11	-	0.07
2018_Top handler_Diesel	756,918	0.30	1.00	1.29	0.01	0.01	0.01	710.52	0.04	-	0.01
2018_Top handler_Diesel	238,412	0.04	0.28	0.07	0.00	0.00	0.00	223.76	0.01	-	0.00
2018_Yard tractor_LNG	3,320,637	0.51	3.98	1.02	0.04	0.04	0.04	3,120.39	0.11	-	-
2018_Yard tractor_LNG	5,504,072	0.99	6.91	1.74	0.07	0.06	0.06	5,172.16	0.19	-	-
2018_Yard tractor_LNG	4,223,038	0.81	5.39	1.35	0.05	0.05	0.04	3,968.37	0.14	-	-
2018_Yard tractor_LNG	2,029,585	0.33	2.48	0.63	0.02	0.02	0.02	1,907.19	0.07	-	-
2018_Sweeper_Diesel	57,492	0.01	0.22	0.01	0.00	0.00	0.00	54.02	0.00	-	0.00
2018_Truck_Diesel	155,789	0.07	0.21	0.84	0.02	0.02	0.00	146.36	0.01	-	0.02
2018_Truck_Diesel	224,867	0.11	0.31	0.68	0.04	0.03	0.00	211.22	0.02	-	0.04
2018_Truck_Diesel	95,982	0.06	0.14	0.88	0.02	0.02	0.00	90.66	0.01	-	0.02

Table B1-22. 2018 FEIR Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	**Peak Day Factor**	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2018_Forklift_Diesel	0.0042	0.01	0.30	0.24	0.00	0.00	0.00	91	0.00	-	0.00
2018_Forklift_Diesel	0.0042	0.08	1.07	0.79	0.00	0.00	0.00	293	0.02	-	0.00
2018_Forklift_Diesel	0.0042	0.20	2.55	1.88	0.01	0.01	0.01	684	0.04	-	0.01
2018_Forklift_Diesel	0.0042	0.06	0.50	0.13	0.00	0.00	0.00	399	0.01	-	0.00
2018_Forklift_Diesel	0.0042	0.05	0.97	0.74	0.00	0.00	0.00	285	0.02	-	0.00
2018_Forklift_Diesel	0.0042	0.01	0.23	0.18	0.00	0.00	0.00	71	0.00	-	0.00
2018_Forklift_Diesel	0.0042	0.02	0	0.36	0.00	0.00	0.00	140	0.01	-	0.00
2018_Forklift_Diesel	0.0042	0.02	0.41	0.32	0.00	0.00	0.00	121.65	0.01	-	0.00
2018_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	0.0042	-	-	-	-	-	-	-	-	-	-
2018_Top handler_Diesel	0.0042	1.79	12.57	3.17	0.13	0.12	0.11	9,444.06	0.23	-	0.13
2018_Top handler_Diesel	0.0042	1.19	8.70	2.20	0.09	0.08	0.06	6,614.74	0.16	-	0.09
2018_Top handler_Diesel	0.0042	1.42	9.86	2.48	0.10	0.09	0.07	7,356.55	0.18	-	0.10
2018_Top handler_Diesel	0.0042	9.99	55.13	13.22	0.57	0.52	0.36	36,952.82	0.90	-	0.57
2018_Top handler_Diesel	0.0042	2.57	8.43	10.88	0.09	0.09	0.06	6,006.31	0.30	-	0.09
2018_Top handler_Diesel	0.0042	0.33	2.35	0.63	0.02	0.02	0.02	1,891.55	0.05	-	0.02
2018_Yard tractor_LNG	0.0042	4.27	33.68	8.64	0.33	0.30	0.30	26,377.92	0.96	-	-
2018_Yard tractor_LNG	0.0042	8.37	58.38	14.68	0.58	0.54	0.49	43,722.31	1.59	-	-
2018_Yard tractor_LNG	0.0042	6.83	45.58	11.38	0.46	0.42	0.38	33,546.25	1.22	-	-
2018_Yard tractor_LNG	0.0042	2.82	20.99	5.34	0.21	0.19	0.18	16,122.28	0.59	-	-
2018_Sweeper_Diesel	0.0042	0.12	1.89	0.05	0.01	0.01	0.01	456.68	0.02	-	0.01
2018_Truck_Diesel	0.0042	0.62	1.76	7.07	0.21	0.19	0.01	1,237.28	0.10	-	0.21
2018_Truck_Diesel	0.0042	0.97	2.62	5.73	0.31	0.29	0.02	1,785.51	0.14	-	0.31
2018_Truck_Diesel	0.0042	0.54	1.20	7.42	0.21	0.19	0.01	766.35	0.06	-	0.21

8hr/24hr Peaking Factor*: 0.493093632
**Note: Using same peaking factor that is applied to trucks*

Table B1-23. 2018 FEIR Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2018_Forklift_Diesel	0.01	0.15	0.12	0.00	0.00	0.00	45	0.00	-	0.00
2018_Forklift_Diesel	0.04	0.53	0.39	0.00	0.00	0.00	144	0.01	-	0.00
2018_Forklift_Diesel	0.10	1.26	0.93	0.00	0.00	0.00	337	0.02	-	0.00
2018_Forklift_Diesel	0.03	0.25	0.06	0.00	0.00	0.00	197	0.01	-	0.00
2018_Forklift_Diesel	0.03	0.48	0.37	0.00	0.00	0.00	140	0.01	-	0.00
2018_Forklift_Diesel	0.00	0.11	0.09	0.00	0.00	0.00	35	0.00	-	0.00
2018_Forklift_Diesel	0.01	0	0.18	0.00	0.00	0.00	69	0.00	-	0.00
2018_Forklift_Diesel	0.01	0.20	0.16	0.00	0.00	0.00	59.98	0.00	-	0.00
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Top handler_Diesel	0.88	6.20	1.56	0.06	0.06	0.05	4,656.81	0.11	-	0.06
2018_Top handler_Diesel	0.59	4.29	1.09	0.04	0.04	0.03	3,261.69	0.08	-	0.04
2018_Top handler_Diesel	0.70	4.86	1.22	0.05	0.04	0.04	3,627.47	0.09	-	0.05
2018_Top handler_Diesel	4.93	27.19	6.52	0.28	0.26	0.18	18,221.20	0.44	-	0.28
2018_Top handler_Diesel	1.27	4.16	5.37	0.05	0.04	0.03	2,961.68	0.15	-	0.05
2018_Top handler_Diesel	0.16	1.16	0.31	0.01	0.01	0.01	932.71	0.02	-	0.01
2018_Yard tractor_LNG	2.11	16.61	4.26	0.16	0.15	0.15	13,006.78	0.47	-	-
2018_Yard tractor_LNG	4.13	28.78	7.24	0.29	0.26	0.24	21,559.19	0.78	-	-
2018_Yard tractor_LNG	3.37	22.48	5.61	0.23	0.21	0.19	16,541.44	0.60	-	-
2018_Yard tractor_LNG	1.39	10.35	2.63	0.10	0.09	0.09	7,949.79	0.29	-	-
2018_Sweeper_Diesel	0.06	0.93	0.03	0.00	0.00	0.00	225.19	0.01	-	0.00
2018_Truck_Diesel	0.31	0.87	3.49	0.10	0.09	0.01	610.09	0.05	-	0.10
2018_Truck_Diesel	0.48	1.29	2.82	0.15	0.14	0.01	880.42	0.07	-	0.15
2018_Truck_Diesel	0.27	0.59	3.66	0.10	0.09	0.00	377.88	0.03	-	0.10

1hr/24hr Peaking Factor*: 0.070869965
**Note: Using same peaking factor that is applied to trucks*

Table B1-24. 2018 FEIR Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2018_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	6	0.00	-	0.00
2018_Forklift_Diesel	0.01	0.08	0.06	0.00	0.00	0.00	21	0.00	-	0.00
2018_Forklift_Diesel	0.01	0.18	0.13	0.00	0.00	0.00	48	0.00	-	0.00
2018_Forklift_Diesel	0.00	0.04	0.01	0.00	0.00	0.00	28	0.00	-	0.00
2018_Forklift_Diesel	0.00	0.07	0.05	0.00	0.00	0.00	20	0.00	-	0.00
2018_Forklift_Diesel	0.00	0.02	0.01	0.00	0.00	0.00	5	0.00	-	0.00
2018_Forklift_Diesel	0.00	0	0.03	0.00	0.00	0.00	10	0.00	-	0.00
2018_Forklift_Diesel	0.00	0.03	0.02	0.00	0.00	0.00	8.62	0.00	-	0.00
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Rub-trd Gantry Crane_Electric	-	-	-	-	-	-	-	-	-	-
2018_Top handler_Diesel	0.13	0.89	0.22	0.01	0.01	0.01	669.30	0.02	-	0.01
2018_Top handler_Diesel	0.08	0.62	0.16	0.01	0.01	0.00	468.79	0.01	-	0.01
2018_Top handler_Diesel	0.10	0.70	0.18	0.01	0.01	0.01	521.36	0.01	-	0.01
2018_Top handler_Diesel	0.71	3.91	0.94	0.04	0.04	0.03	2,618.85	0.06	-	0.04
2018_Top handler_Diesel	0.18	0.60	0.77	0.01	0.01	0.00	425.67	0.02	-	0.01
2018_Top handler_Diesel	0.02	0.17	0.04	0.00	0.00	0.00	134.05	0.00	-	0.00
2018_Yard tractor_LNG	0.30	2.39	0.61	0.02	0.02	0.02	1,869.40	0.07	-	-
2018_Yard tractor_LNG	0.59	4.14	1.04	0.04	0.04	0.03	3,098.60	0.11	-	-
2018_Yard tractor_LNG	0.48	3.23	0.81	0.03	0.03	0.03	2,377.42	0.09	-	-
2018_Yard tractor_LNG	0.20	1.49	0.38	0.01	0.01	0.01	1,142.59	0.04	-	-
2018_Sweeper_Diesel	0.01	0.13	0.00	0.00	0.00	0.00	32.37	0.00	-	0.00
2018_Truck_Diesel	0.04	0.12	0.50	0.01	0.01	0.00	87.69	0.01	-	0.01
2018_Truck_Diesel	0.07	0.19	0.41	0.02	0.02	0.00	126.54	0.01	-	0.02
2018_Truck_Diesel	0.04	0.08	0.53	0.01	0.01	0.00	54.31	0.00	-	0.01

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2023

Table B1-25. 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 B1-26. 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 B1-27. 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 B1-28. 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 B1-29. 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 B1-30. 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 B1-31. 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 B1-32. 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 B1-33. 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 B1-34. 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 B1-35. 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 B1-36. 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 B1-37. 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 B1-38. 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 B1-39. 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 B1-40. 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 B1-41. 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 B1-42. 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 B1-43. 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 B1-44. 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 B1-45. 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 B1-46. 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 B1-47. 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 B1-48. 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	2008

Table B1-49. 2008 Proposed Mitigated Scenario - CHE Equipment List

									Emission Controls (% reduction)		
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	PM	HC	CO
Electric Wharf Crane	(blank)	(blank)	Electric	(blank)	9		0%	-	0%	0%	0%
Forklift	160	2005	LPG	0.3	3		0%	366	0%	0%	0%
Forklift	160	2008	LPG	0.3	2		0%	176	0%	0%	0%
Forklift	165	1995	LPG	0.3	2		0%	17	0%	0%	0%
Forklift	165	2002	LPG	0.3	2		0%	138	0%	0%	0%
Forklift	152	1994	Diesel	0.3	1		0%	83	0%	0%	0%
Forklift	152	2004	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	152	2005	Diesel	0.3	2		0%	726	0%	0%	0%
Forklift	190	1997	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	190	1999	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	190	2004	Diesel	0.3	1		0%	363	0%	0%	0%
Forklift	215	1993	Diesel	0.3	1		0%	363	0%	0%	0%
Rub-trd Gantry Crane	454	2004	Diesel	0.2	2		0%	1,150	0%	0%	0%
Rub-trd Gantry Crane	612	2003	Diesel	0.2	8		0%	2,023	0%	0%	0%
Rub-trd Gantry Crane	685	1999	Diesel	0.2	1		0%	12	0%	0%	0%
Rub-trd Gantry Crane	685	2005	Diesel	0.2	6		0%	4,015	0%	0%	0%
Rub-trd Gantry Crane	180	1983	Diesel	0.2	2		0%	7	0%	0%	0%
Rub-trd Gantry Crane	180	1984	Diesel	0.2	1		0%	1	0%	0%	0%
Top handler	250	1997	Diesel	0.59	5	DOC	100%	778	30%	70%	70%
Top handler	250	2002	Diesel	0.59	9	DOC	100%	6,556	30%	70%	70%
Top handler	250	1990	Diesel	0.59	4	DOC	100%	1,786	30%	70%	70%
Top handler	260	2006	Diesel	0.59	6	DOC	100%	5,484	30%	70%	70%
Yard tractor	174	2000	LPG	0.39	2		0%	92	0%	0%	0%
Yard tractor	195	2004	LPG	0.39	53		0%	21,671	0%	0%	0%
Yard tractor	195	2007	LPG	0.39	59		0%	31,225	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	19,704	0%	0%	0%
Truck	250	2005	Diesel	0.51	2		0%	516	0%	0%	0%
Truck	250	2008	Diesel	0.51	1		0%	138	0%	0%	0%
Sweeper	100	1995	Diesel	0.68	1		0%	32	0%	0%	0%
Sweeper	100	2005	Diesel	0.68	1		0%	83	0%	0%	0%
Man Lift	80	1995	Diesel	0.51	2		0%	148	0%	0%	0%
Side pick	152	1990	Diesel	0.59	1	DOC	100%	0	30%	70%	70%
Side pick	152	1996	Diesel	0.59	1	DOC	100%	0	30%	70%	70%

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 B1-50. 2008 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**
Electric Wharf Crane_Electric_(blank)_(blank)	-	-	-	-	-	-	-	-	-
Forklift_LPG_160_2005	0.286	17.683	1.946	0.060	0.060	-	674.859	0.084	-
Forklift_LPG_160_2008	0.108	2.375	1.040	0.060	0.060	-	674.859	0.021	-
Forklift_LPG_165_1995	1.397	17.030	10.574	0.060	0.060	-	674.859	0.213	-
Forklift_LPG_165_2002	1.207	17.636	8.651	0.060	0.060	-	674.859	0.145	-
Forklift_Diesel_152_1994	0.830	2.945	8.202	0.342	0.315	0.010	852.465	0.172	-
Forklift_Diesel_152_2004	0.370	3.057	4.831	0.206	0.190	0.010	852.476	0.074	-
Forklift_Diesel_152_2005	0.277	2.986	4.454	0.166	0.152	0.010	852.445	0.056	-
Forklift_Diesel_190_1997	0.524	1.212	7.575	0.196	0.181	0.010	852.438	0.081	-
Forklift_Diesel_190_1999	0.493	1.163	7.300	0.184	0.169	0.010	852.453	0.081	-
Forklift_Diesel_190_2004	0.269	1.042	4.685	0.112	0.103	0.010	852.451	0.056	-
Forklift_Diesel_215_1993	1.247	3.842	10.410	0.592	0.544	0.010	852.372	0.172	-
Rub-trd Gantry Crane_Diesel_454_2004	0.323	1.064	4.503	0.125	0.115	0.008	852.735	0.047	-
Rub-trd Gantry Crane_Diesel_612_2003	0.253	1.002	4.546	0.110	0.101	0.008	840.339	0.053	-
Rub-trd Gantry Crane_Diesel_685_1999	0.341	0.926	5.959	0.122	0.112	0.009	845.926	0.073	-
Rub-trd Gantry Crane_Diesel_685_2005	0.313	1.057	4.482	0.123	0.113	0.009	864.986	0.042	-
Rub-trd Gantry Crane_Diesel_180_1983	1.006	4.340	10.314	0.406	0.374	0.010	853.645	0.238	-
Rub-trd Gantry Crane_Diesel_180_1984	0.994	4.311	10.254	0.399	0.367	0.010	853.026	0.238	-
Top handler_Diesel_250_1997	0.507	1.185	7.425	0.189	0.174	0.010	852.373	0.081	-
Top handler_Diesel_250_2002	0.557	1.263	7.865	0.210	0.193	0.010	852.779	0.074	-
Top handler_Diesel_250_1990	2.016	5.498	14.487	1.052	0.968	0.010	854.180	0.173	-
Top handler_Diesel_260_2006	0.319	1.106	4.610	0.123	0.113	0.008	851.207	0.032	-
Yard tractor_LPG_174_2000	1.417	17.506	10.632	0.060	0.060	-	674.859	0.215	-
Yard tractor_LPG_195_2004	0.941	21.968	4.990	0.060	0.060	-	674.859	0.102	-
Yard tractor_LPG_195_2007	0.450	19.048	2.358	0.060	0.060	-	674.859	0.027	-
Yard tractor_LPG_195_2008	0.158	2.392	1.057	0.060	0.060	-	674.859	0.021	-
Truck_Diesel_250_2005	0.201	0.991	4.328	0.102	0.093	0.010	852.036	0.040	-
Truck_Diesel_250_2008	0.115	0.929	2.334	0.090	0.083	0.010	852.493	0.022	-
Sweeper_Diesel_100_1995	1.102	3.604	8.369	0.541	0.498	0.010	852.463	0.251	-
Sweeper_Diesel_100_2005	0.323	3.216	5.021	0.247	0.228	0.010	852.435	0.069	-
Man Lift_Diesel_80_1995	1.182	3.757	8.681	0.601	0.553	0.010	852.460	0.251	-
Side pick_Diesel_152_1990	0.717	2.701	7.601	0.274	0.252	0.010	852.398	0.172	-
Side pick_Diesel_152_1996	0.716	2.701	7.600	0.274	0.252	0.010	852.414	0.172	-

Table B1-51. 2008 Proposed Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2008_Electric Wharf Crane_Electric		-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	17,570	0.01	0.34	0.04	0.00	0.00	-	13	0.00	-	-
2008_Forklift_LPG	8,471	0.00	0.02	0.01	0.00	0.00	-	6	0.00	-	-
2008_Forklift_LPG	863	0.00	0.02	0.01	0.00	0.00	-	1	0.00	-	-
2008_Forklift_LPG	6,813	0.01	0.13	0.06	0.00	0.00	-	5	0.00	-	-
2008_Forklift_Diesel	3,792	0.00	0.01	0.03	0.00	0.00	0.00	4	0.00	-	0.00
2008_Forklift_Diesel	16,559	0.01	0	0.09	0.00	0.00	0.00	16	0.00	-	0.00
2008_Forklift_Diesel	33,119	0.01	0.11	0.16	0.01	0.01	0.00	31.12	0.00	-	0.01
2008_Forklift_Diesel	20,699	0.01	0.03	0.17	0.00	0.00	0.00	19.45	0.00	-	0.00
2008_Forklift_Diesel	20,699	0.01	0.03	0.17	0.00	0.00	0.00	19.45	0.00	-	0.00
2008_Forklift_Diesel	20,699	0.01	0.02	0.11	0.00	0.00	0.00	19.45	0.00	-	0.00
2008_Forklift_Diesel	23,423	0.03	0.10	0.27	0.02	0.01	0.00	22.01	0.00	-	0.02
2008_Rub-trd Gantry Crane_Diesel	104,460	0.04	0.12	0.52	0.01	0.01	0.00	98.19	0.01	-	0.01
2008_Rub-trd Gantry Crane_Diesel	247,580	0.07	0.27	1.24	0.03	0.03	0.00	229.33	0.01	-	0.03
2008_Rub-trd Gantry Crane_Diesel	1,692	0.00	0.00	0.01	0.00	0.00	0.00	1.58	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	549,995	0.19	0.64	2.72	0.07	0.07	0.01	524.40	0.03	-	0.07
2008_Rub-trd Gantry Crane_Diesel	261	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	52	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	-	0.00
2008_Top handler_Diesel	114,787	0.02	0.04	0.94	0.02	0.02	0.00	107.85	0.01	-	0.02
2008_Top handler_Diesel	966,988	0.18	0.40	8.38	0.16	0.14	0.01	908.98	0.08	-	0.16
2008_Top handler_Diesel	263,481	0.18	0.48	4.21	0.21	0.20	0.00	248.08	0.05	-	0.21
2008_Top handler_Diesel	841,278	0.09	0.31	4.28	0.08	0.07	0.01	789.35	0.03	-	0.08
2008_Yard tractor_LPG	6,259	0.01	0.12	0.07	0.00	0.00	-	4.66	0.00	-	-
2008_Yard tractor_LPG	1,648,109	1.71	39.91	9.07	0.11	0.11	-	1,226.02	0.18	-	-
2008_Yard tractor_LPG	2,374,689	1.18	49.86	6.17	0.16	0.16	-	1,766.51	0.07	-	-
2008_Yard tractor_LPG	1,498,452	0.26	3.95	1.75	0.10	0.10	-	1,114.69	0.03	-	-
2008_Truck_Diesel	65,840	0.01	0.07	0.31	0.01	0.01	0.00	61.84	0.00	-	0.01
2008_Truck_Diesel	17,548	0.00	0.02	0.05	0.00	0.00	0.00	16.49	0.00	-	0.00
2008_Sweeper_Diesel	2,173	0.00	0.01	0.02	0.00	0.00	0.00	2.04	0.00	-	0.00
2008_Sweeper_Diesel	5,630	0.00	0.02	0.03	0.00	0.00	0.00	5.29	0.00	-	0.00
2008_Man Lift_Diesel	6,045	0.01	0.03	0.06	0.00	0.00	0.00	5.68	0.00	-	0.00
2008_Side pick_Diesel	33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	-	0.00
2008_Side pick_Diesel	33	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	-	0.00

Table B1-52. 2008 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2008_Electric Wharf Crane_Electric	0.0043	-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	0.0043	0.05	2.92	0.32	0.01	0.01	-	112	0.01	-	-
2008_Forklift_LPG	0.0043	0.01	0.19	0.08	0.00	0.00	-	54	0.00	-	-
2008_Forklift_LPG	0.0043	0.01	0.14	0.09	0.00	0.00	-	5	0.00	-	-
2008_Forklift_LPG	0.0043	0.08	1.13	0.55	0.00	0.00	-	43	0.01	-	-
2008_Forklift_Diesel	0.0043	0.03	0.11	0.29	0.01	0.01	0.00	30	0.01	-	0.01
2008_Forklift_Diesel	0.0043	0.06	0	0.75	0.03	0.03	0.00	133	0.01	-	0.03
2008_Forklift_Diesel	0.0043	0.09	0.93	1.39	0.05	0.05	0.00	265.77	0.02	-	0.05
2008_Forklift_Diesel	0.0043	0.10	0.24	1.48	0.04	0.04	0.00	166.10	0.02	-	0.04
2008_Forklift_Diesel	0.0043	0.10	0.23	1.42	0.04	0.03	0.00	166.11	0.02	-	0.04
2008_Forklift_Diesel	0.0043	0.05	0.20	0.91	0.02	0.02	0.00	166.11	0.01	-	0.02
2008_Forklift_Diesel	0.0043	0.27	0.85	2.30	0.13	0.12	0.00	187.94	0.04	-	0.13
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.32	1.05	4.43	0.12	0.11	0.01	838.54	0.05	-	0.12
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.59	2.34	10.60	0.26	0.24	0.02	1,958.53	0.12	-	0.26
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.01	0.01	0.09	0.00	0.00	0.00	13.47	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.0043	1.62	5.47	23.20	0.64	0.59	0.05	4,478.45	0.22	-	0.64
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.00	0.01	0.03	0.00	0.00	0.00	2.10	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.0043	0.00	0.00	0.01	0.00	0.00	0.00	0.42	0.00	-	0.00
2008_Top handler_Diesel	0.0043	0.16	0.38	8.02	0.14	0.13	0.01	921.05	0.09	-	0.14
2008_Top handler_Diesel	0.0043	1.52	3.45	71.59	1.34	1.23	0.09	7,762.78	0.68	-	1.34
2008_Top handler_Diesel	0.0043	1.50	4.09	35.93	1.83	1.68	0.02	2,118.64	0.43	-	1.83
2008_Top handler_Diesel	0.0043	0.76	2.63	36.51	0.68	0.63	0.07	6,741.15	0.26	-	0.68
2008_Yard tractor_LPG	0.0043	0.08	1.03	0.63	0.00	0.00	-	39.76	0.01	-	-
2008_Yard tractor_LPG	0.0043	14.59	340.83	77.42	0.93	0.93	-	10,470.29	1.58	-	-
2008_Yard tractor_LPG	0.0043	10.07	425.81	52.71	1.33	1.33	-	15,086.19	0.60	-	-
2008_Yard tractor_LPG	0.0043	2.23	33.74	14.91	0.84	0.84	-	9,519.53	0.30	-	-
2008_Truck_Diesel	0.0043	0.12	0.61	2.68	0.06	0.06	0.01	528.09	0.02	-	0.06
2008_Truck_Diesel	0.0043	0.02	0.15	0.39	0.01	0.01	0.00	140.82	0.00	-	0.01
2008_Sweeper_Diesel	0.0043	0.02	0.07	0.17	0.01	0.01	0.00	17.44	0.01	-	0.01
2008_Sweeper_Diesel	0.0043	0.02	0.17	0.27	0.01	0.01	0.00	45.18	0.00	-	0.01
2008_Man Lift_Diesel	0.0043	0.07	0.21	0.49	0.03	0.03	0.00	48.51	0.01	-	0.03
2008_Side pick_Diesel	0.0043	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00
2008_Side pick_Diesel	0.0043	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00

8hr/24hr Peaking Factor*: 0.619386395
**Note: Using same peaking factor that is applied to trucks*

Table B1-53. 2008 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2008_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	0.03	1.81	0.20	0.01	0.01	-	69	0.01	-	-
2008_Forklift_LPG	0.01	0.12	0.05	0.00	0.00	-	33	0.00	-	-
2008_Forklift_LPG	0.01	0.09	0.05	0.00	0.00	-	3	0.00	-	-
2008_Forklift_LPG	0.05	0.70	0.34	0.00	0.00	-	27	0.01	-	-
2008_Forklift_Diesel	0.02	0.07	0.18	0.01	0.01	0.00	19	0.00	-	0.01
2008_Forklift_Diesel	0.04	0	0.47	0.02	0.02	0.00	82	0.01	-	0.02
2008_Forklift_Diesel	0.05	0.58	0.86	0.03	0.03	0.00	164.61	0.01	-	0.03
2008_Forklift_Diesel	0.06	0.15	0.91	0.02	0.02	0.00	102.88	0.01	-	0.02
2008_Forklift_Diesel	0.06	0.14	0.88	0.02	0.02	0.00	102.88	0.01	-	0.02
2008_Forklift_Diesel	0.03	0.13	0.57	0.01	0.01	0.00	102.88	0.01	-	0.01
2008_Forklift_Diesel	0.17	0.52	1.42	0.08	0.07	0.00	116.41	0.02	-	0.08
2008_Rub-trd Gantry Crane_Diesel	0.20	0.65	2.74	0.08	0.07	0.01	519.38	0.03	-	0.08
2008_Rub-trd Gantry Crane_Diesel	0.37	1.45	6.56	0.16	0.15	0.01	1,213.09	0.08	-	0.16
2008_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.06	0.00	0.00	0.00	8.34	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	1.01	3.39	14.37	0.39	0.36	0.03	2,773.89	0.14	-	0.39
2008_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.02	0.00	0.00	0.00	1.30	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	-	0.00
2008_Top handler_Diesel	0.10	0.24	4.97	0.09	0.08	0.01	570.49	0.05	-	0.09
2008_Top handler_Diesel	0.94	2.14	44.34	0.83	0.76	0.05	4,808.16	0.42	-	0.83
2008_Top handler_Diesel	0.93	2.53	22.26	1.13	1.04	0.01	1,312.26	0.27	-	1.13
2008_Top handler_Diesel	0.47	1.63	22.62	0.42	0.39	0.04	4,175.38	0.16	-	0.42
2008_Yard tractor_LPG	0.05	0.64	0.39	0.00	0.00	-	24.63	0.01	-	-
2008_Yard tractor_LPG	9.04	211.10	47.95	0.57	0.57	-	6,485.16	0.98	-	-
2008_Yard tractor_LPG	6.23	263.74	32.65	0.83	0.83	-	9,344.18	0.37	-	-
2008_Yard tractor_LPG	1.38	20.90	9.24	0.52	0.52	-	5,896.27	0.18	-	-
2008_Truck_Diesel	0.08	0.38	1.66	0.04	0.04	0.00	327.09	0.02	-	0.04
2008_Truck_Diesel	0.01	0.10	0.24	0.01	0.01	0.00	87.23	0.00	-	0.01
2008_Sweeper_Diesel	0.01	0.05	0.11	0.01	0.01	0.00	10.80	0.00	-	0.01
2008_Sweeper_Diesel	0.01	0.11	0.16	0.01	0.01	0.00	27.98	0.00	-	0.01
2008_Man Lift_Diesel	0.04	0.13	0.31	0.02	0.02	0.00	30.05	0.01	-	0.02
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	-	0.00
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	-	0.00

1hr/24hr Peaking Factor*: 0.088599477

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

Table B1-54. 2008 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2008_Electric Wharf Crane_Electric	-	-	-	-	-	-	-	-	-	-
2008_Forklift_LPG	0.00	0.26	0.03	0.00	0.00	-	10	0.00	-	-
2008_Forklift_LPG	0.00	0.02	0.01	0.00	0.00	-	5	0.00	-	-
2008_Forklift_LPG	0.00	0.01	0.01	0.00	0.00	-	0	0.00	-	-
2008_Forklift_LPG	0.01	0.10	0.05	0.00	0.00	-	4	0.00	-	-
2008_Forklift_Diesel	0.00	0.01	0.03	0.00	0.00	0.00	3	0.00	-	0.00
2008_Forklift_Diesel	0.01	0	0.07	0.00	0.00	0.00	12	0.00	-	0.00
2008_Forklift_Diesel	0.01	0.08	0.12	0.00	0.00	0.00	23.55	0.00	-	0.00
2008_Forklift_Diesel	0.01	0.02	0.13	0.00	0.00	0.00	14.72	0.00	-	0.00
2008_Forklift_Diesel	0.01	0.02	0.13	0.00	0.00	0.00	14.72	0.00	-	0.00
2008_Forklift_Diesel	0.00	0.02	0.08	0.00	0.00	0.00	14.72	0.00	-	0.00
2008_Forklift_Diesel	0.02	0.08	0.20	0.01	0.01	0.00	16.65	0.00	-	0.01
2008_Rub-trd Gantry Crane_Diesel	0.03	0.09	0.39	0.01	0.01	0.00	74.29	0.00	-	0.01
2008_Rub-trd Gantry Crane_Diesel	0.05	0.21	0.94	0.02	0.02	0.00	173.52	0.01	-	0.02
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.01	0.00	0.00	0.00	1.19	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.14	0.48	2.06	0.06	0.05	0.00	396.79	0.02	-	0.06
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.00	-	0.00
2008_Rub-trd Gantry Crane_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	-	0.00
2008_Top handler_Diesel	0.01	0.03	0.71	0.01	0.01	0.00	81.60	0.01	-	0.01
2008_Top handler_Diesel	0.13	0.31	6.34	0.12	0.11	0.01	687.78	0.06	-	0.12
2008_Top handler_Diesel	0.13	0.36	3.18	0.16	0.15	0.00	187.71	0.04	-	0.16
2008_Top handler_Diesel	0.07	0.23	3.23	0.06	0.06	0.01	597.26	0.02	-	0.06
2008_Yard tractor_LPG	0.01	0.09	0.06	0.00	0.00	-	3.52	0.00	-	-
2008_Yard tractor_LPG	1.29	30.20	6.86	0.08	0.08	-	927.66	0.14	-	-
2008_Yard tractor_LPG	0.89	37.73	4.67	0.12	0.12	-	1,336.63	0.05	-	-
2008_Yard tractor_LPG	0.20	2.99	1.32	0.07	0.07	-	843.43	0.03	-	-
2008_Truck_Diesel	0.01	0.05	0.24	0.01	0.01	0.00	46.79	0.00	-	0.01
2008_Truck_Diesel	0.00	0.01	0.03	0.00	0.00	0.00	12.48	0.00	-	0.00
2008_Sweeper_Diesel	0.00	0.01	0.02	0.00	0.00	0.00	1.55	0.00	-	0.00
2008_Sweeper_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	4.00	0.00	-	0.00
2008_Man Lift_Diesel	0.01	0.02	0.04	0.00	0.00	0.00	4.30	0.00	-	0.00
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-	0.00
2008_Side pick_Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2012

Table B1-55. 2012 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	Emission Controls (% reduction) PM	HC	CO
Electric Wharf Crane					13		0%	-	0%	0%	0%
Forklift	160	2005	LPG	0.3	3		0%	300	0%	0%	0%
Forklift	160	2008	LPG	0.3	2		0%	226	0%	0%	0%
Forklift	160	2011	LPG	0.3	1		0%	69	0%	0%	0%
Forklift	165	1995	LPG	0.3	1		0%	8	0%	0%	0%
Forklift	165	2002	LPG	0.3	2		0%	405	0%	0%	0%
Forklift	152	1994	Diesel	0.3	1		0%	113	0%	0%	0%
Forklift	152	2004	Diesel	0.3	1		0%	855	0%	0%	0%
Forklift	152	2005	Diesel	0.3	2		0%	1,005	0%	0%	0%
Forklift	153	1979	Diesel	0.3	1		0%	80	0%	0%	0%
Forklift	153	1988	Diesel	0.3	1		0%	-	0%	0%	0%
Forklift	153	2009	Diesel	0.3	1		0%	101	0%	0%	0%
Forklift	190	2004	Diesel	0.3	1		0%	447	0%	0%	0%
Forklift	137	2007	Diesel	0.3	2		0%	1,000	0%	0%	0%
Rub-trd Gantry Crane	685	2005	Diesel	0.2	5		0%	5,015	0%	0%	0%
Rub-trd Gantry Crane	685	1999	Diesel	0.2	3		0%	1,230	0%	0%	0%
Rub-trd Gantry Crane	612	2003	Diesel	0.2	8		0%	8,877	0%	0%	0%
Rub-trd Gantry Crane	454	2004	Diesel	0.2	2		0%	1,479	0%	0%	0%
Rub-trd Gantry Crane	197	2011	Diesel	0.2	1		0%	422	0%	0%	0%
Top handler	250	2002	Diesel	0.59	9	DOC	100%	7,016	30%	70%	70%
Top handler	260	2007	Diesel	0.59	6	DOC	100%	4,931	30%	70%	70%
Top handler	260	2008	Diesel	0.59	15		0%	18,722	0%	0%	0%
Top handler	260	2006	Diesel	0.59	6	DOC	100%	5,131	30%	70%	70%
Top handler	335	2011	Diesel	0.59	3		0%	2,109	0%	0%	0%
Yard tractor	174	2000	LPG	0.39	2		0%	344	0%	0%	0%
Yard tractor	195	2004	LPG	0.39	53		0%	37,114	0%	0%	0%
Yard tractor	195	2007	LPG	0.39	59		0%	50,429	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	40,350	0%	0%	0%
Yard tractor	231	2011	LPG	0.39	23		0%	12,319	0%	0%	0%
Sweeper	100	1995	Diesel	0.68	1		0%	-	0%	0%	0%
Sweeper	100	2005	Diesel	0.68	1		0%	604	0%	0%	0%
Truck	250	2005	Diesel	0.51	2		0%	678	0%	0%	0%
Truck	250	2008	Diesel	0.51	2		0%	1,089	0%	0%	0%
Truck	275	1993	Diesel	0.51	1		0%	-	0%	0%	0%
Truck	275	2001	Diesel	0.51	1		0%	179	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 B1-56. 2012 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2012_Electric Wharf Crane_Electric_(blank)	-	-	-	-	-	-	-	-	-
2012_Forklift_LPG_160_2005	0.371	18.388	2.159	0.060	0.060	-	674.859	0.154	-
2012_Forklift_LPG_160_2008	0.185	2.401	1.066	0.060	0.060	-	674.859	0.045	-
2012_Forklift_LPG_160_2011	0.034	3.079	0.323	0.060	0.060	-	674.859	0.027	-
2012_Forklift_LPG_165_1995	1.383	16.706	10.535	0.060	0.060	-	674.859	0.250	-
2012_Forklift_LPG_165_2002	1.321	20.279	8.925	0.060	0.060	-	674.859	0.171	-
2012_Forklift_Diesel_152_1994	0.856	3.001	8.339	0.357	0.329	0.010	852.452	0.172	-
2012_Forklift_Diesel_152_2004	0.650	3.780	5.552	0.315	0.290	0.010	852.464	0.087	-
2012_Forklift_Diesel_152_2005	0.384	3.268	4.697	0.203	0.187	0.010	852.472	0.076	-
2012_Forklift_Diesel_153_1979	1.313	5.019	12.540	0.550	0.506	0.010	849.579	0.172	-
2012_Forklift_Diesel_153_1988	0.716	2.700	7.598	0.274	0.252	0.010	849.579	0.172	-
2012_Forklift_Diesel_153_2009	0.126	2.757	2.347	0.118	0.109	0.010	852.433	0.046	-
2012_Forklift_Diesel_190_2004	0.339	1.112	4.883	0.126	0.116	0.010	852.465	0.068	-
2012_Forklift_Diesel_137_2007	0.266	3.135	2.507	0.161	0.148	0.010	852.463	0.060	-
2012_Rub-trd Gantry Crane_Diesel_685_20	0.559	1.237	5.027	0.169	0.155	0.009	862.808	0.063	-
2012_Rub-trd Gantry Crane_Diesel_685_19	0.538	1.230	7.602	0.228	0.210	0.009	846.468	0.073	-
2012_Rub-trd Gantry Crane_Diesel_612_20	0.701	1.351	5.694	0.202	0.186	0.008	834.560	0.065	-
2012_Rub-trd Gantry Crane_Diesel_454_20	0.451	1.158	4.787	0.149	0.137	0.008	852.430	0.066	-
2012_Rub-trd Gantry Crane_Diesel_197_20	0.106	0.960	1.317	0.009	0.008	0.010	852.461	0.020	-
2012_Top handler_Diesel_250_2002	0.650	1.408	8.685	0.248	0.228	0.010	852.137	0.081	-
2012_Top handler_Diesel_260_2007	0.397	1.189	2.657	0.137	0.126	0.008	851.715	0.048	-
2012_Top handler_Diesel_260_2008	0.437	1.226	2.702	0.144	0.132	0.008	849.650	0.043	-
2012_Top handler_Diesel_260_2006	0.433	1.215	4.880	0.144	0.133	0.008	851.683	0.054	-
2012_Top handler_Diesel_335_2011	0.131	0.974	1.339	0.009	0.009	0.008	851.552	0.019	-
2012_Yard tractor_LPG_174_2000	1.536	20.278	10.966	0.060	0.060	-	674.859	0.244	-
2012_Yard tractor_LPG_195_2004	1.192	27.841	5.446	0.060	0.060	-	674.859	0.171	-
2012_Yard tractor_LPG_195_2007	1.204	25.324	4.252	0.060	0.060	-	674.859	0.050	-
2012_Yard tractor_LPG_195_2008	0.521	2.514	1.179	0.060	0.060	-	674.859	0.045	-
2012_Yard tractor_LPG_231_2011	0.063	8.265	0.398	0.060	0.060	-	674.859	0.027	-
2012_Sweeper_Diesel_100_1995	1.042	3.490	8.138	0.497	0.457	0.010	852.394	0.251	-
2012_Sweeper_Diesel_100_2005	0.587	3.930	5.704	0.393	0.361	0.010	852.479	0.092	-
2012_Truck_Diesel_250_2005	0.261	1.050	4.473	0.113	0.104	0.010	852.099	0.061	-
2012_Truck_Diesel_250_2008	0.264	1.066	2.504	0.115	0.106	0.010	851.926	0.043	-
2012_Truck_Diesel_275_1993	0.716	2.700	7.598	0.274	0.252	0.008	834.926	0.154	-
2012_Truck_Diesel_275_2001	0.403	1.022	6.504	0.147	0.135	0.008	849.903	0.069	-

Table B1-57. 2012 Proposed Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2012_Electric Wharf Crane_		-	-	-	-	-	-	-	-	-	-
2012_Forklift_LPG	14,411	0.01	0.29	0.03	0.00	0.00	-	11	0.00	-	-
2012_Forklift_LPG	10,845	0.00	0.03	0.01	0.00	0.00	-	8	0.00	-	-
2012_Forklift_LPG	3,322	0.00	0.01	0.00	0.00	0.00	-	2	0.00	-	-
2012_Forklift_LPG	378	0.00	0.01	0.00	0.00	0.00	-	0	0.00	-	-
2012_Forklift_LPG	20,025	0.03	0.45	0.20	0.00	0.00	-	15	0.00	-	-
2012_Forklift_Diesel	5,151	0.00	0.02	0.05	0.00	0.00	0.00	5	0.00	-	0.00
2012_Forklift_Diesel	38,983	0.03	0.16	0.24	0.01	0.01	0.00	37	0.00	-	0.01
2012_Forklift_Diesel	45,828	0.02	0.17	0.24	0.01	0.01	0.00	43	0.00	-	0.01
2012_Forklift_Diesel	3,667	0.01	0.02	0.05	0.00	0.00	0.00	3	0.00	-	0.00
2012_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	4,648	0.00	0.01	0.01	0.00	0.00	0.00	4	0.00	-	0.00
2012_Forklift_Diesel	25,466	0.01	0.03	0.14	0.00	0.00	0.00	24	0.00	-	0.00
2012_Forklift_Diesel	41,117	0.01	0.14	0.11	0.01	0.01	0.00	39	0.00	-	0.01
2012_Rub-trd Gantry Crane_Diesel	687,028	0.42	0.94	3.81	0.13	0.12	0.01	653	0.05	-	0.13
2012_Rub-trd Gantry Crane_Diesel	168,567	0.10	0.23	1.41	0.04	0.04	0.00	157	0.01	-	0.04
2012_Rub-trd Gantry Crane_Diesel	1,086,487	0.84	1.62	6.82	0.24	0.22	0.01	999	0.08	-	0.24
2012_Rub-trd Gantry Crane_Diesel	134,316	0.07	0.17	0.71	0.02	0.02	0.00	126	0.01	-	0.02
2012_Rub-trd Gantry Crane_Diesel	16,641	0.00	0.02	0.02	0.00	0.00	0.00	16	0.00	-	0.00
2012_Top handler_Diesel	1,034,806	0.22	0.48	9.91	0.20	0.18	0.01	972	0.09	-	0.20
2012_Top handler_Diesel	756,391	0.10	0.30	2.22	0.08	0.07	0.01	710	0.04	-	0.08
2012_Top handler_Diesel	2,872,020	1.38	3.88	8.55	0.46	0.42	0.03	2,690	0.14	-	0.46
2012_Top handler_Diesel	787,068	0.11	0.32	4.23	0.09	0.08	0.01	739	0.05	-	0.09
2012_Top handler_Diesel	416,786	0.06	0.45	0.62	0.00	0.00	0.00	391	0.01	-	0.00
2012_Yard tractor_LPG	23,343	0.04	0.52	0.28	0.00	0.00	-	17	0.01	-	-
2012_Yard tractor_LPG	2,822,527	3.71	86.62	16.94	0.19	0.19	-	2,100	0.53	-	-
2012_Yard tractor_LPG	3,835,117	5.09	107.06	17.97	0.25	0.25	-	2,853	0.21	-	-
2012_Yard tractor_LPG	3,068,651	1.76	8.50	3.99	0.20	0.20	-	2,283	0.15	-	-
2012_Yard tractor_LPG	1,109,814	0.08	10.11	0.49	0.07	0.07	-	826	0.03	-	-
2012_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	41,038	0.03	0.18	0.26	0.02	0.02	0.00	39	0.00	-	0.02
2012_Truck_Diesel	86,484	0.02	0.10	0.43	0.01	0.01	0.00	81	0.01	-	0.01
2012_Truck_Diesel	138,907	0.04	0.16	0.38	0.02	0.02	0.00	130	0.01	-	0.02
2012_Truck_Diesel	-	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	25,050	0.01	0.03	0.18	0.00	0.00	0.00	23	0.00	-	0.00

Table B1-58. 2012 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2012_Electric Wharf Crane_	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Forklift_LPG	0.0040	0.05	2.33	0.27	0.01	0.01	-	86	0.02	-	-
2012_Forklift_LPG	0.0040	0.02	0.23	0.10	0.01	0.01	-	64	0.00	-	-
2012_Forklift_LPG	0.0040	0.00	0.09	0.01	0.00	0.00	-	20	0.00	-	-
2012_Forklift_LPG	0.0040	0.00	0.06	0.04	0.00	0.00	-	2	0.00	-	-
2012_Forklift_LPG	0.0040	0.23	3.57	1.57	0.01	0.01	-	119	0.03	-	-
2012_Forklift_Diesel	0.0040	0.04	0	0.38	0.02	0.01	0.00	39	0.01	-	0.02
2012_Forklift_Diesel	0.0040	0.22	1.30	1.91	0.11	0.10	0.00	292.56	0.03	-	0.11
2012_Forklift_Diesel	0.0040	0.15	1.32	1.89	0.08	0.08	0.00	343.93	0.03	-	0.08
2012_Forklift_Diesel	0.0040	0.04	0.16	0.40	0.02	0.02	0.00	27.43	0.01	-	0.02
2012_Forklift_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.0040	0.01	0.11	0.10	0.00	0.00	0.00	34.88	0.00	-	0.00
2012_Forklift_Diesel	0.0040	0.08	0.25	1.09	0.03	0.03	0.00	191.12	0.02	-	0.03
2012_Forklift_Diesel	0.0040	0.10	1.13	0.91	0.06	0.05	0.00	308.58	0.02	-	0.06
2012_Rub-trd Gantry Crane_Diesel	0.0040	3.38	7.48	30.40	1.02	0.94	0.05	5,218.58	0.38	-	1.02
2012_Rub-trd Gantry Crane_Diesel	0.0040	0.80	1.82	11.28	0.34	0.31	0.01	1,256.17	0.11	-	0.34
2012_Rub-trd Gantry Crane_Diesel	0.0040	6.71	12.92	54.47	1.93	1.78	0.08	7,982.63	0.62	-	1.93
2012_Rub-trd Gantry Crane_Diesel	0.0040	0.53	1.37	5.66	0.18	0.16	0.01	1,007.98	0.08	-	0.18
2012_Rub-trd Gantry Crane_Diesel	0.0040	0.02	0.14	0.19	0.00	0.00	0.00	124.88	0.00	-	0.00
2012_Top handler_Diesel	0.0040	1.78	3.85	79.12	1.58	1.45	0.09	7,763.05	0.74	-	1.58
2012_Top handler_Diesel	0.0040	0.79	2.38	17.69	0.64	0.59	0.06	5,671.59	0.32	-	0.64
2012_Top handler_Diesel	0.0040	11.04	31.00	68.32	3.64	3.35	0.21	21,482.86	1.09	-	3.64
2012_Top handler_Diesel	0.0040	0.90	2.52	33.81	0.70	0.64	0.06	5,901.39	0.37	-	0.70
2012_Top handler_Diesel	0.0040	0.48	3.57	4.91	0.03	0.03	0.03	3,124.56	0.07	-	0.03
2012_Yard tractor_LPG	0.0040	0.32	4.17	2.25	0.01	0.01	-	138.69	0.05	-	-
2012_Yard tractor_LPG	0.0040	29.63	691.82	135.32	1.48	1.48	-	16,769.33	4.25	-	-
2012_Yard tractor_LPG	0.0040	40.65	855.02	143.55	2.01	2.01	-	22,785.37	1.70	-	-
2012_Yard tractor_LPG	0.0040	14.08	67.91	31.85	1.61	1.61	-	18,231.61	1.20	-	-
2012_Yard tractor_LPG	0.0040	0.62	80.75	3.89	0.58	0.58	-	6,593.68	0.26	-	-
2012_Sweeper_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	0.0040	0.21	1.42	2.06	0.14	0.13	0.00	307.99	0.03	-	0.14
2012_Truck_Diesel	0.0040	0.20	0.80	3.41	0.09	0.08	0.01	648.77	0.05	-	0.09
2012_Truck_Diesel	0.0040	0.32	1.30	3.06	0.14	0.13	0.01	1,041.81	0.05	-	0.14
2012_Truck_Diesel	0.0040	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	0.0040	0.09	0.23	1.43	0.03	0.03	0.00	187.43	0.02	-	0.03

8hr/24hr Peaking Factor*: 0.491679278

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

Table B1-59. 2012 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2012_Electric Wharf Crane_	-	-	-	-	-	-	-	-	-	-
2012_Forklift_LPG	0.02	1.15	0.13	0.00	0.00	-	42	0.01	-	-
2012_Forklift_LPG	0.01	0.11	0.05	0.00	0.00	-	32	0.00	-	-
2012_Forklift_LPG	0.00	0.04	0.00	0.00	0.00	-	10	0.00	-	-
2012_Forklift_LPG	0.00	0.03	0.02	0.00	0.00	-	1	0.00	-	-
2012_Forklift_LPG	0.11	1.76	0.77	0.01	0.01	-	58	0.01	-	-
2012_Forklift_Diesel	0.02	0	0.19	0.01	0.01	0.00	19	0.00	-	0.01
2012_Forklift_Diesel	0.11	0.64	0.94	0.05	0.05	0.00	143.84	0.01	-	0.05
2012_Forklift_Diesel	0.08	0.65	0.93	0.04	0.04	0.00	169.10	0.02	-	0.04
2012_Forklift_Diesel	0.02	0.08	0.20	0.01	0.01	0.00	13.49	0.00	-	0.01
2012_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.00	0.06	0.05	0.00	0.00	0.00	17.15	0.00	-	0.00
2012_Forklift_Diesel	0.04	0.12	0.54	0.01	0.01	0.00	93.97	0.01	-	0.01
2012_Forklift_Diesel	0.05	0.56	0.45	0.03	0.03	0.00	151.72	0.01	-	0.03
2012_Rub-trd Gantry Crane_Diesel	1.66	3.68	14.95	0.50	0.46	0.03	2,565.87	0.19	-	0.50
2012_Rub-trd Gantry Crane_Diesel	0.39	0.90	5.55	0.17	0.15	0.01	617.63	0.05	-	0.17
2012_Rub-trd Gantry Crane_Diesel	3.30	6.35	26.78	0.95	0.88	0.04	3,924.89	0.30	-	0.95
2012_Rub-trd Gantry Crane_Diesel	0.26	0.67	2.78	0.09	0.08	0.00	495.60	0.04	-	0.09
2012_Rub-trd Gantry Crane_Diesel	0.01	0.07	0.09	0.00	0.00	0.00	61.40	0.00	-	0.00
2012_Top handler_Diesel	0.87	1.89	38.90	0.78	0.71	0.04	3,816.93	0.36	-	0.78
2012_Top handler_Diesel	0.39	1.17	8.70	0.31	0.29	0.03	2,788.60	0.16	-	0.31
2012_Top handler_Diesel	5.43	15.24	33.59	1.79	1.65	0.10	10,562.68	0.53	-	1.79
2012_Top handler_Diesel	0.44	1.24	16.62	0.34	0.32	0.03	2,901.59	0.18	-	0.34
2012_Top handler_Diesel	0.24	1.76	2.42	0.02	0.02	0.02	1,536.28	0.03	-	0.02
2012_Yard tractor_LPG	0.16	2.05	1.11	0.01	0.01	-	68.19	0.02	-	-
2012_Yard tractor_LPG	14.57	340.15	66.53	0.73	0.73	-	8,245.13	2.09	-	-
2012_Yard tractor_LPG	19.99	420.40	70.58	0.99	0.99	-	11,203.10	0.84	-	-
2012_Yard tractor_LPG	6.92	33.39	15.66	0.79	0.79	-	8,964.11	0.59	-	-
2012_Yard tractor_LPG	0.30	39.70	1.91	0.29	0.29	-	3,241.98	0.13	-	-
2012_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	0.10	0.70	1.01	0.07	0.06	0.00	151.43	0.02	-	0.07
2012_Truck_Diesel	0.10	0.39	1.67	0.04	0.04	0.00	318.99	0.02	-	0.04
2012_Truck_Diesel	0.16	0.64	1.51	0.07	0.06	0.01	512.24	0.03	-	0.07
2012_Truck_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	0.04	0.11	0.71	0.02	0.01	0.00	92.16	0.01	-	0.02

1hr/24hr Peaking Factor*: 0.070264762

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

Table B1-60. 2012 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2012_Electric Wharf Crane_	-	-	-	-	-	-	-	-	-	-
2012_Forklift_LPG	0.00	0.16	0.02	0.00	0.00	-	6	0.00	-	-
2012_Forklift_LPG	0.00	0.02	0.01	0.00	0.00	-	5	0.00	-	-
2012_Forklift_LPG	0.00	0.01	0.00	0.00	0.00	-	1	0.00	-	-
2012_Forklift_LPG	0.00	0.00	0.00	0.00	0.00	-	0	0.00	-	-
2012_Forklift_LPG	0.02	0.25	0.11	0.00	0.00	-	8	0.00	-	-
2012_Forklift_Diesel	0.00	0	0.03	0.00	0.00	0.00	3	0.00	-	0.00
2012_Forklift_Diesel	0.02	0.09	0.13	0.01	0.01	0.00	20.56	0.00	-	0.01
2012_Forklift_Diesel	0.01	0.09	0.13	0.01	0.01	0.00	24.17	0.00	-	0.01
2012_Forklift_Diesel	0.00	0.01	0.03	0.00	0.00	0.00	1.93	0.00	-	0.00
2012_Forklift_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Forklift_Diesel	0.00	0.01	0.01	0.00	0.00	0.00	2.45	0.00	-	0.00
2012_Forklift_Diesel	0.01	0.02	0.08	0.00	0.00	0.00	13.43	0.00	-	0.00
2012_Forklift_Diesel	0.01	0.08	0.06	0.00	0.00	0.00	21.68	0.00	-	0.00
2012_Rub-trd Gantry Crane_Diesel	0.24	0.53	2.14	0.07	0.07	0.00	366.68	0.03	-	0.07
2012_Rub-trd Gantry Crane_Diesel	0.06	0.13	0.79	0.02	0.02	0.00	88.26	0.01	-	0.02
2012_Rub-trd Gantry Crane_Diesel	0.47	0.91	3.83	0.14	0.13	0.01	560.90	0.04	-	0.14
2012_Rub-trd Gantry Crane_Diesel	0.04	0.10	0.40	0.01	0.01	0.00	70.83	0.01	-	0.01
2012_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.01	0.00	0.00	0.00	8.78	0.00	-	0.00
2012_Top handler_Diesel	0.12	0.27	5.56	0.11	0.10	0.01	545.47	0.05	-	0.11
2012_Top handler_Diesel	0.06	0.17	1.24	0.04	0.04	0.00	398.51	0.02	-	0.04
2012_Top handler_Diesel	0.78	2.18	4.80	0.26	0.24	0.01	1,509.49	0.08	-	0.26
2012_Top handler_Diesel	0.06	0.18	2.38	0.05	0.05	0.00	414.66	0.03	-	0.05
2012_Top handler_Diesel	0.03	0.25	0.35	0.00	0.00	0.00	219.55	0.00	-	0.00
2012_Yard tractor_LPG	0.02	0.29	0.16	0.00	0.00	-	9.74	0.00	-	-
2012_Yard tractor_LPG	2.08	48.61	9.51	0.10	0.10	-	1,178.29	0.30	-	-
2012_Yard tractor_LPG	2.86	60.08	10.09	0.14	0.14	-	1,601.01	0.12	-	-
2012_Yard tractor_LPG	0.99	4.77	2.24	0.11	0.11	-	1,281.04	0.08	-	-
2012_Yard tractor_LPG	0.04	5.67	0.27	0.04	0.04	-	463.30	0.02	-	-
2012_Sweeper_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Sweeper_Diesel	0.01	0.10	0.14	0.01	0.01	0.00	21.64	0.00	-	0.01
2012_Truck_Diesel	0.01	0.06	0.24	0.01	0.01	0.00	45.59	0.00	-	0.01
2012_Truck_Diesel	0.02	0.09	0.22	0.01	0.01	0.00	73.20	0.00	-	0.01
2012_Truck_Diesel	-	-	-	-	-	-	-	-	-	-
2012_Truck_Diesel	0.01	0.02	0.10	0.00	0.00	0.00	13.17	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2014

Table B1-61. 2014 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	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 B1-62. 2014 Proposed 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_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 B1-63. 2014 Proposed Mitigated 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 B1-64. 2014 Proposed Mitigated 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 B1-65. 2014 Proposed Mitigated 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 B1-66. 2014 Proposed Mitigated 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	2018

Table B1-67. 2018 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	Emission Controls (% reduction) PM	HC	CO
Forklift	137	2007	Diesel	0.3	1	DPF	100%	279	85%	0%	0%
Forklift	152	2004	Diesel	0.3	1	DPF	100%	808	85%	0%	0%
Forklift	152	2005	Diesel	0.3	2	DPF	100%	1,888	85%	0%	0%
Forklift	190	2004	Diesel	0.3	1	DPF	100%	880	85%	0%	0%
Forklift	160	2005	LPG	0.3	2		0%	747	0%	0%	0%
Forklift	160	2008	LPG	0.3	2		0%	187	0%	0%	0%
Forklift	165	2002	LPG	0.3	2		0%	355	0%	0%	0%
Forklift	165	2011	LPG	0.3	1		0%	309	0%	0%	0%
Rub-trd Gantry Crane	197	2011	Diesel	0.20	1		0%	969	0%	0%	0%
Rub-trd Gantry Crane	302	2015	Diesel	0.20	5		0%	8,494	0%	0%	0%
Rub-trd Gantry Crane	454	2004	Diesel	0.20	2	Rypos,ULSD	100%	3,791	50%	78%	98%
Rub-trd Gantry Crane	612	2003	Diesel	0.20	8	Rypos,ULSD	100%	8,506	50%	78%	98%
Rub-trd Gantry Crane	685	2005	Diesel	0.20	5	Rypos,ULSD	100%	7,575	50%	78%	98%
Top handler	250	2002	Diesel	0.59	8	DPF	100%	8,058	85%	0%	0%
Top handler	260	2006	Diesel	0.59	5	DPF	100%	5,435	85%	0%	0%
Top handler	260	2007	Diesel	0.59	6	DPF	100%	6,045	85%	0%	0%
Top handler	260	2008	Diesel	0.59	15	DPF	100%	30,362	85%	0%	0%
Top handler	335	2011	Diesel	0.59	3		0%	3,830	0%	0%	0%
Top handler	370	2014	Diesel	0.59	1		0%	1,092	0%	0%	0%
Yard tractor	195	2004	LPG	0.39	53		0%	43,664	0%	0%	0%
Yard tractor	195	2007	LPG	0.39	59		0%	72,374	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	55,530	0%	0%	0%
Yard tractor	231	2011	LPG	0.39	23		0%	22,528	0%	0%	0%
Sweeper	100	2005	Diesel	0.68	1		0%	845	0%	0%	0%
Truck	250	2005	Diesel	0.51	2	DPF	100%	1,222	85%	0%	0%
Truck	250	2008	Diesel	0.51	2		0%	1,764	0%	0%	0%
Truck	275	2001	Diesel	0.51	1	DPF	100%	684	85%	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 B1-68. 2018 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2018_Forklift_Diesel_137_2007	0.229	3.035	2.465	0.150	0.138	0.010	852.447	0.065	-
2018_Forklift_Diesel_152_2004	0.702	3.913	5.686	0.336	0.309	0.010	852.340	0.087	-
2018_Forklift_Diesel_152_2005	0.672	4.030	5.350	0.304	0.280	0.010	852.376	0.076	-
2018_Forklift_Diesel_190_2004	0.596	1.370	5.612	0.177	0.163	0.010	852.538	0.068	-
2018_Forklift_LPG_160_2005	0.913	22.904	3.521	0.060	0.060	-	674.859	0.257	-
2018_Forklift_LPG_160_2008	0.188	2.402	1.067	0.060	0.060	-	674.859	0.080	-
2018_Forklift_LPG_165_2002	1.472	23.796	9.288	0.060	0.060	-	674.859	0.257	-
2018_Forklift_LPG_165_2011	0.081	11.407	0.443	0.060	0.060	-	674.859	0.062	-
2018_Rub-trd Gantry Crane_Diesel_197_20	0.283	1.184	1.472	0.012	0.011	0.010	852.429	0.045	-
2018_Rub-trd Gantry Crane_Diesel_302_20	0.172	1.096	0.289	0.012	0.011	0.008	852.556	0.019	-
2018_Rub-trd Gantry Crane_Diesel_454_20	1.126	1.652	6.283	0.274	0.252	0.008	852.639	0.066	-
2018_Rub-trd Gantry Crane_Diesel_612_20	0.824	1.447	6.009	0.228	0.209	0.008	830.002	0.064	-
2018_Rub-trd Gantry Crane_Diesel_685_20	0.883	1.474	5.745	0.229	0.211	0.009	849.629	0.065	-
2018_Top handler_Diesel_250_2002	0.806	1.651	10.058	0.311	0.287	0.010	852.454	0.081	-
2018_Top handler_Diesel_260_2006	0.665	1.438	5.432	0.187	0.172	0.008	852.474	0.065	-
2018_Top handler_Diesel_260_2007	0.680	1.450	2.980	0.185	0.170	0.008	851.398	0.065	-
2018_Top handler_Diesel_260_2008	0.940	1.691	3.279	0.229	0.211	0.008	849.902	0.065	-
2018_Top handler_Diesel_335_2011	0.365	1.195	1.543	0.013	0.012	0.008	851.590	0.043	-
2018_Top handler_Diesel_370_2014	0.147	1.059	0.282	0.011	0.010	0.008	851.451	0.021	-
2018_Yard tractor_LPG_195_2004	1.476	34.457	5.959	0.060	0.060	-	674.859	0.257	-
2018_Yard tractor_LPG_195_2007	2.380	35.114	7.206	0.060	0.060	-	674.859	0.086	-
2018_Yard tractor_LPG_195_2008	1.057	2.693	1.358	0.060	0.060	-	674.859	0.080	-
2018_Yard tractor_LPG_231_2011	0.215	34.896	0.779	0.060	0.060	-	674.859	0.062	-
2018_Sweeper_Diesel_100_2005	0.805	4.523	6.271	0.514	0.473	0.010	852.462	0.103	-
2018_Truck_Diesel_250_2005	0.430	1.212	4.872	0.144	0.132	0.010	852.317	0.066	-
2018_Truck_Diesel_250_2008	0.464	1.251	2.733	0.148	0.137	0.010	852.132	0.065	-
2018_Truck_Diesel_275_2001	0.606	1.340	8.300	0.230	0.212	0.008	856.861	0.069	-

Table B1-69. 2018 Proposed Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2018_Forklift_Diesel	11,456	0.00	0.04	0.03	0.00	0.00	0.00	11	0.00	-	0.00
2018_Forklift_Diesel	36,831	0.03	0.16	0.23	0.00	0.00	0.00	35	0.00	-	0.00
2018_Forklift_Diesel	86,112	0.06	0.38	0.51	0.00	0.00	0.00	81	0.01	-	0.00
2018_Forklift_Diesel	50,183	0.03	0.08	0.31	0.00	0.00	0.00	47	0.00	-	0.00
2018_Forklift_LPG	35,861	0.04	0.91	0.14	0.00	0.00	-	27	0.01	-	-
2018_Forklift_LPG	8,965	0.00	0.02	0.01	0.00	0.00	-	7	0.00	-	-
2018_Forklift_LPG	17,573	0.03	0	0.18	0.00	0.00	-	13	0.00	-	-
2018_Forklift_LPG	15,315	0.00	0.19	0.01	0.00	0.00	-	11.39	0.00	-	-
2018_Rub-trd Gantry Crane_Diesel	38,171	0.01	0.05	0.06	0.00	0.00	0.00	35.87	0.00	-	0.00
2018_Rub-trd Gantry Crane_Diesel	513,035	0.10	0.62	0.16	0.01	0.01	0.00	482.13	0.01	-	0.01
2018_Rub-trd Gantry Crane_Diesel	344,231	0.09	0.01	2.38	0.05	0.05	0.00	323.53	0.02	-	0.05
2018_Rub-trd Gantry Crane_Diesel	1,041,144	0.21	0.03	6.90	0.13	0.12	0.01	952.55	0.07	-	0.13
2018_Rub-trd Gantry Crane_Diesel	1,037,783	0.22	0.03	6.57	0.13	0.12	0.01	971.92	0.07	-	0.13
2018_Top handler_Diesel	1,188,613	1.06	2.16	13.18	0.06	0.06	0.01	1,116.88	0.11	-	0.06
2018_Top handler_Diesel	833,728	0.61	1.32	4.99	0.03	0.02	0.01	783.43	0.06	-	0.03
2018_Top handler_Diesel	927,227	0.69	1.48	3.05	0.03	0.03	0.01	870.19	0.07	-	0.03
2018_Top handler_Diesel	4,657,569	4.83	8.68	16.83	0.18	0.16	0.04	4,363.40	0.33	-	0.18
2018_Top handler_Diesel	756,918	0.30	1.00	1.29	0.01	0.01	0.01	710.52	0.04	-	0.01
2018_Top handler_Diesel	238,412	0.04	0.28	0.07	0.00	0.00	0.00	223.76	0.01	-	0.00
2018_Yard tractor_LPG	3,320,637	5.40	126.12	21.81	0.22	0.22	-	2,470.20	0.94	-	-
2018_Yard tractor_LPG	5,504,072	14.44	213.04	43.72	0.36	0.36	-	4,094.44	0.52	-	-
2018_Yard tractor_LPG	4,223,038	4.92	12.54	6.32	0.28	0.28	-	3,141.49	0.37	-	-
2018_Yard tractor_LPG	2,029,585	0.48	78.07	1.74	0.13	0.13	-	1,509.79	0.14	-	-
2018_Sweeper_Diesel	57,492	0.05	0.29	0.40	0.03	0.03	0.00	54.02	0.01	-	0.03
2018_Truck_Diesel	155,789	0.07	0.21	0.84	0.00	0.00	0.00	146.36	0.01	-	0.00
2018_Truck_Diesel	224,867	0.11	0.31	0.68	0.04	0.03	0.00	211.22	0.02	-	0.04
2018_Truck_Diesel	95,982	0.06	0.14	0.88	0.00	0.00	0.00	90.66	0.01	-	0.00

Table B1-70. 2018 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2018_Forklift_Diesel	0.0042	0.02	0.32	0.26	0.00	0.00	0.00	91	0.01	-	0.00
2018_Forklift_Diesel	0.0042	0.24	1.34	1.95	0.02	0.02	0.00	293	0.03	-	0.02
2018_Forklift_Diesel	0.0042	0.54	3.23	4.29	0.04	0.03	0.01	684	0.06	-	0.04
2018_Forklift_Diesel	0.0042	0.28	0.64	2.62	0.01	0.01	0.00	399	0.03	-	0.01
2018_Forklift_LPG	0.0042	0.31	7.65	1.18	0.02	0.02	-	226	0.09	-	-
2018_Forklift_LPG	0.0042	0.02	0.20	0.09	0.00	0.00	-	56	0.01	-	-
2018_Forklift_LPG	0.0042	0.24	4	1.52	0.01	0.01	-	111	0.04	-	-
2018_Forklift_LPG	0.0042	0.01	1.63	0.06	0.01	0.01	-	96.31	0.01	-	-
2018_Rub-trd Gantry Crane_Diesel	0.0042	0.10	0.42	0.52	0.00	0.00	0.00	303.19	0.02	-	0.00
2018_Rub-trd Gantry Crane_Diesel	0.0042	0.82	5.24	1.38	0.06	0.05	0.04	4,075.67	0.09	-	0.06
2018_Rub-trd Gantry Crane_Diesel	0.0042	0.79	0.11	20.15	0.44	0.40	0.03	2,734.92	0.21	-	0.44
2018_Rub-trd Gantry Crane_Diesel	0.0042	1.76	0.28	58.30	1.10	1.02	0.08	8,052.28	0.62	-	1.10
2018_Rub-trd Gantry Crane_Diesel	0.0042	1.88	0.29	55.55	1.11	1.02	0.08	8,216.07	0.63	-	1.11
2018_Top handler_Diesel	0.0042	8.92	18.28	111.40	0.52	0.48	0.11	9,441.47	0.90	-	0.52
2018_Top handler_Diesel	0.0042	5.17	11.17	42.20	0.22	0.20	0.07	6,622.68	0.51	-	0.22
2018_Top handler_Diesel	0.0042	5.87	12.53	25.75	0.24	0.22	0.07	7,356.09	0.56	-	0.24
2018_Top handler_Diesel	0.0042	40.81	73.38	142.30	1.49	1.37	0.36	36,885.60	2.82	-	1.49
2018_Top handler_Diesel	0.0042	2.57	8.43	10.88	0.09	0.09	0.06	6,006.31	0.30	-	0.09
2018_Top handler_Diesel	0.0042	0.33	2.35	0.63	0.02	0.02	0.02	1,891.55	0.05	-	0.02
2018_Yard tractor_LPG	0.0042	45.68	1,066.17	184.38	1.85	1.85	-	20,881.57	7.96	-	-
2018_Yard tractor_LPG	0.0042	122.04	1,800.93	369.56	3.06	3.06	-	34,611.93	4.40	-	-
2018_Yard tractor_LPG	0.0042	41.60	105.98	53.45	2.35	2.35	-	26,556.25	3.15	-	-
2018_Yard tractor_LPG	0.0042	4.07	659.96	14.74	1.13	1.13	-	12,762.89	1.18	-	-
2018_Sweeper_Diesel	0.0042	0.43	2.42	3.36	0.28	0.25	0.01	456.68	0.05	-	0.28
2018_Truck_Diesel	0.0042	0.62	1.76	7.07	0.03	0.03	0.01	1,237.28	0.10	-	0.03
2018_Truck_Diesel	0.0042	0.97	2.62	5.73	0.31	0.29	0.02	1,785.51	0.14	-	0.31
2018_Truck_Diesel	0.0042	0.54	1.20	7.42	0.03	0.03	0.01	766.35	0.06	-	0.03

8hr/24hr Peaking Factor*: 0.493093632

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

Table B1-71. 2018 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2018_Forklift_Diesel	0.01	0.16	0.13	0.00	0.00	0.00	45	0.00	-	0.00
2018_Forklift_Diesel	0.12	0.66	0.96	0.01	0.01	0.00	144	0.01	-	0.01
2018_Forklift_Diesel	0.27	1.59	2.12	0.02	0.02	0.00	337	0.03	-	0.02
2018_Forklift_Diesel	0.14	0.32	1.29	0.01	0.01	0.00	197	0.02	-	0.01
2018_Forklift_LPG	0.15	3.77	0.58	0.01	0.01	-	111	0.04	-	-
2018_Forklift_LPG	0.01	0.10	0.04	0.00	0.00	-	28	0.00	-	-
2018_Forklift_LPG	0.12	2	0.75	0.00	0.00	-	54	0.02	-	-
2018_Forklift_LPG	0.01	0.80	0.03	0.00	0.00	-	47.49	0.00	-	-
2018_Rub-trd Gantry Crane_Diesel	0.05	0.21	0.26	0.00	0.00	0.00	149.50	0.01	-	0.00
2018_Rub-trd Gantry Crane_Diesel	0.41	2.58	0.68	0.03	0.03	0.02	2,009.68	0.05	-	0.03
2018_Rub-trd Gantry Crane_Diesel	0.39	0.05	9.94	0.22	0.20	0.01	1,348.57	0.10	-	0.22
2018_Rub-trd Gantry Crane_Diesel	0.87	0.14	28.75	0.54	0.50	0.04	3,970.53	0.31	-	0.54
2018_Rub-trd Gantry Crane_Diesel	0.93	0.14	27.39	0.55	0.50	0.04	4,051.29	0.31	-	0.55
2018_Top handler_Diesel	4.40	9.01	54.93	0.26	0.23	0.05	4,655.53	0.44	-	0.26
2018_Top handler_Diesel	2.55	5.51	20.81	0.11	0.10	0.03	3,265.60	0.25	-	0.11
2018_Top handler_Diesel	2.90	6.18	12.70	0.12	0.11	0.04	3,627.24	0.28	-	0.12
2018_Top handler_Diesel	20.12	36.18	70.17	0.73	0.68	0.18	18,188.05	1.39	-	0.73
2018_Top handler_Diesel	1.27	4.16	5.37	0.05	0.04	0.03	2,961.68	0.15	-	0.05
2018_Top handler_Diesel	0.16	1.16	0.31	0.01	0.01	0.01	932.71	0.02	-	0.01
2018_Yard tractor_LPG	22.52	525.72	90.92	0.91	0.91	-	10,296.57	3.92	-	-
2018_Yard tractor_LPG	60.18	888.03	182.23	1.51	1.51	-	17,066.92	2.17	-	-
2018_Yard tractor_LPG	20.51	52.26	26.36	1.16	1.16	-	13,094.72	1.55	-	-
2018_Yard tractor_LPG	2.01	325.42	7.27	0.56	0.56	-	6,293.30	0.58	-	-
2018_Sweeper_Diesel	0.21	1.19	1.66	0.14	0.12	0.00	225.19	0.03	-	0.14
2018_Truck_Diesel	0.31	0.87	3.49	0.02	0.01	0.01	610.09	0.05	-	0.02
2018_Truck_Diesel	0.48	1.29	2.82	0.15	0.14	0.01	880.42	0.07	-	0.15
2018_Truck_Diesel	0.27	0.59	3.66	0.02	0.01	0.00	377.88	0.03	-	0.02

1hr/24hr Peaking Factor*: 0.070869965

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

Table B1-72. 2018 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2018_Forklift_Diesel	0.00	0.02	0.02	0.00	0.00	0.00	6	0.00	-	0.00
2018_Forklift_Diesel	0.02	0.10	0.14	0.00	0.00	0.00	21	0.00	-	0.00
2018_Forklift_Diesel	0.04	0.23	0.30	0.00	0.00	0.00	48	0.00	-	0.00
2018_Forklift_Diesel	0.02	0.05	0.19	0.00	0.00	0.00	28	0.00	-	0.00
2018_Forklift_LPG	0.02	0.54	0.08	0.00	0.00	-	16	0.01	-	-
2018_Forklift_LPG	0.00	0.01	0.01	0.00	0.00	-	4	0.00	-	-
2018_Forklift_LPG	0.02	0	0.11	0.00	0.00	-	8	0.00	-	-
2018_Forklift_LPG	0.00	0.12	0.00	0.00	0.00	-	6.83	0.00	-	-
2018_Rub-trd Gantry Crane_Diesel	0.01	0.03	0.04	0.00	0.00	0.00	21.49	0.00	-	0.00
2018_Rub-trd Gantry Crane_Diesel	0.06	0.37	0.10	0.00	0.00	0.00	288.84	0.01	-	0.00
2018_Rub-trd Gantry Crane_Diesel	0.06	0.01	1.43	0.03	0.03	0.00	193.82	0.01	-	0.03
2018_Rub-trd Gantry Crane_Diesel	0.12	0.02	4.13	0.08	0.07	0.01	570.66	0.04	-	0.08
2018_Rub-trd Gantry Crane_Diesel	0.13	0.02	3.94	0.08	0.07	0.01	582.27	0.04	-	0.08
2018_Top handler_Diesel	0.63	1.30	7.89	0.04	0.03	0.01	669.12	0.06	-	0.04
2018_Top handler_Diesel	0.37	0.79	2.99	0.02	0.01	0.00	469.35	0.04	-	0.02
2018_Top handler_Diesel	0.42	0.89	1.82	0.02	0.02	0.01	521.33	0.04	-	0.02
2018_Top handler_Diesel	2.89	5.20	10.09	0.11	0.10	0.03	2,614.08	0.20	-	0.11
2018_Top handler_Diesel	0.18	0.60	0.77	0.01	0.01	0.00	425.67	0.02	-	0.01
2018_Top handler_Diesel	0.02	0.17	0.04	0.00	0.00	0.00	134.05	0.00	-	0.00
2018_Yard tractor_LPG	3.24	75.56	13.07	0.13	0.13	-	1,479.88	0.56	-	-
2018_Yard tractor_LPG	8.65	127.63	26.19	0.22	0.22	-	2,452.95	0.31	-	-
2018_Yard tractor_LPG	2.95	7.51	3.79	0.17	0.17	-	1,882.04	0.22	-	-
2018_Yard tractor_LPG	0.29	46.77	1.04	0.08	0.08	-	904.51	0.08	-	-
2018_Sweeper_Diesel	0.03	0.17	0.24	0.02	0.02	0.00	32.37	0.00	-	0.02
2018_Truck_Diesel	0.04	0.12	0.50	0.00	0.00	0.00	87.69	0.01	-	0.00
2018_Truck_Diesel	0.07	0.19	0.41	0.02	0.02	0.00	126.54	0.01	-	0.02
2018_Truck_Diesel	0.04	0.08	0.53	0.00	0.00	0.00	54.31	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2023

Table B1-73. 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	Emission Controls (% reduction) PM	HC	CO
Forklift	137	2022	Diesel	0.3	1		0%	822	0%	0%	0%
Forklift	152	2020	Diesel	0.3	2		0%	3,920	0%	0%	0%
Forklift	152	2021	Diesel	0.3	2		0%	1,625	0%	0%	0%
Forklift	75	0	Electric	0.3	1		0%	369	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	1,428	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	373	0%	0%	0%
Forklift	165	0	Electric	0.3	2		0%	500	0%	0%	0%
Rub-trd Gantry Crane	197	2011	Diesel	0.2	1		0%	383	0%	0%	0%
Rub-trd Gantry Crane	197	2015	Diesel	0.2	5		0%	14,366	0%	0%	0%
Rub-trd Gantry Crane	454	2004	Diesel	0.2	2	Rypos,ULSD	100%	1,880	50%	0%	0%
Rub-trd Gantry Crane	197	2022	Diesel	0.2	8		0%	8,745	0%	0%	0%
Rub-trd Gantry Crane	685	2005	Diesel	0.2	1	Rypos,ULSD	100%	1,251	50%	0%	0%
Top handler	250	2020	Diesel	0.59	8		0%	14,343	0%	0%	0%
Top handler	260	2020	Diesel	0.59	3		0%	5,658	0%	0%	0%
Top handler	260	2022	Diesel	0.59	8		0%	13,213	0%	0%	0%
Top handler	260	2008	Diesel	0.59	15	DPF	100%	46,244	85%	0%	0%
Top handler	335	2011	Diesel	0.59	3		0%	8,668	0%	0%	0%
Top handler	370	2014	Diesel	0.59	1		0%	2,947	0%	0%	0%
Yard tractor	195	2020	CNG (ultra-low NOx)	0.39	53		0%	92,388	0%	0%	0%
Yard tractor	195	2020	CNG (ultra-low NOx)	0.39	59		0%	125,838	0%	0%	0%
Yard tractor	195	2008	LPG	0.39	43		0%	107,679	0%	0%	0%
Yard tractor	231	2011	LPG	0.39	23		0%	35,295	0%	0%	0%
Sweeper	100	2013	Diesel	0.68	1		0%	1,366	0%	0%	0%
Truck	250	2021	Diesel	0.51	2		0%	1,975	0%	0%	0%
Truck	250	2008	Diesel	0.51	2		0%	2,850	0%	0%	0%
Truck	275	2017	Diesel	0.51	1		0%	1,106	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 B1-74. 2023 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2023_Forklift_Diesel_137_2022	0.070	2.802	0.261	0.009	0.008	0.010	852.435	0.015	-
2023_Forklift_Diesel_152_2020	0.137	3.187	0.279	0.011	0.010	0.010	852.467	0.022	-
2023_Forklift_Diesel_152_2021	0.079	2.852	0.263	0.009	0.009	0.010	852.458	0.018	-
2023_Forklift_Electric_75_0	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric_165_0	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel_197_2011	0.157	1.025	1.362	0.010	0.009	0.010	852.538	0.047	-
2023_Rub-trd Gantry Crane_Diesel_197_2015	0.336	1.479	0.334	0.016	0.015	0.010	852.383	0.031	-
2023_Rub-trd Gantry Crane_Diesel_454_2004	0.604	1.270	5.126	0.177	0.163	0.008	852.065	0.066	-
2023_Rub-trd Gantry Crane_Diesel_197_2022	0.079	0.959	0.263	0.009	0.008	0.009	862.883	0.014	-
2023_Rub-trd Gantry Crane_Diesel_685_2005	0.727	1.360	5.398	0.200	0.184	0.009	849.401	0.065	-
2023_Top handler_Diesel_250_2020	0.131	1.075	0.278	0.011	0.010	0.010	852.725	0.018	-
2023_Top handler_Diesel_260_2020	0.136	1.085	0.279	0.011	0.010	0.008	850.068	0.018	-
2023_Top handler_Diesel_260_2022	0.097	1.007	0.268	0.010	0.009	0.008	850.773	0.013	-
2023_Top handler_Diesel_260_2008	1.309	2.031	3.701	0.291	0.268	0.008	854.895	0.065	-
2023_Top handler_Diesel_335_2011	0.930	1.729	2.035	0.023	0.021	0.008	853.916	0.047	-
2023_Top handler_Diesel_370_2014	0.368	1.385	0.342	0.017	0.015	0.008	854.334	0.031	-
2023_Yard tractor_CNG (ultra-low NOx)_195_2020	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2023_Yard tractor_CNG (ultra-low NOx)_195_2020	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2023_Yard tractor_LPG_195_2008	2.503	3.178	1.843	0.060	0.060	-	674.859	0.097	-
2023_Yard tractor_LPG_231_2011	0.360	60.271	1.143	0.060	0.060	-	674.859	0.092	-
2023_Sweeper_Diesel_100_2013	0.393	4.107	0.110	0.014	0.013	0.010	852.448	0.060	-
2023_Truck_Diesel_250_2021	0.084	0.982	0.265	0.009	0.009	0.010	852.519	0.016	-
2023_Truck_Diesel_250_2008	0.626	1.401	2.919	0.176	0.162	0.010	852.572	0.065	-
2023_Truck_Diesel_275_2017	0.135	1.083	0.279	0.011	0.010	0.008	850.650	0.026	-

Table B1-75. 2023 Proposed Mitigated Scenario Annual Mass Emissions

General name	(HP-Hrs)/Yr	Annual Emissions (tons/year) VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2023_Forklift_Diesel	33,768	0.00	0.10	0.01	0.00	0.00	0.00	32	0.00	-	0.00
2023_Forklift_Diesel	178,774	0.03	0.63	0.05	0.00	0.00	0.00	168	0.00	-	0.00
2023_Forklift_Diesel	74,118	0.01	0.23	0.02	0.00	0.00	0.00	70	0.00	-	0.00
2023_Forklift_Electric	8,308	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	68,543	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	17,917	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	24,739	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	15,094	0.00	0.02	0.02	0.00	0.00	0.00	14	0.00	-	0.00
2023_Rub-trd Gantry Crane_Diesel	566,022	0.21	0.92	0.21	0.01	0.01	0.01	532	0.02	-	0.01
2023_Rub-trd Gantry Crane_Diesel	170,721	0.11	0.24	0.96	0.02	0.02	0.00	160	0.01	-	0.02
2023_Rub-trd Gantry Crane_Diesel	344,562	0.03	0.36	0.10	0.00	0.00	0.00	328	0.01	-	0.00
2023_Rub-trd Gantry Crane_Diesel	171,412	0.14	0.26	1.02	0.02	0.02	0.00	160	0.01	-	0.02
2023_Top handler_Diesel	2,115,523	0.31	2.51	0.65	0.02	0.02	0.02	1,988	0.04	-	0.02
2023_Top handler_Diesel	867,978	0.13	1.04	0.27	0.01	0.01	0.01	813	0.02	-	0.01
2023_Top handler_Diesel	2,026,837	0.22	2.25	0.60	0.02	0.02	0.02	1,901	0.03	-	0.02
2023_Top handler_Diesel	7,093,887	10.24	15.88	28.94	0.34	0.31	0.07	6,685	0.51	-	0.34
2023_Top handler_Diesel	1,713,275	1.76	3.27	3.84	0.04	0.04	0.02	1,613	0.09	-	0.04
2023_Top handler_Diesel	643,252	0.26	0.98	0.24	0.01	0.01	0.01	606	0.02	-	0.01
2023_Yard tractor_CNG (ultra-low NOx)	7,026,094	0.07	11.62	0.08	0.02	0.02	-	3,601	4.34	-	-
2023_Yard tractor_CNG (ultra-low NOx)	9,569,984	0.10	15.82	0.11	0.02	0.02	-	4,905	5.91	-	-
2023_Yard tractor_LPG	8,189,010	22.59	28.68	16.63	0.54	0.54	-	6,092	0.88	-	-
2023_Yard tractor_LPG	3,179,717	1.26	211.25	4.01	0.21	0.21	-	2,365	0.32	-	-
2023_Sweeper_Diesel	92,913	0.04	0.42	0.01	0.00	0.00	0.00	87	0.01	-	0.00
2023_Truck_Diesel	251,769	0.02	0.27	0.07	0.00	0.00	0.00	237	0.00	-	0.00
2023_Truck_Diesel	363,405	0.25	0.56	1.17	0.07	0.06	0.00	342	0.03	-	0.07
2023_Truck_Diesel	155,116	0.02	0.19	0.05	0.00	0.00	0.00	145	0.00	-	0.00

Table B1-76. 2023 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2023_Forklift_Diesel	0.0040	0.02	0.84	0.08	0.00	0.00	0.00	257	0.00	-	0.00
2023_Forklift_Diesel	0.0040	0.22	5.09	0.45	0.02	0.02	0.02	1,360	0.03	-	0.02
2023_Forklift_Diesel	0.0040	0.05	1.89	0.17	0.01	0.01	0.01	564	0.01	-	0.01
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.02	0.14	0.18	0.00	0.00	0.00	114.87	0.01	-	0.00
2023_Rub-trd Gantry Crane_Diesel	0.0040	1.70	7.47	1.69	0.08	0.07	0.05	4,307.05	0.16	-	0.08
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.92	1.94	7.81	0.13	0.12	0.01	1,298.59	0.10	-	0.13
2023_Rub-trd Gantry Crane_Diesel	0.0040	0.24	2.95	0.81	0.03	0.03	0.03	2,654.19	0.04	-	0.03
2023_Rub-trd Gantry Crane_Diesel	0.0040	1.11	2.08	8.26	0.15	0.14	0.01	1,299.77	0.10	-	0.15
2023_Top handler_Diesel	0.0040	2.48	20.31	5.24	0.20	0.18	0.18	16,104.18	0.34	-	0.20
2023_Top handler_Diesel	0.0040	1.06	8.41	2.16	0.08	0.08	0.06	6,586.80	0.14	-	0.08
2023_Top handler_Diesel	0.0040	1.75	18.23	4.85	0.17	0.16	0.15	15,393.75	0.24	-	0.17
2023_Top handler_Diesel	0.0040	82.90	128.63	234.38	2.76	2.54	0.53	54,138.86	4.14	-	2.76
2023_Top handler_Diesel	0.0040	14.23	26.45	31.13	0.34	0.32	0.13	13,060.34	0.72	-	0.34
2023_Top handler_Diesel	0.0040	2.11	7.96	1.97	0.10	0.09	0.05	4,905.93	0.18	-	0.10
2023_Yard tractor_CNG (ultra-low NOx)	0.0040	0.58	94.08	0.63	0.13	0.13	-	29,166.13	35.12	-	-
2023_Yard tractor_CNG (ultra-low NOx)	0.0040	0.79	128.15	0.85	0.17	0.17	-	39,726.12	47.84	-	-
2023_Yard tractor_LPG	0.0040	182.97	232.29	134.71	4.36	4.36	-	49,335.18	7.12	-	-
2023_Yard tractor_LPG	0.0040	10.21	1,710.82	32.44	1.69	1.69	-	19,156.39	2.61	-	-
2023_Sweeper_Diesel	0.0040	0.33	3.41	0.09	0.01	0.01	0.01	707.06	0.05	-	0.01
2023_Truck_Diesel	0.0040	0.19	2.21	0.59	0.02	0.02	0.02	1,916.10	0.04	-	0.02
2023_Truck_Diesel	0.0040	2.03	4.54	9.47	0.57	0.52	0.03	2,765.89	0.21	-	0.57
2023_Truck_Diesel	0.0040	0.19	1.50	0.39	0.01	0.01	0.01	1,177.93	0.04	-	0.01

8hr/24hr Peaking Factor*: 0.529716683

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

Table B1-77. 2023 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Forklift_Diesel	0.01	0.45	0.04	0.00	0.00	0.00	136	0.00	-	0.00
2023_Forklift_Diesel	0.12	2.69	0.24	0.01	0.01	0.01	721	0.02	-	0.01
2023_Forklift_Diesel	0.03	1.00	0.09	0.00	0.00	0.00	299	0.01	-	0.00
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	0.01	0.07	0.10	0.00	0.00	0.00	60.85	0.00	-	0.00
2023_Rub-trd Gantry Crane_Diesel	0.90	3.96	0.89	0.04	0.04	0.03	2,281.51	0.08	-	0.04
2023_Rub-trd Gantry Crane_Diesel	0.49	1.03	4.14	0.07	0.07	0.01	687.88	0.05	-	0.07
2023_Rub-trd Gantry Crane_Diesel	0.13	1.56	0.43	0.01	0.01	0.01	1,405.97	0.02	-	0.01
2023_Rub-trd Gantry Crane_Diesel	0.59	1.10	4.38	0.08	0.07	0.01	688.51	0.05	-	0.08
2023_Top handler_Diesel	1.31	10.76	2.78	0.11	0.10	0.10	8,530.65	0.18	-	0.11
2023_Top handler_Diesel	0.56	4.45	1.14	0.04	0.04	0.03	3,489.14	0.07	-	0.04
2023_Top handler_Diesel	0.93	9.66	2.57	0.09	0.09	0.08	8,154.33	0.13	-	0.09
2023_Top handler_Diesel	43.91	68.14	124.16	1.46	1.35	0.28	28,678.26	2.19	-	1.46
2023_Top handler_Diesel	7.54	14.01	16.49	0.18	0.17	0.07	6,918.28	0.38	-	0.18
2023_Top handler_Diesel	1.12	4.21	1.04	0.05	0.05	0.03	2,598.75	0.09	-	0.05
2023_Yard tractor_CNG (ultra-low NOx)	0.31	49.84	0.33	0.07	0.07	-	15,449.79	18.61	-	-
2023_Yard tractor_CNG (ultra-low NOx)	0.42	67.88	0.45	0.09	0.09	-	21,043.59	25.34	-	-
2023_Yard tractor_LPG	96.92	123.05	71.36	2.31	2.31	-	26,133.67	3.77	-	-
2023_Yard tractor_LPG	5.41	906.25	17.18	0.90	0.90	-	10,147.46	1.38	-	-
2023_Sweeper_Diesel	0.17	1.80	0.05	0.01	0.01	0.00	374.54	0.03	-	0.01
2023_Truck_Diesel	0.10	1.17	0.32	0.01	0.01	0.01	1,014.99	0.02	-	0.01
2023_Truck_Diesel	1.08	2.41	5.02	0.30	0.28	0.02	1,465.14	0.11	-	0.30
2023_Truck_Diesel	0.10	0.79	0.20	0.01	0.01	0.01	623.97	0.02	-	0.01

1hr/24hr Peaking Factor*: 0.073685169

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

Table B1-78. 2023 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2023_Forklift_Diesel	0.00	0.06	0.01	0.00	0.00	0.00	19	0.00	-	0.00
2023_Forklift_Diesel	0.02	0.37	0.03	0.00	0.00	0.00	100	0.00	-	0.00
2023_Forklift_Diesel	0.00	0.14	0.01	0.00	0.00	0.00	42	0.00	-	0.00
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2023_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.01	0.00	0.00	0.00	8.46	0.00	-	0.00
2023_Rub-trd Gantry Crane_Diesel	0.13	0.55	0.12	0.01	0.01	0.00	317.37	0.01	-	0.01
2023_Rub-trd Gantry Crane_Diesel	0.07	0.14	0.58	0.01	0.01	0.00	95.69	0.01	-	0.01
2023_Rub-trd Gantry Crane_Diesel	0.02	0.22	0.06	0.00	0.00	0.00	195.57	0.00	-	0.00
2023_Rub-trd Gantry Crane_Diesel	0.08	0.15	0.61	0.01	0.01	0.00	95.77	0.01	-	0.01
2023_Top handler_Diesel	0.18	1.50	0.39	0.01	0.01	0.01	1,186.64	0.03	-	0.01
2023_Top handler_Diesel	0.08	0.62	0.16	0.01	0.01	0.00	485.35	0.01	-	0.01
2023_Top handler_Diesel	0.13	1.34	0.36	0.01	0.01	0.01	1,134.29	0.02	-	0.01
2023_Top handler_Diesel	6.11	9.48	17.27	0.20	0.19	0.04	3,989.23	0.30	-	0.20
2023_Top handler_Diesel	1.05	1.95	2.29	0.03	0.02	0.01	962.35	0.05	-	0.03
2023_Top handler_Diesel	0.16	0.59	0.14	0.01	0.01	0.00	361.49	0.01	-	0.01
2023_Yard tractor_CNG (ultra-low NOx)	0.04	6.93	0.05	0.01	0.01	-	2,149.11	2.59	-	-
2023_Yard tractor_CNG (ultra-low NOx)	0.06	9.44	0.06	0.01	0.01	-	2,927.23	3.53	-	-
2023_Yard tractor_LPG	13.48	17.12	9.93	0.32	0.32	-	3,635.27	0.52	-	-
2023_Yard tractor_LPG	0.75	126.06	2.39	0.12	0.12	-	1,411.54	0.19	-	-
2023_Sweeper_Diesel	0.02	0.25	0.01	0.00	0.00	0.00	52.10	0.00	-	0.00
2023_Truck_Diesel	0.01	0.16	0.04	0.00	0.00	0.00	141.19	0.00	-	0.00
2023_Truck_Diesel	0.15	0.33	0.70	0.04	0.04	0.00	203.80	0.02	-	0.04
2023_Truck_Diesel	0.01	0.11	0.03	0.00	0.00	0.00	86.80	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2030

Table B1-79. 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	Emission Controls (% reduction) PM	HC	CO
Forklift	137	2022	Diesel	0.3	1		0%	917	0%	0%	0%
Forklift	152	2020	Diesel	0.3	2		0%	4,377	0%	0%	0%
Forklift	152	2021	Diesel	0.3	2		0%	1,815	0%	0%	0%
Forklift	75	0	Electric	0.3	1		0%	412	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	1,594	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	417	0%	0%	0%
Forklift	165	0	Electric	0.3	2		0%	558	0%	0%	0%
Rub-trd Gantry Crane	197	2011	Diesel	0.2	1		0%	428	0%	0%	0%
Rub-trd Gantry Crane	197	2015	Diesel	0.2	5		0%	16,040	0%	0%	0%
Rub-trd Gantry Crane	197	2024	Diesel	0.2	2		0%	2,099	0%	0%	0%
Rub-trd Gantry Crane	197	2022	Diesel	0.2	8		0%	9,764	0%	0%	0%
Rub-trd Gantry Crane	197	2026	Diesel	0.2	1		0%	279	0%	0%	0%
Top handler	250	2020	Diesel	0.59	8		0%	16,014	0%	0%	0%
Top handler	260	2020	Diesel	0.59	3		0%	6,318	0%	0%	0%
Top handler	260	2022	Diesel	0.59	8		0%	14,753	0%	0%	0%
Top handler	260	2024	Diesel	0.59	15		0%	51,633	0%	0%	0%
Top handler	335	2024	Diesel	0.59	3		0%	9,678	0%	0%	0%
Top handler	370	2024	Diesel	0.59	1		0%	3,290	0%	0%	0%
Yard tractor	195	2020	CNG (ultra-low NOx)	0.39	53		0%	103,154	0%	0%	0%
Yard tractor	195	2020	CNG (ultra-low NOx)	0.39	59		0%	140,503	0%	0%	0%
Yard tractor	195	2024	CNG (ultra-low NOx)	0.39	43		0%	120,228	0%	0%	0%
Yard tractor	231	2024	CNG (ultra-low NOx)	0.39	23		0%	39,408	0%	0%	0%
Sweeper	100	2025	Diesel	0.68	1		0%	1,526	0%	0%	0%
Truck	250	2021	Diesel	0.51	2		0%	2,205	0%	0%	0%
Truck	250	2024	Diesel	0.51	2		0%	3,182	0%	0%	0%
Truck	275	2017	Diesel	0.51	1		0%	1,235	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 B1-80. 2030 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2030_Forklift_Diesel_137_2022	0.132	3.158	0.278	0.011	0.010	0.010	852.437	0.031	-
2030_Forklift_Diesel_152_2020	0.284	4.038	0.319	0.016	0.015	0.010	852.467	0.031	-
2030_Forklift_Diesel_152_2021	0.140	3.207	0.280	0.011	0.010	0.010	852.441	0.031	-
2030_Forklift_Electric_75_0	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric_165_0	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel_197_2011	0.202	1.082	1.401	0.011	0.010	0.010	852.521	0.047	-
2030_Rub-trd Gantry Crane_Diesel_197_2015	0.556	1.914	0.394	0.021	0.020	0.010	852.371	0.031	-
2030_Rub-trd Gantry Crane_Diesel_197_2024	0.136	1.042	0.279	0.011	0.010	0.008	852.494	0.027	-
2030_Rub-trd Gantry Crane_Diesel_197_2022	0.170	1.094	0.288	0.012	0.011	0.008	840.945	0.031	-
2030_Rub-trd Gantry Crane_Diesel_197_2026	0.131	1.036	0.277	0.011	0.010	0.008	840.681	0.021	-
2030_Top handler_Diesel_250_2020	0.269	1.347	0.315	0.014	0.013	0.010	852.512	0.031	-
2030_Top handler_Diesel_260_2020	0.283	1.374	0.319	0.014	0.013	0.008	851.981	0.031	-
2030_Top handler_Diesel_260_2022	0.252	1.314	0.311	0.014	0.013	0.008	851.918	0.031	-
2030_Top handler_Diesel_260_2024	0.299	1.406	0.323	0.015	0.014	0.008	849.733	0.026	-
2030_Top handler_Diesel_335_2024	0.348	1.356	0.337	0.016	0.015	0.008	849.733	0.026	-
2030_Top handler_Diesel_370_2024	0.273	1.246	0.316	0.014	0.013	0.008	849.733	0.026	-
2030_Yard tractor_CNG (ultra-low NOx)_195_2020	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2030_Yard tractor_CNG (ultra-low NOx)_195_2020	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2030_Yard tractor_CNG (ultra-low NOx)_195_2024	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2030_Yard tractor_CNG (ultra-low NOx)_231_2024	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2030_Sweeper_Diesel_100_2025	0.140	3.626	0.103	0.011	0.010	0.010	852.449	0.032	-
2030_Truck_Diesel_250_2021	0.158	1.128	0.285	0.011	0.010	0.010	852.710	0.031	-
2030_Truck_Diesel_250_2024	0.159	1.130	0.285	0.011	0.010	0.010	852.038	0.026	-
2030_Truck_Diesel_275_2017	0.218	1.247	0.301	0.013	0.012	0.008	854.206	0.031	-

Table B1-81. 2030 Proposed Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2030_Forklift_Diesel	37,704	0.01	0.13	0.01	0.00	0.00	0.00	35	0.00	-	0.00
2030_Forklift_Diesel	199,607	0.06	0.89	0.07	0.00	0.00	0.00	188	0.01	-	0.00
2030_Forklift_Diesel	82,755	0.01	0.29	0.03	0.00	0.00	0.00	78	0.00	-	0.00
2030_Forklift_Electric	9,277	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	76,530	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	20,005	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	27,622	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	16,853	0.00	0.02	0.03	0.00	0.00	0.00	16	0.00	-	0.00
2030_Rub-trd Gantry Crane_Diesel	631,983	0.39	1.33	0.27	0.01	0.01	0.01	594	0.02	-	0.01
2030_Rub-trd Gantry Crane_Diesel	82,712	0.01	0.10	0.03	0.00	0.00	0.00	78	0.00	-	0.00
2030_Rub-trd Gantry Crane_Diesel	384,716	0.07	0.46	0.12	0.00	0.00	0.00	357	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	11,008	0.00	0.01	0.00	0.00	0.00	0.00	10	0.00	-	0.00
2030_Top handler_Diesel	2,362,055	0.70	3.51	0.82	0.04	0.03	0.02	2,220	0.08	-	0.04
2030_Top handler_Diesel	969,128	0.30	1.47	0.34	0.02	0.01	0.01	910	0.03	-	0.02
2030_Top handler_Diesel	2,263,034	0.63	3.28	0.77	0.03	0.03	0.02	2,125	0.08	-	0.03
2030_Top handler_Diesel	7,920,571	2.61	12.28	2.82	0.13	0.12	0.07	7,419	0.22	-	0.13
2030_Top handler_Diesel	1,912,931	0.73	2.86	0.71	0.03	0.03	0.02	1,792	0.05	-	0.03
2030_Top handler_Diesel	718,214	0.22	0.99	0.25	0.01	0.01	0.01	673	0.02	-	0.01
2030_Yard tractor_CNG (ultra-low NOx)	7,844,878	0.08	12.97	0.09	0.02	0.02	-	4,021	4.84	-	-
2030_Yard tractor_CNG (ultra-low NOx)	10,685,221	0.11	17.67	0.12	0.02	0.02	-	5,477	6.60	-	-
2030_Yard tractor_CNG (ultra-low NOx)	9,143,315	0.09	15.12	0.10	0.02	0.02	-	4,687	5.64	-	-
2030_Yard tractor_CNG (ultra-low NOx)	3,550,265	0.04	5.87	0.04	0.01	0.01	-	1,820	2.19	-	-
2030_Sweeper_Diesel	103,740	0.02	0.41	0.01	0.00	0.00	0.00	97	0.00	-	0.00
2030_Truck_Diesel	281,109	0.05	0.35	0.09	0.00	0.00	0.00	264	0.01	-	0.00
2030_Truck_Diesel	405,755	0.07	0.51	0.13	0.01	0.00	0.00	381	0.01	-	0.01
2030_Truck_Diesel	173,192	0.04	0.24	0.06	0.00	0.00	0.00	163	0.01	-	0.00

Table B1-82. 2030 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2030_Forklift_Diesel	0.0040	0.04	1.06	0.09	0.00	0.00	0.00	287	0.01	-	0.00
2030_Forklift_Diesel	0.0040	0.51	7.20	0.57	0.03	0.03	0.02	1,519	0.06	-	0.03
2030_Forklift_Diesel	0.0040	0.10	2.37	0.21	0.01	0.01	0.01	630	0.02	-	0.01
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.03	0.16	0.21	0.00	0.00	0.00	128.26	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	0.0040	3.14	10.80	2.22	0.12	0.11	0.05	4,808.90	0.17	-	0.12
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.10	0.77	0.21	0.01	0.01	0.01	629.47	0.02	-	0.01
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.59	3.76	0.99	0.04	0.04	0.03	2,888.15	0.11	-	0.04
2030_Rub-trd Gantry Crane_Diesel	0.0040	0.01	0.10	0.03	0.00	0.00	0.00	82.62	0.00	-	0.00
2030_Top handler_Diesel	0.0040	5.67	28.40	6.65	0.30	0.27	0.20	17,976.39	0.65	-	0.30
2030_Top handler_Diesel	0.0040	2.45	11.89	2.76	0.12	0.11	0.07	7,370.94	0.27	-	0.12
2030_Top handler_Diesel	0.0040	5.09	26.54	6.28	0.28	0.25	0.17	17,210.78	0.62	-	0.28
2030_Top handler_Diesel	0.0040	21.15	99.42	22.87	1.05	0.96	0.59	60,082.91	1.81	-	1.05
2030_Top handler_Diesel	0.0040	5.94	23.15	5.75	0.27	0.25	0.14	14,510.88	0.44	-	0.27
2030_Top handler_Diesel	0.0040	1.75	7.99	2.03	0.09	0.08	0.05	5,448.14	0.16	-	0.09
2030_Yard tractor_CNG (ultra-low NOx)	0.0040	0.65	105.05	0.70	0.14	0.14	-	32,565.00	39.22	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.0040	0.89	143.08	0.95	0.19	0.19	-	44,355.59	53.42	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.0040	0.76	122.44	0.82	0.16	0.16	-	37,954.96	45.71	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.0040	0.29	47.54	0.32	0.06	0.06	-	14,737.56	17.75	-	-
2030_Sweeper_Diesel	0.0040	0.13	3.36	0.10	0.01	0.01	0.01	789.46	0.03	-	0.01
2030_Truck_Diesel	0.0040	0.40	2.83	0.71	0.03	0.03	0.02	2,139.87	0.08	-	0.03
2030_Truck_Diesel	0.0040	0.58	4.09	1.03	0.04	0.04	0.03	3,086.27	0.09	-	0.04
2030_Truck_Diesel	0.0040	0.34	1.93	0.47	0.02	0.02	0.01	1,320.70	0.05	-	0.02

8hr/24hr Peaking Factor*: 0.529716683

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

Table B1-83. 2030 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Forklift_Diesel	0.02	0.56	0.05	0.00	0.00	0.00	152	0.01	-	0.00
2030_Forklift_Diesel	0.27	3.81	0.30	0.02	0.01	0.01	805	0.03	-	0.02
2030_Forklift_Diesel	0.05	1.26	0.11	0.00	0.00	0.00	334	0.01	-	0.00
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	0.02	0.09	0.11	0.00	0.00	0.00	67.94	0.00	-	0.00
2030_Rub-trd Gantry Crane_Diesel	1.66	5.72	1.18	0.06	0.06	0.03	2,547.35	0.09	-	0.06
2030_Rub-trd Gantry Crane_Diesel	0.05	0.41	0.11	0.00	0.00	0.00	333.44	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	0.31	1.99	0.52	0.02	0.02	0.02	1,529.90	0.06	-	0.02
2030_Rub-trd Gantry Crane_Diesel	0.01	0.05	0.01	0.00	0.00	0.00	43.76	0.00	-	0.00
2030_Top handler_Diesel	3.00	15.04	3.52	0.16	0.14	0.11	9,522.39	0.35	-	0.16
2030_Top handler_Diesel	1.30	6.30	1.46	0.07	0.06	0.04	3,904.51	0.14	-	0.07
2030_Top handler_Diesel	2.70	14.06	3.32	0.15	0.13	0.09	9,116.84	0.33	-	0.15
2030_Top handler_Diesel	11.20	52.67	12.12	0.56	0.51	0.31	31,826.92	0.96	-	0.56
2030_Top handler_Diesel	3.14	12.26	3.05	0.15	0.13	0.08	7,686.66	0.23	-	0.15
2030_Top handler_Diesel	0.93	4.23	1.07	0.05	0.04	0.03	2,885.97	0.09	-	0.05
2030_Yard tractor_CNG (ultra-low NOx)	0.35	55.65	0.37	0.07	0.07	-	17,250.22	20.77	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.47	75.79	0.51	0.10	0.10	-	23,495.90	28.30	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.40	64.86	0.43	0.09	0.09	-	20,105.38	24.21	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.16	25.18	0.17	0.03	0.03	-	7,806.73	9.40	-	-
2030_Sweeper_Diesel	0.07	1.78	0.05	0.01	0.01	0.00	418.19	0.02	-	0.01
2030_Truck_Diesel	0.21	1.50	0.38	0.01	0.01	0.01	1,133.53	0.04	-	0.01
2030_Truck_Diesel	0.31	2.17	0.55	0.02	0.02	0.02	1,634.85	0.05	-	0.02
2030_Truck_Diesel	0.18	1.02	0.25	0.01	0.01	0.01	699.59	0.03	-	0.01

1hr/24hr Peaking Factor*: 0.073685169

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

Table B1-84. 2030 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2030_Forklift_Diesel	0.00	0.08	0.01	0.00	0.00	0.00	21	0.00	-	0.00
2030_Forklift_Diesel	0.04	0.53	0.04	0.00	0.00	0.00	112	0.00	-	0.00
2030_Forklift_Diesel	0.01	0.17	0.02	0.00	0.00	0.00	46	0.00	-	0.00
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2030_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.02	0.00	0.00	0.00	9.45	0.00	-	0.00
2030_Rub-trd Gantry Crane_Diesel	0.23	0.80	0.16	0.01	0.01	0.00	354.34	0.01	-	0.01
2030_Rub-trd Gantry Crane_Diesel	0.01	0.06	0.02	0.00	0.00	0.00	46.38	0.00	-	0.00
2030_Rub-trd Gantry Crane_Diesel	0.04	0.28	0.07	0.00	0.00	0.00	212.81	0.01	-	0.00
2030_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	6.09	0.00	-	0.00
2030_Top handler_Diesel	0.42	2.09	0.49	0.02	0.02	0.01	1,324.59	0.05	-	0.02
2030_Top handler_Diesel	0.18	0.88	0.20	0.01	0.01	0.01	543.13	0.02	-	0.01
2030_Top handler_Diesel	0.38	1.96	0.46	0.02	0.02	0.01	1,268.18	0.05	-	0.02
2030_Top handler_Diesel	1.56	7.33	1.69	0.08	0.07	0.04	4,427.22	0.13	-	0.08
2030_Top handler_Diesel	0.44	1.71	0.42	0.02	0.02	0.01	1,069.24	0.03	-	0.02
2030_Top handler_Diesel	0.13	0.59	0.15	0.01	0.01	0.00	401.45	0.01	-	0.01
2030_Yard tractor_CNG (ultra-low NOx)	0.05	7.74	0.05	0.01	0.01	-	2,399.56	2.89	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.07	10.54	0.07	0.01	0.01	-	3,268.35	3.94	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.06	9.02	0.06	0.01	0.01	-	2,796.72	3.37	-	-
2030_Yard tractor_CNG (ultra-low NOx)	0.02	3.50	0.02	0.00	0.00	-	1,085.94	1.31	-	-
2030_Sweeper_Diesel	0.01	0.25	0.01	0.00	0.00	0.00	58.17	0.00	-	0.00
2030_Truck_Diesel	0.03	0.21	0.05	0.00	0.00	0.00	157.68	0.01	-	0.00
2030_Truck_Diesel	0.04	0.30	0.08	0.00	0.00	0.00	227.41	0.01	-	0.00
2030_Truck_Diesel	0.02	0.14	0.03	0.00	0.00	0.00	97.32	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2036

Table B1-85. 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	Emission Controls (% reduction) PM	HC	CO
Forklift	137	2022	Diesel	0.3	1		0%	917	0%	0%	0%
Forklift	152	2036	Diesel	0.3	2		0%	4,377	0%	0%	0%
Forklift	152	2021	Diesel	0.3	2		0%	1,815	0%	0%	0%
Forklift	75	0	Electric	0.3	1		0%	412	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	1,594	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	417	0%	0%	0%
Forklift	165	0	Electric	0.3	2		0%	558	0%	0%	0%
Rub-trd Gantry Crane	197	2035	Diesel	0.2	1		0%	428	0%	0%	0%
Rub-trd Gantry Crane	197	2015	Diesel	0.2	5		0%	16,040	0%	0%	0%
Rub-trd Gantry Crane	197	2024	Diesel	0.2	2		0%	2,099	0%	0%	0%
Rub-trd Gantry Crane	197	2022	Diesel	0.2	8		0%	9,764	0%	0%	0%
Rub-trd Gantry Crane	197	2026	Diesel	0.2	1		0%	279	0%	0%	0%
Top handler	250	2036	Diesel	0.59	8		0%	16,014	0%	0%	0%
Top handler	260	2036	Diesel	0.59	3		0%	6,318	0%	0%	0%
Top handler	260	2022	Diesel	0.59	8		0%	14,753	0%	0%	0%
Top handler	260	2024	Diesel	0.59	15		0%	51,633	0%	0%	0%
Top handler	335	2024	Diesel	0.59	3		0%	9,678	0%	0%	0%
Top handler	370	2024	Diesel	0.59	1		0%	3,290	0%	0%	0%
Yard tractor	195	2032	CNG (ultra-low NOx)	0.39	53		0%	103,154	0%	0%	0%
Yard tractor	195	2032	CNG (ultra-low NOx)	0.39	59		0%	140,503	0%	0%	0%
Yard tractor	195	2036	CNG (ultra-low NOx)	0.39	43		0%	120,228	0%	0%	0%
Yard tractor	231	2036	CNG (ultra-low NOx)	0.39	23		0%	39,408	0%	0%	0%
Sweeper	100	2025	Diesel	0.68	1		0%	1,526	0%	0%	0%
Truck	250	2021	Diesel	0.51	2		0%	2,205	0%	0%	0%
Truck	250	2024	Diesel	0.51	2		0%	3,182	0%	0%	0%
Truck	275	2033	Diesel	0.51	1		0%	1,235	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 B1-86. 2036 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2036_Forklift_Diesel_137_2022	0.184	3.464	0.292	0.013	0.012	0.010	852.541	0.031	-
2036_Forklift_Diesel_152_2036	0.074	2.822	0.262	0.009	0.008	0.010	852.453	0.012	-
2036_Forklift_Diesel_152_2021	0.193	3.512	0.294	0.013	0.012	0.010	852.463	0.031	-
2036_Forklift_Electric_75_0	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric_165_0	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel_197_2035	0.061	0.936	0.258	0.009	0.008	0.010	852.471	0.014	-
2036_Rub-trd Gantry Crane_Diesel_197_2015	0.745	2.286	0.446	0.026	0.024	0.010	852.811	0.031	-
2036_Rub-trd Gantry Crane_Diesel_197_2024	0.207	1.147	0.298	0.012	0.011	0.008	852.185	0.031	-
2036_Rub-trd Gantry Crane_Diesel_197_2022	0.249	1.210	0.310	0.014	0.012	0.008	832.495	0.030	-
2036_Rub-trd Gantry Crane_Diesel_197_2026	0.225	1.175	0.303	0.013	0.012	0.009	872.369	0.032	-
2036_Top handler_Diesel_250_2036	0.072	0.959	0.261	0.009	0.008	0.010	852.213	0.011	-
2036_Top handler_Diesel_260_2036	0.074	0.961	0.262	0.009	0.008	0.008	850.443	0.011	-
2036_Top handler_Diesel_260_2022	0.385	1.576	0.347	0.017	0.016	0.008	853.018	0.031	-
2036_Top handler_Diesel_260_2024	0.510	1.823	0.381	0.020	0.019	0.008	852.431	0.031	-
2036_Top handler_Diesel_335_2024	0.600	1.729	0.406	0.023	0.021	0.008	852.431	0.031	-
2036_Top handler_Diesel_370_2024	0.462	1.525	0.368	0.019	0.017	0.008	852.431	0.031	-
2036_Yard tractor_CNG (ultra-low NOx)_195_2032	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2036_Yard tractor_CNG (ultra-low NOx)_195_2032	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2036_Yard tractor_CNG (ultra-low NOx)_195_2036	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2036_Yard tractor_CNG (ultra-low NOx)_231_2036	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2036_Sweeper_Diesel_100_2025	0.228	4.203	0.112	0.014	0.013	0.010	852.456	0.045	-
2036_Truck_Diesel_250_2021	0.222	1.253	0.302	0.013	0.012	0.010	852.373	0.031	-
2036_Truck_Diesel_250_2024	0.251	1.311	0.310	0.014	0.013	0.010	852.673	0.031	-
2036_Truck_Diesel_275_2033	0.100	1.013	0.269	0.010	0.009	0.008	851.977	0.018	-

Table B1-87. 2036 Proposed Mitigated Scenario Annual Mass Emissions

		Annual Emissions (tons/year)									
General name	(HP-Hrs)/Yr	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2036_Forklift_Diesel	37,704	0.01	0.14	0.01	0.00	0.00	0.00	35	0.00	-	0.00
2036_Forklift_Diesel	199,607	0.02	0.62	0.06	0.00	0.00	0.00	188	0.00	-	0.00
2036_Forklift_Diesel	82,755	0.02	0.32	0.03	0.00	0.00	0.00	78	0.00	-	0.00
2036_Forklift_Electric	9,277	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	76,530	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	20,005	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	27,622	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	16,853	0.00	0.02	0.00	0.00	0.00	0.00	16	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	631,983	0.52	1.59	0.31	0.02	0.02	0.01	594	0.02	-	0.02
2036_Rub-trd Gantry Crane_Diesel	82,712	0.02	0.10	0.03	0.00	0.00	0.00	78	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	384,716	0.11	0.51	0.13	0.01	0.01	0.00	353	0.01	-	0.01
2036_Rub-trd Gantry Crane_Diesel	11,008	0.00	0.01	0.00	0.00	0.00	0.00	11	0.00	-	0.00
2036_Top handler_Diesel	2,362,055	0.19	2.50	0.68	0.02	0.02	0.02	2,219	0.03	-	0.02
2036_Top handler_Diesel	969,128	0.08	1.03	0.28	0.01	0.01	0.01	908	0.01	-	0.01
2036_Top handler_Diesel	2,263,034	0.96	3.93	0.87	0.04	0.04	0.02	2,128	0.08	-	0.04
2036_Top handler_Diesel	7,920,571	4.46	15.91	3.33	0.18	0.16	0.07	7,442	0.27	-	0.18
2036_Top handler_Diesel	1,912,931	1.27	3.65	0.86	0.05	0.04	0.02	1,797	0.07	-	0.05
2036_Top handler_Diesel	718,214	0.37	1.21	0.29	0.02	0.01	0.01	675	0.02	-	0.02
2036_Yard tractor_CNG (ultra-low NOx)	7,844,878	0.08	12.97	0.09	0.02	0.02	-	4,021	4.84	-	-
2036_Yard tractor_CNG (ultra-low NOx)	10,685,221	0.11	17.67	0.12	0.02	0.02	-	5,477	6.60	-	-
2036_Yard tractor_CNG (ultra-low NOx)	9,143,315	0.09	15.12	0.10	0.02	0.02	-	4,687	5.64	-	-
2036_Yard tractor_CNG (ultra-low NOx)	3,550,265	0.04	5.87	0.04	0.01	0.01	-	1,820	2.19	-	-
2036_Sweeper_Diesel	103,740	0.03	0.48	0.01	0.00	0.00	0.00	97	0.01	-	0.00
2036_Truck_Diesel	281,109	0.07	0.39	0.09	0.00	0.00	0.00	264	0.01	-	0.00
2036_Truck_Diesel	405,755	0.11	0.59	0.14	0.01	0.01	0.00	381	0.01	-	0.01
2036_Truck_Diesel	173,192	0.02	0.19	0.05	0.00	0.00	0.00	163	0.00	-	0.00

Table B1-88. 2036 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2036_Forklift_Diesel	0.0040	0.06	1.17	0.10	0.00	0.00	0.00	287	0.01	-	0.00
2036_Forklift_Diesel	0.0040	0.13	5.03	0.47	0.02	0.02	0.02	1,519	0.02	-	0.02
2036_Forklift_Diesel	0.0040	0.14	2.59	0.22	0.01	0.01	0.01	630	0.02	-	0.01
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.01	0.14	0.04	0.00	0.00	0.00	128.25	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	0.0040	4.21	12.90	2.51	0.15	0.14	0.05	4,811.38	0.17	-	0.15
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.15	0.85	0.22	0.01	0.01	0.01	629.24	0.02	-	0.01
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.85	4.16	1.06	0.05	0.04	0.03	2,859.13	0.10	-	0.05
2036_Rub-trd Gantry Crane_Diesel	0.0040	0.02	0.12	0.03	0.00	0.00	0.00	85.73	0.00	-	0.00
2036_Top handler_Diesel	0.0040	1.52	20.22	5.51	0.19	0.18	0.20	17,970.09	0.22	-	0.19
2036_Top handler_Diesel	0.0040	0.64	8.32	2.26	0.08	0.07	0.07	7,357.63	0.09	-	0.08
2036_Top handler_Diesel	0.0040	7.78	31.84	7.01	0.34	0.32	0.17	17,233.01	0.63	-	0.34
2036_Top handler_Diesel	0.0040	36.09	128.89	26.96	1.43	1.32	0.59	60,273.69	2.19	-	1.43
2036_Top handler_Diesel	0.0040	10.25	29.53	6.93	0.38	0.35	0.14	14,556.96	0.53	-	0.38
2036_Top handler_Diesel	0.0040	2.96	9.78	2.36	0.12	0.11	0.05	5,465.44	0.20	-	0.12
2036_Yard tractor_CNG (ultra-low NOx)	0.0040	0.65	105.05	0.70	0.14	0.14	-	32,565.00	39.22	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.0040	0.89	143.08	0.95	0.19	0.19	-	44,355.59	53.42	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.0040	0.76	122.44	0.82	0.16	0.16	-	37,954.96	45.71	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.0040	0.29	47.54	0.32	0.06	0.06	-	14,737.56	17.75	-	-
2036_Sweeper_Diesel	0.0040	0.21	3.89	0.10	0.01	0.01	0.01	789.46	0.04	-	0.01
2036_Truck_Diesel	0.0040	0.56	3.14	0.76	0.03	0.03	0.02	2,139.03	0.08	-	0.03
2036_Truck_Diesel	0.0040	0.91	4.75	1.12	0.05	0.05	0.03	3,088.57	0.11	-	0.05
2036_Truck_Diesel	0.0040	0.15	1.57	0.42	0.02	0.01	0.01	1,317.25	0.03	-	0.02

8hr/24hr Peaking Factor*: 0.529716683

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

Table B1-89. 2036 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Forklift_Diesel	0.03	0.62	0.05	0.00	0.00	0.00	152	0.01	-	0.00
2036_Forklift_Diesel	0.07	2.66	0.25	0.01	0.01	0.01	805	0.01	-	0.01
2036_Forklift_Diesel	0.08	1.37	0.12	0.01	0.00	0.00	334	0.01	-	0.01
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	0.00	0.07	0.02	0.00	0.00	0.00	67.94	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	2.23	6.83	1.33	0.08	0.07	0.03	2,548.67	0.09	-	0.08
2036_Rub-trd Gantry Crane_Diesel	0.08	0.45	0.12	0.00	0.00	0.00	333.32	0.01	-	0.00
2036_Rub-trd Gantry Crane_Diesel	0.45	2.20	0.56	0.02	0.02	0.02	1,514.53	0.06	-	0.02
2036_Rub-trd Gantry Crane_Diesel	0.01	0.06	0.02	0.00	0.00	0.00	45.41	0.00	-	0.00
2036_Top handler_Diesel	0.81	10.71	2.92	0.10	0.09	0.11	9,519.06	0.12	-	0.10
2036_Top handler_Diesel	0.34	4.41	1.20	0.04	0.04	0.04	3,897.46	0.05	-	0.04
2036_Top handler_Diesel	4.12	16.86	3.71	0.18	0.17	0.09	9,128.61	0.33	-	0.18
2036_Top handler_Diesel	19.12	68.27	14.28	0.76	0.70	0.31	31,927.98	1.16	-	0.76
2036_Top handler_Diesel	5.43	15.64	3.67	0.20	0.19	0.08	7,711.06	0.28	-	0.20
2036_Top handler_Diesel	1.57	5.18	1.25	0.06	0.06	0.03	2,895.13	0.11	-	0.06
2036_Yard tractor_CNG (ultra-low NOx)	0.35	55.65	0.37	0.07	0.07	-	17,250.22	20.77	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.47	75.79	0.51	0.10	0.10	-	23,495.90	28.30	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.40	64.86	0.43	0.09	0.09	-	20,105.38	24.21	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.16	25.18	0.17	0.03	0.03	-	7,806.73	9.40	-	-
2036_Sweeper_Diesel	0.11	2.06	0.05	0.01	0.01	0.00	418.19	0.02	-	0.01
2036_Truck_Diesel	0.29	1.67	0.40	0.02	0.02	0.01	1,133.08	0.04	-	0.02
2036_Truck_Diesel	0.48	2.52	0.60	0.03	0.02	0.02	1,636.07	0.06	-	0.03
2036_Truck_Diesel	0.08	0.83	0.22	0.01	0.01	0.01	697.77	0.01	-	0.01

1hr/24hr Peaking Factor*: 0.073685169

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

Table B1-90. 2036 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2036_Forklift_Diesel	0.00	0.09	0.01	0.00	0.00	0.00	21	0.00	-	0.00
2036_Forklift_Diesel	0.01	0.37	0.03	0.00	0.00	0.00	112	0.00	-	0.00
2036_Forklift_Diesel	0.01	0.19	0.02	0.00	0.00	0.00	46	0.00	-	0.00
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2036_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	9.45	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	0.31	0.95	0.19	0.01	0.01	0.00	354.53	0.01	-	0.01
2036_Rub-trd Gantry Crane_Diesel	0.01	0.06	0.02	0.00	0.00	0.00	46.37	0.00	-	0.00
2036_Rub-trd Gantry Crane_Diesel	0.06	0.31	0.08	0.00	0.00	0.00	210.68	0.01	-	0.00
2036_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	6.32	0.00	-	0.00
2036_Top handler_Diesel	0.11	1.49	0.41	0.01	0.01	0.01	1,324.13	0.02	-	0.01
2036_Top handler_Diesel	0.05	0.61	0.17	0.01	0.01	0.01	542.15	0.01	-	0.01
2036_Top handler_Diesel	0.57	2.35	0.52	0.03	0.02	0.01	1,269.82	0.05	-	0.03
2036_Top handler_Diesel	2.66	9.50	1.99	0.11	0.10	0.04	4,441.28	0.16	-	0.11
2036_Top handler_Diesel	0.76	2.18	0.51	0.03	0.03	0.01	1,072.63	0.04	-	0.03
2036_Top handler_Diesel	0.22	0.72	0.17	0.01	0.01	0.00	402.72	0.01	-	0.01
2036_Yard tractor_CNG (ultra-low NOx)	0.05	7.74	0.05	0.01	0.01	-	2,399.56	2.89	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.07	10.54	0.07	0.01	0.01	-	3,268.35	3.94	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.06	9.02	0.06	0.01	0.01	-	2,796.72	3.37	-	-
2036_Yard tractor_CNG (ultra-low NOx)	0.02	3.50	0.02	0.00	0.00	-	1,085.94	1.31	-	-
2036_Sweeper_Diesel	0.02	0.29	0.01	0.00	0.00	0.00	58.17	0.00	-	0.00
2036_Truck_Diesel	0.04	0.23	0.06	0.00	0.00	0.00	157.61	0.01	-	0.00
2036_Truck_Diesel	0.07	0.35	0.08	0.00	0.00	0.00	227.58	0.01	-	0.00
2036_Truck_Diesel	0.01	0.12	0.03	0.00	0.00	0.00	97.06	0.00	-	0.00

WBICTF CARGO HANDLING EQUIPMENT PARAMETERS

Analysis Year	2045

Table B1-91. 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	Emission Controls (% reduction) PM	HC	CO
Forklift	137	2038	Diesel	0.3	1		0%	917	0%	0%	0%
Forklift	152	2036	Diesel	0.3	2		0%	4,377	0%	0%	0%
Forklift	152	2037	Diesel	0.3	2		0%	1,815	0%	0%	0%
Forklift	75	0	Electric	0.3	1		0%	412	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	1,594	0%	0%	0%
Forklift	160	0	Electric	0.3	2		0%	417	0%	0%	0%
Forklift	165	0	Electric	0.3	2		0%	558	0%	0%	0%
Rub-trd Gantry Crane	197	2035	Diesel	0.2	1		0%	428	0%	0%	0%
Rub-trd Gantry Crane	197	2039	Diesel	0.2	5		0%	16,040	0%	0%	0%
Rub-trd Gantry Crane	197	2024	Diesel	0.2	2		0%	2,099	0%	0%	0%
Rub-trd Gantry Crane	197	2022	Diesel	0.2	8		0%	9,764	0%	0%	0%
Rub-trd Gantry Crane	197	2026	Diesel	0.2	1		0%	279	0%	0%	0%
Top handler	250	2036	Diesel	0.59	8		0%	16,014	0%	0%	0%
Top handler	260	2036	Diesel	0.59	3		0%	6,318	0%	0%	0%
Top handler	260	2038	Diesel	0.59	8		0%	14,753	0%	0%	0%
Top handler	260	2040	Diesel	0.59	15		0%	51,633	0%	0%	0%
Top handler	335	2040	Diesel	0.59	3		0%	9,678	0%	0%	0%
Top handler	370	2040	Diesel	0.59	1		0%	3,290	0%	0%	0%
Yard tractor	195	2044	CNG (ultra-low NOx)	0.39	53		0%	103,154	0%	0%	0%
Yard tractor	195	2044	CNG (ultra-low NOx)	0.39	59		0%	140,503	0%	0%	0%
Yard tractor	195	2036	CNG (ultra-low NOx)	0.39	43		0%	120,228	0%	0%	0%
Yard tractor	231	2036	CNG (ultra-low NOx)	0.39	23		0%	39,408	0%	0%	0%
Sweeper	100	2041	Diesel	0.68	1		0%	1,526	0%	0%	0%
Truck	250	2037	Diesel	0.51	2		0%	2,205	0%	0%	0%
Truck	250	2040	Diesel	0.51	2		0%	3,182	0%	0%	0%
Truck	275	2033	Diesel	0.51	1		0%	1,235	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 B1-92. 2045 Proposed Mitigated Scenario - CHE Emission Factor

	Emission Factors (g/hp-hr)								
General name	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O
2045_Forklift_Diesel_137_2038	0.123	3.107	0.275	0.011	0.010	0.010	852.458	0.018	-
2045_Forklift_Diesel_152_2036	0.263	3.917	0.313	0.015	0.014	0.010	852.462	0.025	-
2045_Forklift_Diesel_152_2037	0.131	3.157	0.278	0.011	0.010	0.010	852.437	0.022	-
2045_Forklift_Electric_75_0	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric_160_0	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric_165_0	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel_197_2035	0.228	1.267	0.304	0.013	0.012	0.010	852.408	0.024	-
2045_Rub-trd Gantry Crane_Diesel_197_2039	0.243	1.296	0.308	0.013	0.012	0.010	852.505	0.014	-
2045_Rub-trd Gantry Crane_Diesel_197_2024	0.264	1.232	0.314	0.014	0.013	0.008	852.132	0.031	-
2045_Rub-trd Gantry Crane_Diesel_197_2022	0.300	1.286	0.324	0.015	0.014	0.009	876.296	0.032	-
2045_Rub-trd Gantry Crane_Diesel_197_2026	0.234	1.187	0.306	0.013	0.012	0.008	828.585	0.030	-
2045_Top handler_Diesel_250_2036	0.249	1.308	0.310	0.014	0.012	0.010	852.875	0.021	-
2045_Top handler_Diesel_260_2036	0.262	1.333	0.313	0.014	0.013	0.008	850.218	0.021	-
2045_Top handler_Diesel_260_2038	0.270	1.348	0.315	0.014	0.013	0.008	852.962	0.016	-
2045_Top handler_Diesel_260_2040	0.388	1.582	0.348	0.017	0.016	0.008	852.777	0.011	-
2045_Top handler_Diesel_335_2040	0.309	1.299	0.326	0.015	0.014	0.008	852.777	0.011	-
2045_Top handler_Diesel_370_2040	0.277	1.252	0.318	0.014	0.013	0.008	852.777	0.011	-
2045_Yard tractor_CNG (ultra-low NOx)_195_2044	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2045_Yard tractor_CNG (ultra-low NOx)_195_2044	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2045_Yard tractor_CNG (ultra-low NOx)_195_2036	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2045_Yard tractor_CNG (ultra-low NOx)_231_2036	0.009	1.500	0.010	0.002	0.002	-	465.000	0.560	-
2045_Sweeper_Diesel_100_2041	0.126	3.530	0.102	0.011	0.010	0.010	852.433	0.015	-
2045_Truck_Diesel_250_2037	0.148	1.107	0.282	0.011	0.010	0.010	852.461	0.018	-
2045_Truck_Diesel_250_2040	0.144	1.100	0.281	0.011	0.010	0.010	852.638	0.011	-
2045_Truck_Diesel_275_2033	0.206	1.223	0.298	0.012	0.011	0.008	854.081	0.028	-

Table B1-93. 2045 Proposed Mitigated Scenario Annual Mass Emissions

General name	(HP-Hrs)/Yr	Annual Emissions (tons/year) VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2045_Forklift_Diesel	37,704	0.01	0.13	0.01	0.00	0.00	0.00	35	0.00	-	0.00
2045_Forklift_Diesel	199,607	0.06	0.86	0.07	0.00	0.00	0.00	188	0.01	-	0.00
2045_Forklift_Diesel	82,755	0.01	0.29	0.03	0.00	0.00	0.00	78	0.00	-	0.00
2045_Forklift_Electric	9,277	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	76,530	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	20,005	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	27,622	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	16,853	0.00	0.02	0.01	0.00	0.00	0.00	16	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	631,983	0.17	0.90	0.21	0.01	0.01	0.01	594	0.01	-	0.01
2045_Rub-trd Gantry Crane_Diesel	82,712	0.02	0.11	0.03	0.00	0.00	0.00	78	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	384,716	0.13	0.55	0.14	0.01	0.01	0.00	372	0.01	-	0.01
2045_Rub-trd Gantry Crane_Diesel	11,008	0.00	0.01	0.00	0.00	0.00	0.00	10	0.00	-	0.00
2045_Top handler_Diesel	2,362,055	0.65	3.41	0.81	0.04	0.03	0.02	2,221	0.05	-	0.04
2045_Top handler_Diesel	969,128	0.28	1.42	0.33	0.01	0.01	0.01	908	0.02	-	0.01
2045_Top handler_Diesel	2,263,034	0.67	3.36	0.79	0.04	0.03	0.02	2,128	0.04	-	0.04
2045_Top handler_Diesel	7,920,571	3.39	13.81	3.04	0.15	0.14	0.07	7,445	0.09	-	0.15
2045_Top handler_Diesel	1,912,931	0.65	2.74	0.69	0.03	0.03	0.02	1,798	0.02	-	0.03
2045_Top handler_Diesel	718,214	0.22	0.99	0.25	0.01	0.01	0.01	675	0.01	-	0.01
2045_Yard tractor_CNG (ultra-low NOx)	7,844,878	0.08	12.97	0.09	0.02	0.02	-	4,021	4.84	-	-
2045_Yard tractor_CNG (ultra-low NOx)	10,685,221	0.11	17.67	0.12	0.02	0.02	-	5,477	6.60	-	-
2045_Yard tractor_CNG (ultra-low NOx)	9,143,315	0.09	15.12	0.10	0.02	0.02	-	4,687	5.64	-	-
2045_Yard tractor_CNG (ultra-low NOx)	3,550,265	0.04	5.87	0.04	0.01	0.01	-	1,820	2.19	-	-
2045_Sweeper_Diesel	103,740	0.01	0.40	0.01	0.00	0.00	0.00	97	0.00	-	0.00
2045_Truck_Diesel	281,109	0.05	0.34	0.09	0.00	0.00	0.00	264	0.01	-	0.00
2045_Truck_Diesel	405,755	0.06	0.49	0.13	0.00	0.00	0.00	381	0.00	-	0.00
2045_Truck_Diesel	173,192	0.04	0.23	0.06	0.00	0.00	0.00	163	0.01	-	0.00

Table B1-94. 2045 Proposed Mitigated Scenario Peak Day Emissions

		Peak Day Emissions (lb/day)									
General name	Peak Day Factor	VOC	CO	NOx	PM10	PM25	SOx	CO2	CH4	N2O	DPM
2045_Forklift_Diesel	0.0040	0.04	1.05	0.09	0.00	0.00	0.00	287	0.01	-	0.00
2045_Forklift_Diesel	0.0040	0.47	6.98	0.56	0.03	0.03	0.02	1,519	0.05	-	0.03
2045_Forklift_Diesel	0.0040	0.10	2.33	0.21	0.01	0.01	0.01	630	0.02	-	0.01
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	0.0040	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.03	0.19	0.05	0.00	0.00	0.00	128.24	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	0.0040	1.37	7.31	1.74	0.08	0.07	0.05	4,809.66	0.08	-	0.08
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.20	0.91	0.23	0.01	0.01	0.01	629.20	0.02	-	0.01
2045_Rub-trd Gantry Crane_Diesel	0.0040	1.03	4.42	1.11	0.05	0.05	0.03	3,009.56	0.11	-	0.05
2045_Rub-trd Gantry Crane_Diesel	0.0040	0.02	0.12	0.03	0.00	0.00	0.00	81.43	0.00	-	0.00
2045_Top handler_Diesel	0.0040	5.26	27.58	6.53	0.29	0.26	0.20	17,984.05	0.44	-	0.29
2045_Top handler_Diesel	0.0040	2.27	11.53	2.71	0.12	0.11	0.07	7,355.69	0.18	-	0.12
2045_Top handler_Diesel	0.0040	5.45	27.23	6.37	0.28	0.26	0.17	17,231.88	0.32	-	0.28
2045_Top handler_Diesel	0.0040	27.46	111.86	24.60	1.21	1.11	0.59	60,298.17	0.75	-	1.21
2045_Top handler_Diesel	0.0040	5.28	22.19	5.57	0.26	0.24	0.14	14,562.87	0.18	-	0.26
2045_Top handler_Diesel	0.0040	1.78	8.03	2.04	0.09	0.08	0.05	5,467.66	0.07	-	0.09
2045_Yard tractor_CNG (ultra-low NOx)	0.0040	0.65	105.05	0.70	0.14	0.14	-	32,565.00	39.22	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.0040	0.89	143.08	0.95	0.19	0.19	-	44,355.59	53.42	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.0040	0.76	122.44	0.82	0.16	0.16	-	37,954.96	45.71	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.0040	0.29	47.54	0.32	0.06	0.06	-	14,737.56	17.75	-	-
2045_Sweeper_Diesel	0.0040	0.12	3.27	0.09	0.01	0.01	0.01	789.44	0.01	-	0.01
2045_Truck_Diesel	0.0040	0.37	2.78	0.71	0.03	0.03	0.02	2,139.25	0.05	-	0.03
2045_Truck_Diesel	0.0040	0.52	3.99	1.02	0.04	0.04	0.03	3,088.45	0.04	-	0.04
2045_Truck_Diesel	0.0040	0.32	1.89	0.46	0.02	0.02	0.01	1,320.50	0.04	-	0.02

8hr/24hr Peaking Factor*: 0.529716683

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

Table B1-95. 2045 Proposed Mitigated Scenario Eight Hour Peak Emissions

	Eight Hour Peak Emissions (lb/8hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Forklift_Diesel	0.02	0.55	0.05	0.00	0.00	0.00	152	0.00	-	0.00
2045_Forklift_Diesel	0.25	3.70	0.30	0.01	0.01	0.01	805	0.02	-	0.01
2045_Forklift_Diesel	0.05	1.24	0.11	0.00	0.00	0.00	334	0.01	-	0.00
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	0.02	0.10	0.02	0.00	0.00	0.00	67.93	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	0.73	3.87	0.92	0.04	0.04	0.03	2,547.76	0.04	-	0.04
2045_Rub-trd Gantry Crane_Diesel	0.10	0.48	0.12	0.01	0.01	0.00	333.30	0.01	-	0.01
2045_Rub-trd Gantry Crane_Diesel	0.55	2.34	0.59	0.03	0.02	0.02	1,594.21	0.06	-	0.03
2045_Rub-trd Gantry Crane_Diesel	0.01	0.06	0.02	0.00	0.00	0.00	43.13	0.00	-	0.00
2045_Top handler_Diesel	2.78	14.61	3.46	0.15	0.14	0.11	9,526.45	0.23	-	0.15
2045_Top handler_Diesel	1.20	6.11	1.44	0.06	0.06	0.04	3,896.43	0.09	-	0.06
2045_Top handler_Diesel	2.88	14.42	3.38	0.15	0.14	0.09	9,128.02	0.17	-	0.15
2045_Top handler_Diesel	14.54	59.25	13.03	0.64	0.59	0.31	31,940.95	0.40	-	0.64
2045_Top handler_Diesel	2.80	11.75	2.95	0.14	0.13	0.08	7,714.20	0.10	-	0.14
2045_Top handler_Diesel	0.94	4.25	1.08	0.05	0.04	0.03	2,896.31	0.04	-	0.05
2045_Yard tractor_CNG (ultra-low NOx)	0.35	55.65	0.37	0.07	0.07	-	17,250.22	20.77	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.47	75.79	0.51	0.10	0.10	-	23,495.90	28.30	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.40	64.86	0.43	0.09	0.09	-	20,105.38	24.21	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.16	25.18	0.17	0.03	0.03	-	7,806.73	9.40	-	-
2045_Sweeper_Diesel	0.06	1.73	0.05	0.01	0.00	0.00	418.18	0.01	-	0.01
2045_Truck_Diesel	0.20	1.47	0.37	0.01	0.01	0.01	1,133.20	0.02	-	0.01
2045_Truck_Diesel	0.28	2.11	0.54	0.02	0.02	0.02	1,636.00	0.02	-	0.02
2045_Truck_Diesel	0.17	1.00	0.24	0.01	0.01	0.01	699.49	0.02	-	0.01

1hr/24hr Peaking Factor*: 0.073685169

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

Table B1-96. 2045 Proposed Mitigated Scenario One Hour Peak Emissions

	One Hour Peak Emissions (lb/1hr-period)									
General name	**VOC**	**CO**	**NOx**	**PM10**	**PM25**	**SOx**	**CO2**	**CH4**	**N2O**	**DPM**
2045_Forklift_Diesel	0.00	0.08	0.01	0.00	0.00	0.00	21	0.00	-	0.00
2045_Forklift_Diesel	0.03	0.51	0.04	0.00	0.00	0.00	112	0.00	-	0.00
2045_Forklift_Diesel	0.01	0.17	0.02	0.00	0.00	0.00	46	0.00	-	0.00
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Forklift_Electric	-	-	-	-	-	-	-	-	-	-
2045_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	9.45	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	0.10	0.54	0.13	0.01	0.01	0.00	354.40	0.01	-	0.01
2045_Rub-trd Gantry Crane_Diesel	0.01	0.07	0.02	0.00	0.00	0.00	46.36	0.00	-	0.00
2045_Rub-trd Gantry Crane_Diesel	0.08	0.33	0.08	0.00	0.00	0.00	221.76	0.01	-	0.00
2045_Rub-trd Gantry Crane_Diesel	0.00	0.01	0.00	0.00	0.00	0.00	6.00	0.00	-	0.00
2045_Top handler_Diesel	0.39	2.03	0.48	0.02	0.02	0.01	1,325.16	0.03	-	0.02
2045_Top handler_Diesel	0.17	0.85	0.20	0.01	0.01	0.01	542.01	0.01	-	0.01
2045_Top handler_Diesel	0.40	2.01	0.47	0.02	0.02	0.01	1,269.73	0.02	-	0.02
2045_Top handler_Diesel	2.02	8.24	1.81	0.09	0.08	0.04	4,443.08	0.06	-	0.09
2045_Top handler_Diesel	0.39	1.63	0.41	0.02	0.02	0.01	1,073.07	0.01	-	0.02
2045_Top handler_Diesel	0.13	0.59	0.15	0.01	0.01	0.00	402.89	0.01	-	0.01
2045_Yard tractor_CNG (ultra-low NOx)	0.05	7.74	0.05	0.01	0.01	-	2,399.56	2.89	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.07	10.54	0.07	0.01	0.01	-	3,268.35	3.94	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.06	9.02	0.06	0.01	0.01	-	2,796.72	3.37	-	-
2045_Yard tractor_CNG (ultra-low NOx)	0.02	3.50	0.02	0.00	0.00	-	1,085.94	1.31	-	-
2045_Sweeper_Diesel	0.01	0.24	0.01	0.00	0.00	0.00	58.17	0.00	-	0.00
2045_Truck_Diesel	0.03	0.20	0.05	0.00	0.00	0.00	157.63	0.00	-	0.00
2045_Truck_Diesel	0.04	0.29	0.08	0.00	0.00	0.00	227.57	0.00	-	0.00
2045_Truck_Diesel	0.02	0.14	0.03	0.00	0.00	0.00	97.30	0.00	-	0.00

Ocean-Going Vessels (OGVs)

Table B1-97. 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 B1-98. 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 B1-99. 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 B1-100. Ocean Going Vessel Greenhouse Gas Emission Factors by Tier Level for Auxiliary Engines

Auxiliary Engine	IMO Tier	Model Year	CO2 gm/kw-hr	N2O gm/kw-hr	CH4 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 B1-101. 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 B1-102. 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 B1-103. 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 B1-104. Non-MAN Engine Low-Load Adjusments 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 B1-105. Vessel Transit Zones and Locations - FEIR Mitigated

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 B1-106. Annual Average Cargo Vessel Activities - 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
Base Year 2008	-	-	-	-	-	-	-	-	-
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	0%	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-		
Containerships 8,000 - 9,000 TEU	4	2.0	2	2	1	2	84	100%	5.14
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-		
Containerships 5,000 - 6,000 TEU	28	2.0	14	14	-	-	61	89%	3.42
Containerships 4,000 - 5,000 TEU	18	2.0	9	9	2	6	59	0.89	
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	1	2.0	0.5	0.5	-	-	54.5	-	3.0
Containerships 1,000 - 2,000 TEU	0	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-
Total	51	-	26	26	3	-	-	0.9	-
Project Year 2012	-	-	-	-	-	-	-	-	-
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	0%	-
Containerships 9,000 - 10,000 TEU	42	2.0	21	21	2	22	75		
Containerships 8,000 - 9,000 TEU	9	2.0	5	5	-	-	73	100%	3.94
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-		
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	0%	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-
Total	1	2.0	-	1	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-
Project Year 2018	-	-	-	-	-	-	-	-	-
Containerships 11,000 - 12,000 TEU	4	2.0	2	2	-	-	157	100%	4.20
Containerships 10,000 - 11,000 TEU	4	2.0	2	2	-	-	118		
Containerships 9,000 - 10,000 TEU	4	2.0	2	2	-	-	108	100%	9.90
Containerships 8,000 - 9,000 TEU	40	2.0	20	20	-	-	86		
Containerships 7,000 - 8,000 TEU	12	2.0	6	6	-	-	77	100%	5.68
Containerships 6,000 - 7,000 TEU	108	2.0	54	54	5	4	75	1.00	
Containerships 5,000 - 6,000 TEU	12	2.0	6.0	6.0	-	-	64.0	1.00	3.7
Containerships 4,000 - 5,000 TEU	96	2.0	48.0	48.0	1.0	10.2	37.0	1.0	6.6
Containerships 3,000 - 4,000 TEU	0	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-
Total	280	2.0	140	140	6	4.7	90.2	1.0	5.7
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 B1-107. Transit Parameters - FEIR Mitigated

Parameter	Maneuvering 2	PZ 3	20nm 4	40nm 5
Base Year 2008				
Average Speed	5	11	10.96	15.38
AverageTime	1.1	0.7	2.0	1.4
VRSP Compliant Average Speed (knots)	NA	NA	10.76	10.88
VRSP Non-Compliant Average Speed (knots)	NA	NA	13.65	17.60
VSRP Compliance Rate (% transits)	NA	NA	97%	24%
Distance in miles (from CS DEIR 2008)	3.9	8.2	15.8	24.1
Project Year 2012				
Average Speed	5	11	11.04	14.30
AverageTime	1.1	0.8	1.9	1.6
VRSP Compliant Average Speed (knots)	NA	NA	10.64	10.31
VRSP Non-Compliant Average Speed (knots)	NA	NA	13.00	16.58
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
Distance in miles (from CS DEIR 2008)	3.9	8.2	15.8	24.1
Project Year 2014				
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
Project Year 2018				
Average Speed	6.5	9	10.44	10.96
AverageTime	0.6	0.9	1.5	2.2
VRSP Compliant Average Speed (knots)	NA	NA	10.32	10.57
VRSP Non-Compliant Average Speed (knots)	NA	NA	13.13	15.14
VSRP Compliance Rate (% transits)	NA	NA	100%	100%
Distance in miles (from CS DEIR 2008)	3.9	8.2	15.8	24.1
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 B1-108. Peak Day Activity for Ocean Going Vessels - 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**
Base Year 2008									
Containerships 5,000 - 6,000 TEU	5000	2008	0	1	1	23	23	0	0
Project Year 2012									
Containerships 9,000 - 10,000 TEU	9000	2012	0	1	1	23	1.97	0	0
Project Year 2014									
Containerships 10,000 - 11,000 TEU	10000	2014	1	1	2	6.3	17.5	0	0
Containerships 9,000 - 10,000 TEU	9000	2014	0	0	0	24	0	24	0
Project Year 2018									
Containerships 9,000 - 10,000 TEU	9000	2018	0	1	1	24	0	0	0
Containerships 6,000 - 7,000 TEU	6000	2018	1	1	2	24	6.09	4.70	1
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 B1-109. Engine Loads by Zone for 2008 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	937	393
	Containerships 4,000 - 5,000 TEU	-	1,188	519
	Containerships 5,000 - 6,000 TEU	-	991	590
	Containerships 8,000 - 9,000 TEU	-	1,080	586
Manuevering	Containerships 2,000 - 3,000 TEU	861	1,973	393
	Containerships 4,000 - 5,000 TEU	1,082	2,524	519
	Containerships 5,000 - 6,000 TEU	1,329	3,427	590
	Containerships 8,000 - 9,000 TEU	1,652	3,480	586
Precautionary Area	Containerships 2,000 - 3,000 TEU	2,680	888	393
	Containerships 4,000 - 5,000 TEU	3,477	1,410	519
	Containerships 5,000 - 6,000 TEU	4,237	1,029	590
	Containerships 8,000 - 9,000 TEU	5,836	1,560	586
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	2,506	888	262
	Containerships 4,000 - 5,000 TEU	3,251	1,410	502
	Containerships 5,000 - 6,000 TEU	3,962	1,029	587
	Containerships 8,000 - 9,000 TEU	5,457	1,560	586
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	5,121	888	262
	Containerships 4,000 - 5,000 TEU	6,644	1,410	502
	Containerships 5,000 - 6,000 TEU	8,096	1,029	587
	Containerships 8,000 - 9,000 TEU	11,152	1,560	586
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	2,590	888	49
	Containerships 4,000 - 5,000 TEU	3,360	1,410	260
	Containerships 5,000 - 6,000 TEU	4,094	1,029	387
	Containerships 8,000 - 9,000 TEU	5,639	1,560	410
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	10,976	888	49
	Containerships 4,000 - 5,000 TEU	14,240	1,410	260
	Containerships 5,000 - 6,000 TEU	17,352	1,029	387
	Containerships 8,000 - 9,000 TEU	23,901	1,560	410
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	1,292	519
	Containerships 5,000 - 6,000 TEU	-	-	-
	Containerships 8,000 - 9,000 TEU	-	1,560	586

Table B1-110. Engine Loads by Zone for 2012 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 8,000 - 9,000 TEU	-	927	525
	Containerships 9,000 - 10,000 TEU	-	1,040	547
Manuevering	Containerships 8,000 - 9,000 TEU	1,860	2,785	525
	Containerships 9,000 - 10,000 TEU	1,822	3,350	547
Precautionary Area	Containerships 8,000 - 9,000 TEU	5,790	1,515	525
	Containerships 9,000 - 10,000 TEU	5,699	1,502	547
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 8,000 - 9,000 TEU	5,237	1,515	525
	Containerships 9,000 - 10,000 TEU	5,155	1,502	532
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 8,000 - 9,000 TEU	5,237	1,515	525
	Containerships 9,000 - 10,000 TEU	5,155	1,502	532
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 8,000 - 9,000 TEU	4,771	1,515	225
	Containerships 9,000 - 10,000 TEU	4,696	1,502	321
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 8,000 - 9,000 TEU	4,771	1,515	225
	Containerships 9,000 - 10,000 TEU	4,696	1,502	321
Anchorage	Containerships 8,000 - 9,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	-	1,502	547

Table B1-111. 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 B1-112. Engine Loads by Zone for 2018 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 4,000 - 5,000 TEU	-	1,161	492
	Containerships 5,000 - 6,000 TEU	-	1,028	629
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 6,000 - 7,000 TEU	-	990	573
	Containerships 10,000 - 11,000 TEU	-	1,131	708
	Containerships 7,000 - 8,000 TEU	-	2,456	623
	Containerships 11,000 - 12,000 TEU	-	1,500	790
Manuevering	Containerships 4,000 - 5,000 TEU	1,186	2,526	492
	Containerships 5,000 - 6,000 TEU	996	3,807	629
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 6,000 - 7,000 TEU	1,604	2,197	573
	Containerships 10,000 - 11,000 TEU	1,868	2,105	708
	Containerships 7,000 - 8,000 TEU	1,303	3,086	470
	Containerships 11,000 - 12,000 TEU	2,600	3,500	575
Precautionary Area	Containerships 4,000 - 5,000 TEU	3,691	1,434	492
	Containerships 5,000 - 6,000 TEU	2,279	1,278	629
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 7,000 - 8,000 TEU	2,982	1,107	259
	Containerships 11,000 - 12,000 TEU	5,950	2,500	330
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 4,000 - 5,000 TEU	5,569	1,434	492
	Containerships 5,000 - 6,000 TEU	3,438	1,278	629
	Containerships 8,000 - 9,000 TEU	8,321	1,597	531
	Containerships 9,000 - 10,000 TEU	8,478	1,501	475
	Containerships 6,000 - 7,000 TEU	7,602	1,453	573
	Containerships 10,000 - 11,000 TEU	8,804	1,730	708
	Containerships 7,000 - 8,000 TEU	4,500	1,107	259
	Containerships 11,000 - 12,000 TEU	8,977	2,500	330
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 4,000 - 5,000 TEU	5,569	1,434	492
	Containerships 5,000 - 6,000 TEU	3,438	1,278	629
	Containerships 8,000 - 9,000 TEU	8,321	1,597	531
	Containerships 9,000 - 10,000 TEU	8,478	1,501	475
	Containerships 6,000 - 7,000 TEU	7,602	1,453	573
	Containerships 10,000 - 11,000 TEU	8,804	1,730	708
	Containerships 7,000 - 8,000 TEU	4,500	1,107	259
	Containerships 11,000 - 12,000 TEU	8,977	2,500	330
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 4,000 - 5,000 TEU	5,974	1,434	464
	Containerships 5,000 - 6,000 TEU	3,688	1,278	381
	Containerships 8,000 - 9,000 TEU	8,926	1,597	531
	Containerships 9,000 - 10,000 TEU	9,095	1,501	475
	Containerships 6,000 - 7,000 TEU	8,155	1,453	573
	Containerships 10,000 - 11,000 TEU	9,445	1,730	708
	Containerships 7,000 - 8,000 TEU	4,827	1,107	259
	Containerships 11,000 - 12,000 TEU	9,630	2,500	330
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 4,000 - 5,000 TEU	5,974	1,434	464
	Containerships 5,000 - 6,000 TEU	3,688	1,278	381
	Containerships 8,000 - 9,000 TEU	8,926	1,597	531
	Containerships 9,000 - 10,000 TEU	9,095	1,501	475
	Containerships 6,000 - 7,000 TEU	8,155	1,453	573
	Containerships 10,000 - 11,000 TEU	9,445	1,730	708
	Containerships 7,000 - 8,000 TEU	4,827	1,107	259
	Containerships 11,000 - 12,000 TEU	9,630	2,500	330
Anchorage	Containerships 4,000 - 5,000 TEU	-	1,200	472
	Containerships 6,000 - 7,000 TEU	-	1,645	611

Table B1-113. Engine Loads by Zone for 2023 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	Containerships 12,000 - 13,000 TEU	-	982	599
Manuevering	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
Precautionary Area	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
Anchorage	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	Containerships 12,000 - 13,000 TEU	-	1,865	599

Table B1-114. Engine Loads by Zone for 2030 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 12,000 - 13,000 TEU	-	982	599
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Anchorage	Containerships 9,000 - 10,000 TEU	-	1,501	475
	Containerships 12,000 - 13,000 TEU	-	1,865	599
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-115. Engine Loads by Zone for 2036 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 12,000 - 13,000 TEU	-	982	599
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Anchorage	Containerships 9,000 - 10,000 TEU	-	1,501	475
	Containerships 12,000 - 13,000 TEU	-	1,865	599
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-116. Engine Loads by Zone for 2045 - FEIR Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 12,000 - 13,000 TEU	-	982	599
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Anchorage	Containerships 9,000 - 10,000 TEU	-	1,501	475
	Containerships 12,000 - 13,000 TEU	-	1,865	599
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-117. Annual OGVs Emissions in TPY for year 2008 - 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)
2008	anchorage	0.05	0.04	0.04	0.46	0.42	0.03	0.04	0.00	26.49	0.00
	hotelling	1.18	0.94	0.39	5.86	19.34	0.22	0.51	0.00	1162.11	0.09
	transit	2.78	2.22	2.68	48.46	23.39	2.39	3.45	0.02	1413.80	0.08
Grand Total		**4.00**	**3.20**	**3.11**	**54.78**	**43.14**	**2.63**	**4.00**	**0.03**	**2602.41**	**0.17**

Table B1-118. Peak Daily OGVs Emissions in tons/day for year 2008 - 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)
2008	Fairway: AQMD Overwater Boundary to 20-Mile - Without \	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - Without VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Precautionary Area	0.00	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.95	0.00
	Manuevering	0.00	0.01	0.02	0.17	0.01	0.01	0.05	0.00	3.31	0.00
	Anchorage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Berthing	0.03	0.03	0.01	0.35	0.04	0.04	0.51	0.00	32.49	0.00
Grand Total		**0.04**	**0.04**	**0.03**	**0.57**	**0.05**	**0.04**	**0.58**	**0.00**	**36.75**	**0.00**

Table B1-119. Annual OGVs Emissions in TPY for year 2012 - 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)
2012	anchorage	0.03	0.03	0.03	1.05	0.17	0.05	0.11	0.00	76.45	0.00
	hotelling	0.23	0.22	0.15	3.65	2.23	0.44	1.02	0.00	1124.14	0.09
	transit	0.96	0.89	0.95	44.19	2.55	3.57	5.40	0.02	1291.05	0.07
Grand Total		1.22	1.13	1.13	48.89	4.95	4.07	6.53	0.03	2491.64	0.16

Table B1-120. Peak Daily OGVs Emissions in tons/day for year 2012 - 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)
2012	Fairway: AQMD Overwater Boundary to 20-Mile - Without \	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - Without VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Precautionary Area	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	1.18	0.00
	Manuevering	0.02	0.00	0.01	0.12	0.00	0.00	0.01	0.00	3.33	0.00
	Anchorage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Berthing	0.01	0.00	0.01	0.06	0.00	0.00	0.03	0.00	14.33	0.00
Grand Total		0.04	0.01	0.02	0.21	0.01	0.01	0.04	0.00	18.85	0.00

Table B1-121. 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 B1-122. 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 B1-123. Annual OGVs Emissions in TPY for year 2018 - 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)
2018	anchorage	0.02	0.02	0.02	0.91	0.04	0.05	0.07	0.00	53.82	0.00
	hotelling	1.07	0.99	0.28	23.96	3.96	1.00	2.31	0.02	5968.39	0.46
	transit	3.05	2.81	2.93	277.44	5.55	14.86	19.52	0.14	8355.12	0.52
Grand Total		**4.14**	**3.82**	**3.22**	**302.31**	**9.54**	**15.91**	**21.90**	**0.16**	**14377.33**	**0.98**

Table B1-124. Peak Daily OGVs Emissions in tons/day for year 2018 - 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)
2018	Fairway: AQMD Overwater Boundary to 20-Mile - Without \	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	0.01	0.00	0.03	0.45	0.00	0.00	0.01	0.00	9.22	0.00
	Fairway: 20-Mile to Precautionary Area - Without VSR	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	1.82	0.00
	Fairway: 20-Mile to Precautionary Area - With VSR	0.01	0.00	0.02	0.35	0.00	0.00	0.01	0.00	7.54	0.00
	Precautionary Area	0.01	0.00	0.02	0.37	0.00	0.00	0.01	0.00	9.04	0.00
	Manuevering	0.01	0.00	0.05	0.48	0.00	0.00	0.01	0.00	8.06	0.00
	Anchorage	0.03	0.01	0.03	0.44	0.01	0.01	0.01	0.00	21.41	0.00
	Berthing	0.01	0.00	0.01	0.13	0.01	0.01	0.02	0.00	30.00	0.00
Grand Total		**0.08**	**0.02**	**0.16**	**2.29**	**0.03**	**0.02**	**0.06**	**0.00**	**87.09**	**0.01**

Table B1-125. 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 B1-126. 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 B1-127. 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 B1-128. 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 B1-129. 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 B1-130. 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 B1-131. 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 B1-132. 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 B1-133. Vessel Transit Zones and Locations - Proposed Mitigated

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 B1-134. Annual Average Cargo Vessel Activities - 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 2008	-	-	-	-	-	-	-	-	-
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	0%	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-		
Containerships 8,000 - 9,000 TEU	4	2.0	2	2	1	2	84	100%	5.14
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-		
Containerships 5,000 - 6,000 TEU	28	2.0	14	14	-	-	61	89%	3.42
Containerships 4,000 - 5,000 TEU	18	2.0	9	9	2	6	59	0.89	
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	1	2.0	0.5	0.5	-	-	54.5	-	-
Containerships 1,000 - 2,000 TEU	0	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-
Total	51	-	26	26	3	-	-	0.9	-
Project Year 2012	-	-	-	-	-	-	-	-	-
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	0%	-
Containerships 9,000 - 10,000 TEU	42	2.0	21	21	2	22	75		
Containerships 8,000 - 9,000 TEU	9	2.0	5	5	-	-	73	67%	3.94
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-		
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	0%	-
Containerships 4,000 - 5,000 TEU	-	-	-	-	-	-	-	-	
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	-	-	-	-	-	-	-	-	-
Containerships 1,000 - 2,000 TEU	0	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-
Total	1	2.0	-	1	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-
Project Year 2018	-	-	-	-	-	-	-	-	-
Containerships 11,000 - 12,000 TEU	4	2.0	2	2	-	-	157	100%	4.20
Containerships 10,000 - 11,000 TEU	4	2.0	2	2	-	-	118		
Containerships 9,000 - 10,000 TEU	4	2.0	2	2	-	-	108	100%	9.90
Containerships 8,000 - 9,000 TEU	40	2.0	20	20	-	-	86		
Containerships 7,000 - 8,000 TEU	12	2.0	6	6	-	-	77	100%	5.68
Containerships 6,000 - 7,000 TEU	108	2.0	54	54	5	4	75	0.93	
Containerships 5,000 - 6,000 TEU	12	2.0	6.0	6.0	-	-	64.0	1.00	3.7
Containerships 4,000 - 5,000 TEU	96	2.0	48.0	48.0	1.0	10.2	37.0	1.0	6.6
Containerships 3,000 - 4,000 TEU	0	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-
Total	280	2.0	140	140	6	4.7	90.2	1.0	5.7
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 B1-135. Transit Parameters - Proposed Mitigated

Parameter	Maneuvering 2	PZ 3	20nm 4	40nm 5
Project Year 2008				
Average Speed	5	11	10.96	15.38
AverageTime	1.1	0.7	2.0	1.4
VRSP Compliant Average Speed (knots)	NA	NA	10.76	10.88
VRSP Non-Compliant Average Speed (knots)	NA	NA	13.65	17.60
VSRP Compliance Rate (% transits)	NA	NA	97%	24%
Distance in miles (from CS DEIR 2008)	3.9	8.2	15.8	24.1
Project Year 2012				
Average Speed	5	11	11.04	14.30
AverageTime	1.1	0.8	1.9	1.6
VRSP Compliant Average Speed (knots)	NA	NA	10.64	10.31
VRSP Non-Compliant Average Speed (knots)	NA	NA	13.00	16.58
VSRP Compliance Rate (% transits)	NA	NA	93%	47%
Distance in miles (from CS DEIR 2008)	3.9	8.2	15.8	24.1
Project Year 2014				
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
Project Year 2018				
Average Speed	6.5	9	10.44	10.96
AverageTime	0.6	0.9	1.5	2.2
VRSP Compliant Average Speed (knots)	NA	NA	10.32	10.57
VRSP Non-Compliant Average Speed (knots)	NA	NA	13.13	15.14
VSRP Compliance Rate (% transits)	NA	NA	96%	91%
Distance in miles (from CS DEIR 2008)	3.9	8.2	15.8	24.1
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 B1-136. Peak Day Activity for Ocean Going Vessels during - 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 2008									
Containerships 5,000 - 6,000 TEU	5000	2008	0	1	1	23	23	0	0
Project Year 2012									
Containerships 9,000 - 10,000 TEU	9000	2012	0	1	1	23	23	0	0
Project Year 2014									
Containerships 10,000 - 11,000 TEU	10000	0	1	1	2	6.3	17.5	0	0
Containerships 9,000 - 10,000 TEU	9000	0	0	0	0	24	0	24	0
Project Year 2018									
Containerships 9,000 - 10,000 TEU	9000	2018	0	1	1	24	0	0	0
Containerships 6,000 - 7,000 TEU	6000	2018	1	1	2	24	19	4.70	1
Project Year 2023									
Containerships 12,000 - 13,000 TEU	12000	2023	0	1	1	18	0	0	0
Containerships 5,000 - 6,000 TEU	5000	2023	0	1	1	18.3	0	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	12.13	0	0	0
Containerships 12,000 - 13,000 TEU	12000	2030	0	1	1	19.17	0	0	0
Containerships 9,000 - 10,000 TEU	9000	2030	1	0	1	6.33	0	7.39	1
Project Year 2036									
Containerships 7,000 - 8,000 TEU	7000	2036	0	1	1	12.13	0	0	0
Containerships 12,000 - 13,000 TEU	12000	2036	0	1	1	19.17	0	0	0
Containerships 9,000 - 10,000 TEU	9000	2036	1	0	1	6.33	0	7.39	1
Project Year 2045									
Containerships 7,000 - 8,000 TEU	7000	2045	0	1	1	12.13	0	0	0
Containerships 12,000 - 13,000 TEU	12000	2045	0	1	1	19.17	0	0	0
Containerships 9,000 - 10,000 TEU	9000	2045	1	0	1	6.33	0	7.39	1

Table B1-137. Engine Loads by Zone for 2008 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 2,000 - 3,000 TEU	-	937	393
	Containerships 4,000 - 5,000 TEU	-	1,188	519
	Containerships 5,000 - 6,000 TEU	-	991	590
	Containerships 8,000 - 9,000 TEU	-	1,080	586
Manuevering	Containerships 2,000 - 3,000 TEU	861	1,973	393
	Containerships 4,000 - 5,000 TEU	1,082	2,524	519
	Containerships 5,000 - 6,000 TEU	1,329	3,427	590
	Containerships 8,000 - 9,000 TEU	1,652	3,480	586
Precautionary Area	Containerships 2,000 - 3,000 TEU	2,680	888	393
	Containerships 4,000 - 5,000 TEU	3,477	1,410	519
	Containerships 5,000 - 6,000 TEU	4,237	1,029	590
	Containerships 8,000 - 9,000 TEU	5,836	1,560	586
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 2,000 - 3,000 TEU	2,506	888	262
	Containerships 4,000 - 5,000 TEU	3,251	1,410	502
	Containerships 5,000 - 6,000 TEU	3,962	1,029	587
	Containerships 8,000 - 9,000 TEU	5,457	1,560	586
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 2,000 - 3,000 TEU	5,121	888	262
	Containerships 4,000 - 5,000 TEU	6,644	1,410	502
	Containerships 5,000 - 6,000 TEU	8,096	1,029	587
	Containerships 8,000 - 9,000 TEU	11,152	1,560	586
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 2,000 - 3,000 TEU	2,590	888	49
	Containerships 4,000 - 5,000 TEU	3,360	1,410	260
	Containerships 5,000 - 6,000 TEU	4,094	1,029	387
	Containerships 8,000 - 9,000 TEU	5,639	1,560	410
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 2,000 - 3,000 TEU	10,976	888	49
	Containerships 4,000 - 5,000 TEU	14,240	1,410	260
	Containerships 5,000 - 6,000 TEU	17,352	1,029	387
	Containerships 8,000 - 9,000 TEU	23,901	1,560	410
Anchorage	Containerships 2,000 - 3,000 TEU	-	-	-
	Containerships 4,000 - 5,000 TEU	-	1,292	519
	Containerships 5,000 - 6,000 TEU	-	-	-
	Containerships 8,000 - 9,000 TEU	-	1,560	586

Table B1-138. Engine Loads by Zone for 2012 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 8,000 - 9,000 TEU	-	927	525
	Containerships 9,000 - 10,000 TEU	-	1,040	547
Manuevering	Containerships 8,000 - 9,000 TEU	1,860	2,785	525
	Containerships 9,000 - 10,000 TEU	1,822	3,350	547
Precautionary Area	Containerships 8,000 - 9,000 TEU	5,790	1,515	525
	Containerships 9,000 - 10,000 TEU	5,699	1,502	547
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 8,000 - 9,000 TEU	5,237	1,515	525
	Containerships 9,000 - 10,000 TEU	5,155	1,502	532
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 8,000 - 9,000 TEU	9,557	1,515	525
	Containerships 9,000 - 10,000 TEU	9,407	1,502	532
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 8,000 - 9,000 TEU	4,771	1,515	225
	Containerships 9,000 - 10,000 TEU	4,696	1,502	321
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 8,000 - 9,000 TEU	19,843	1,515	225
	Containerships 9,000 - 10,000 TEU	19,531	1,502	321
Anchorage	Containerships 8,000 - 9,000 TEU	-	-	-
	Containerships 9,000 - 10,000 TEU	-	1,502	547

Table B1-139. Engine Loads by Zone for 2014 - Proposed 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	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 B1-140. Engine Loads by Zone for 2018 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 4,000 - 5,000 TEU	-	1,161	492
	Containerships 5,000 - 6,000 TEU	-	1,028	629
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 6,000 - 7,000 TEU	-	990	573
	Containerships 10,000 - 11,000 TEU	-	1,131	708
	Containerships 7,000 - 8,000 TEU	-	2,456	623
	Containerships 11,000 - 12,000 TEU	-	1,500	790
Manuevering	Containerships 4,000 - 5,000 TEU	1,186	2,526	492
	Containerships 5,000 - 6,000 TEU	996	3,807	629
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 6,000 - 7,000 TEU	1,604	2,197	573
	Containerships 10,000 - 11,000 TEU	1,868	2,105	708
	Containerships 7,000 - 8,000 TEU	1,303	3,086	470
	Containerships 11,000 - 12,000 TEU	2,600	3,500	575
Precautionary Area	Containerships 4,000 - 5,000 TEU	3,691	1,434	492
	Containerships 5,000 - 6,000 TEU	2,279	1,278	629
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 6,000 - 7,000 TEU	5,039	1,453	573
	Containerships 10,000 - 11,000 TEU	5,836	1,730	708
	Containerships 7,000 - 8,000 TEU	2,982	1,107	259
	Containerships 11,000 - 12,000 TEU	5,950	2,500	330
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 4,000 - 5,000 TEU	5,569	1,434	492
	Containerships 5,000 - 6,000 TEU	3,438	1,278	629
	Containerships 8,000 - 9,000 TEU	8,321	1,597	531
	Containerships 9,000 - 10,000 TEU	8,478	1,501	475
	Containerships 6,000 - 7,000 TEU	7,602	1,453	573
	Containerships 10,000 - 11,000 TEU	8,804	1,730	708
	Containerships 7,000 - 8,000 TEU	4,500	1,107	259
	Containerships 11,000 - 12,000 TEU	8,977	2,500	330
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 4,000 - 5,000 TEU	11,463	1,434	492
	Containerships 5,000 - 6,000 TEU	7,077	1,278	629
	Containerships 8,000 - 9,000 TEU	17,129	1,597	531
	Containerships 9,000 - 10,000 TEU	17,452	1,501	475
	Containerships 6,000 - 7,000 TEU	15,648	1,453	573
	Containerships 10,000 - 11,000 TEU	18,124	1,730	708
	Containerships 7,000 - 8,000 TEU	9,263	1,107	259
	Containerships 11,000 - 12,000 TEU	18,480	2,500	330
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 4,000 - 5,000 TEU	5,974	1,434	464
	Containerships 5,000 - 6,000 TEU	3,688	1,278	381
	Containerships 8,000 - 9,000 TEU	8,926	1,597	531
	Containerships 9,000 - 10,000 TEU	9,095	1,501	475
	Containerships 6,000 - 7,000 TEU	8,155	1,453	573
	Containerships 10,000 - 11,000 TEU	9,445	1,730	708
	Containerships 7,000 - 8,000 TEU	4,827	1,107	259
	Containerships 11,000 - 12,000 TEU	9,630	2,500	330
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 4,000 - 5,000 TEU	17,562	1,434	464
	Containerships 5,000 - 6,000 TEU	10,843	1,278	381
	Containerships 8,000 - 9,000 TEU	26,242	1,597	531
	Containerships 9,000 - 10,000 TEU	26,737	1,501	475
	Containerships 6,000 - 7,000 TEU	23,974	1,453	573
	Containerships 10,000 - 11,000 TEU	27,767	1,730	708
	Containerships 7,000 - 8,000 TEU	14,191	1,107	259
	Containerships 11,000 - 12,000 TEU	28,312	2,500	330
Anchorage	Containerships 4,000 - 5,000 TEU	-	1,200	472
	Containerships 6,000 - 7,000 TEU	-	1,645	611

Table B1-141. Engine Loads by Zone for 2023 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 5,000 - 6,000 TEU	-	900	547
	Containerships 8,000 - 9,000 TEU	-	1,453	531
	Containerships 12,000 - 13,000 TEU	-	982	599
Manuevering	Containerships 5,000 - 6,000 TEU	1,363	3,367	547
	Containerships 8,000 - 9,000 TEU	1,783	2,993	531
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
Precautionary Area	Containerships 5,000 - 6,000 TEU	4,266	1,725	545
	Containerships 8,000 - 9,000 TEU	5,515	1,597	531
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 5,000 - 6,000 TEU	5,539	1,725	545
	Containerships 8,000 - 9,000 TEU	7,160	1,597	531
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 5,000 - 6,000 TEU	34,129	1,725	545
	Containerships 8,000 - 9,000 TEU	44,122	1,597	531
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
Anchorage	Containerships 5,000 - 6,000 TEU	-	1,725	547
	Containerships 8,000 - 9,000 TEU	-	1,470	531
	Containerships 12,000 - 13,000 TEU	-	1,865	599

Table B1-142. Engine Loads by Zone for 2030 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 12,000 - 13,000 TEU	-	982	599
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Anchorage	Containerships 9,000 - 10,000 TEU	-	1,501	475
	Containerships 12,000 - 13,000 TEU	-	1,865	599
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-143. Engine Loads by Zone for 2036 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 12,000 - 13,000 TEU	-	982	599
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Anchorage	Containerships 9,000 - 10,000 TEU	-	1,501	475
	Containerships 12,000 - 13,000 TEU	-	1,865	599
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-144. Engine Loads by Zone for 2045 - Proposed Mitigated

Zone Description	Vessel Size	Propulsion Engine (kW)	Auxiliary Engines (kW)	Boiler (kW)
Berthing	Containerships 9,000 - 10,000 TEU	-	1,037	475
	Containerships 12,000 - 13,000 TEU	-	982	599
	Containerships 7,000 - 8,000 TEU	-	1,372	551
Manuevering	Containerships 9,000 - 10,000 TEU	1,805	2,942	475
	Containerships 12,000 - 13,000 TEU	1,953	3,085	599
	Containerships 7,000 - 8,000 TEU	1,694	3,357	551
Precautionary Area	Containerships 9,000 - 10,000 TEU	5,619	1,501	475
	Containerships 12,000 - 13,000 TEU	6,156	1,865	599
	Containerships 7,000 - 8,000 TEU	5,277	1,444	538
Fairway: 20-Mile to Precautionary Area - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: 20-Mile to Precautionary Area - Without VSR	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	Containerships 9,000 - 10,000 TEU	7,295	1,501	475
	Containerships 12,000 - 13,000 TEU	7,992	1,865	599
	Containerships 7,000 - 8,000 TEU	6,851	1,444	538
Fairway: AQMD Overwater Boundary to 20-Mile - Without VSR	Containerships 9,000 - 10,000 TEU	44,954	1,501	475
	Containerships 12,000 - 13,000 TEU	49,250	1,865	599
	Containerships 7,000 - 8,000 TEU	42,215	1,444	538
Anchorage	Containerships 9,000 - 10,000 TEU	-	1,501	475
	Containerships 12,000 - 13,000 TEU	-	1,865	599
	Containerships 7,000 - 8,000 TEU	-	1,444	551

Table B1-145. Annual OGVs Emissions in TPY for year 2008 - Proposed 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)
2008	anchorage	0.05	0.04	0.04	0.46	0.42	0.03	0.04	0.00	26.49	0.00
	hotelling	1.18	0.94	0.39	5.86	19.34	0.22	0.51	0.00	1162.11	0.09
	transit	2.78	2.22	2.68	48.46	23.39	2.39	3.45	0.02	1413.80	0.08
Grand Total		**4.00**	**3.20**	**3.11**	**54.78**	**43.14**	**2.63**	**4.00**	**0.03**	**2602.41**	**0.17**

Table B1-146. Peak Daily OGVs Emissions in tons/day for year 2008 - Proposed 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)
2008	Fairway: AQMD Overwater Boundary to 20-Mile - Without \	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - Without VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Precautionary Area	0.00	0.00	0.00	0.04	0.00	0.00	0.02	0.00	0.95	0.00
	Manuevering	0.00	0.01	0.02	0.17	0.01	0.01	0.05	0.00	3.31	0.00
	Anchorage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Berthing	0.03	0.03	0.01	0.35	0.04	0.04	0.51	0.00	32.49	0.00
Grand Total		**0.04**	**0.04**	**0.03**	**0.57**	**0.05**	**0.04**	**0.58**	**0.00**	**36.75**	**0.00**

Table B1-147. Annual OGVs Emissions in TPY for year 2012 - Proposed 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)
2012	anchorage	0.03	0.03	0.03	1.05	0.17	0.05	0.11	0.00	76.45	0.00
	hotelling	0.82	0.76	0.74	25.71	4.87	1.17	2.81	0.02	2364.41	0.14
	transit	1.03	0.95	1.02	49.05	3.10	3.29	5.56	0.03	1569.77	0.08
Grand Total		**1.88**	**1.73**	**1.79**	**75.81**	**8.13**	**4.51**	**8.49**	**0.05**	**4010.63**	**0.23**

Table B1-148. Peak Daily OGVs Emissions in tons/day for year 2012 - Proposed 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)
2012	Fairway: AQMD Overwater Boundary to 20-Mile - Without \	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - Without VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: 20-Mile to Precautionary Area - With VSR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Precautionary Area	0.01	0.00	0.00	0.03	0.00	0.00	0.00	0.00	1.18	0.00
	Manuevering	0.02	0.00	0.01	0.12	0.00	0.00	0.01	0.00	3.33	0.00
	Anchorage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Berthing	0.04	0.01	0.02	0.35	0.01	0.01	0.07	0.00	30.87	0.00
Grand Total		**0.06**	**0.01**	**0.03**	**0.50**	**0.02**	**0.01**	**0.08**	**0.00**	**35.39**	**0.00**

Table B1-149. Annual OGVs Emissions in TPY for year 2014 - Proposed 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	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 B1-150. Peak Daily OGVs Emissions in tons/day for year 2014 - Proposed 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	0.05	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 B1-151. Annual OGVs Emissions in TPY for year 2018 - Proposed 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)
2018	anchorage	0.02	0.02	0.02	0.91	0.04	0.05	0.07	0.00	53.82	0.00
	hotelling	1.16	1.08	0.37	27.91	4.11	1.13	2.68	0.02	6201.10	0.47
	transit	3.15	2.90	3.03	282.24	5.74	14.83	20.83	0.15	8642.07	0.53
Grand Total		**4.32**	**4.00**	**3.41**	**311.07**	**9.89**	**16.01**	**23.58**	**0.17**	**14896.99**	**1.00**

Table B1-152. Peak Daily OGVs Emissions in tons/day for year 2018 - Proposed 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)
2018	Fairway: AQMD Overwater Boundary to 20-Mile - Without \	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Fairway: AQMD Overwater Boundary to 20-Mile - With VSR	0.01	0.00	0.03	0.45	0.00	0.00	0.01	0.00	9.22	0.00
	Fairway: 20-Mile to Precautionary Area - Without VSR	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	1.82	0.00
	Fairway: 20-Mile to Precautionary Area - With VSR	0.01	0.00	0.02	0.35	0.00	0.00	0.01	0.00	7.54	0.00
	Precautionary Area	0.01	0.00	0.02	0.37	0.00	0.00	0.01	0.00	9.04	0.00
	Manuevering	0.01	0.00	0.05	0.48	0.00	0.00	0.01	0.00	8.06	0.00
	Anchorage	0.03	0.01	0.03	0.44	0.01	0.01	0.01	0.00	21.41	0.00
	Berthing	0.03	0.01	0.01	0.30	0.01	0.01	0.03	0.00	39.78	0.00
Grand Total		**0.09**	**0.02**	**0.17**	**2.45**	**0.03**	**0.03**	**0.06**	**0.00**	**96.87**	**0.01**

Table B1-153. Annual OGVs Emissions in TPY for year 2023 - Proposed 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	2.12	0.34	0.86	21.98	0.82	0.76	2.69	0.02	4051.15	0.29
	transit	15.70	3.10	8.58	268.85	3.23	2.98	6.10	0.16	9183.37	0.56
Grand Total		**18.09**	**3.50**	**9.57**	**293.55**	**4.11**	**3.80**	**8.91**	**0.18**	**13424.38**	**0.87**

Table B1-154. Peak Daily OGVs Emissions in tons/day for year 2023 - Proposed 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	0.05	0.01	0.02	0.53	0.01	0.01	0.03	0.00	51.85	0.00
Grand Total		**0.21**	**0.04**	**0.10**	**3.18**	**0.05**	**0.04**	**0.10**	**0.00**	**146.58**	**0.01**

Table B1-155. Annual OGVs Emissions in TPY for year 2030 - Proposed 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	0.26	0.05	0.12	2.03	0.06	0.06	0.11	0.00	169.67	0.01
	hotelling	2.08	0.33	0.85	19.29	0.80	0.74	2.64	0.02	3974.46	0.29
	transit	33.80	4.88	16.59	214.87	5.00	4.62	6.29	0.16	9469.42	0.48
Grand Total		**36.14**	**5.27**	**17.57**	**236.19**	**5.87**	**5.42**	**9.04**	**0.18**	**13613.55**	**0.78**

Table B1-156. Peak Daily OGVs Emissions in tons/day for year 2030 - Proposed 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	0.10	0.01	0.04	0.62	0.01	0.01	0.02	0.00	28.00	0.00
	Fairway: 20-Mile to Precautionary Area	0.12	0.02	0.06	0.81	0.02	0.02	0.02	0.00	36.68	0.00
	Precautionary Area	0.06	0.01	0.03	0.36	0.01	0.01	0.01	0.00	15.45	0.00
	Manuevering	0.03	0.00	0.02	0.17	0.00	0.00	0.00	0.00	5.73	0.00
	Anchorage	0.03	0.00	0.01	0.20	0.01	0.01	0.01	0.00	14.06	0.00
	Berthing	0.06	0.01	0.02	0.49	0.02	0.01	0.04	0.00	53.29	0.00
Grand Total		**0.40**	**0.06**	**0.19**	**2.65**	**0.07**	**0.06**	**0.10**	**0.00**	**153.21**	**0.01**

Table B1-157. Annual OGVs Emissions in TPY for year 2036 - Proposed 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	2.08	0.33	0.85	14.76	0.80	0.74	2.64	0.02	3974.46	0.29
	transit	33.80	4.88	16.59	137.16	5.00	4.62	6.29	0.16	9469.42	0.48
Grand Total		**36.22**	**5.28**	**17.63**	**153.50**	**5.88**	**5.43**	**9.05**	**0.18**	**13626.87**	**0.78**

Table B1-158. Peak Daily OGVs Emissions in tons/day for year 2036 - Proposed 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**	0.10	0.01	0.04	0.39	0.01	0.01	0.02	0.00	28.00	0.00
	Fairway: 20-Mile to Precautionary Area	0.12	0.02	0.06	0.52	0.02	0.02	0.02	0.00	36.68	0.00
	Precautionary Area	0.06	0.01	0.03	0.23	0.01	0.01	0.01	0.00	15.45	0.00
	Manuevering	0.03	0.00	0.02	0.11	0.00	0.00	0.00	0.00	5.73	0.00
	Anchorage	0.03	0.00	0.01	0.14	0.01	0.01	0.01	0.00	14.06	0.00
	Berthing	0.06	0.01	0.02	0.32	0.02	0.01	0.04	0.00	53.29	0.00
Grand Total		**0.40**	**0.06**	**0.19**	**1.71**	**0.07**	**0.06**	**0.10**	**0.00**	**153.21**	**0.01**

Table B1- 159. Annual OGVs Emissions in TPY for year 2045 - Proposed 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	2.08	0.33	0.85	10.05	0.80	0.74	2.64	0.02	3974.46	0.29
	transit	33.80	4.88	16.59	56.70	5.00	4.62	6.29	0.16	9469.42	0.48
Grand Total		**36.22**	**5.28**	**17.63**	**67.48**	**5.88**	**5.43**	**9.05**	**0.18**	**13626.87**	**0.78**

Table B1-160. Peak Daily OGVs Emissions in tons/day for year 2045 - Proposed 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**	0.10	0.01	0.04	0.16	0.01	0.01	0.02	0.00	28.00	0.00
	Fairway: 20-Mile to Precautionary Area	0.12	0.02	0.06	0.21	0.02	0.02	0.02	0.00	36.68	0.00
	Precautionary Area	0.06	0.01	0.03	0.10	0.01	0.01	0.01	0.00	15.45	0.00
	Manuevering	0.03	0.00	0.02	0.05	0.00	0.00	0.00	0.00	5.73	0.00
	Anchorage	0.03	0.00	0.01	0.06	0.01	0.01	0.01	0.00	14.06	0.00
	Berthing	0.06	0.01	0.02	0.17	0.02	0.01	0.04	0.00	53.29	0.00
Grand Total		**0.40**	**0.06**	**0.19**	**0.74**	**0.07**	**0.06**	**0.10**	**0.00**	**153.21**	**0.01**

Rail
Locomotives and Switchers

Table B1-161. 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
2008	Line-Haul	0.379	1.280	7.252	0.005	0.256	0.256	0.235	494.0	0.040	0.013
2012	Line-Haul	0.297	1.280	6.014	0.005	0.201	0.201	0.186	494.0	0.040	0.013
2014	Line-Haul	0.250	1.280	5.692	0.005	0.168	0.168	0.157	494.0	0.040	0.013
2018	Line-Haul	0.219	1.280	5.767	0.005	0.144	0.144	0.133	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 B1-162. 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
2008	Switchers	0.449	1.779	6.825	0.006	0.175	0.175	0.157	662.0	0.050	0.017
2012	Switchers	0.241	1.803	4.404	0.006	0.037	0.037	0.034	669.5	0.050	0.017
2014	Switchers	0.241	1.779	4.403	0.006	0.037	0.037	0.034	669.4	0.050	0.017
2018	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 B1-163. Fuel Productivity Factor for Locomotives

Fuel Productivity Factor (gross ton-miles/gal)							
2008	2012	2014	2018	2023	2030	2036	2045
696.00	702.96	717.09	746.21	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 B1-164. Rail Fleet Characteristics & Mix

Train Description	% of Fleet Mix							
	2008	2012	2014	2018	2023	2030	2036	2045
Line-Haul								
pre-controlled	0.078	--	0.004	--	--	--	--	--
Tier 0	0.387	0.145	0.031	--	--	--	--	--
Tier 0+	0.057	0.187	0.133	0.408	0.243	0.097	0.022	--
Tier 1	0.068	0.029	0.032	--	--	--	--	--
Tier 1+	0.010	0.037	0.138	0.122	0.113	0.067	0.033	--
Tier 2	0.401	0.529	0.399	0.052	--	--	--	--
Tier 2+	--	--	0.133	0.157	0.198	0.153	0.091	0.016
Tier 3	--	0.074	0.131	0.180	0.170	0.153	0.125	0.053
Tier 4	0.000	0.000	0.000	0.080	0.276	0.531	0.729	0.931
Switchers								
PHL's pre-controlled switchers	--	--	--	--	--	--	--	--
pre-controlled	0.029	--	--	--	--	--	--	--
Tier 0	--	--	--	--	--	--	--	--
Tier 0+	--	--	--	--	--	--	--	--
Tier 1	--	--	--	--	--	--	--	--
Tier 1+	--	--	--	--	--	--	--	--
Tier 2	0.812	--	--	--	--	--	--	--
Tier 2+	--	--	--	--	--	--	--	--
Tier 3	--	0.915	0.914	0.914	0.914	0.914	0.914	0.914
Tier 4	--	--	--	--	--	--	--	--
Gensets	0.160	0.085	0.086	0.086	0.086	0.086	0.086	0.086

Table B1-165. 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.

Year **2008**

Table B1-166. On-site Rail Operations 2008 - All Scenarios

Parameters	2008	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.797	0.695
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	15

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 B1-167. China Shipping On-site Switching Activity 2008 - All Scenarios

Activity	2008
Annual Throughput WBCT	1,374,855
China Shipping Fraction of Throughput	0.30
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**399**

Table B1-168. Offsite Rail Operations 2008 - All Scenarios

Parameters	2008					
	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		0.6	0.7	20.2	0.6	5.8
East River Bank		0.1	0.1	0.8	0.1	
BNSF San Bernardino		3.7	5.0	41.9	3.7	
BNSF Cajon		1.4	1.9	15.0	1.4	
UP Los Angeles		1.2	1.6	10.2	1.2	
UP Alhambra		1.3	1.7	10.8	1.3	
UP Yuma		1.4	1.9	12.0	1.4	
UP Mojave		0.1	0.1	0.8	0.1	
Locomotives per Train	6	5	4	4	4	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		0.0	0.1		0.0	
BNSF Hobart & Commerce Yards		0.1	0.1		0.1	
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	4	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	0.6	0.1	na
UP Yuma		0.0	0.1	0.3	0.0	na
UP Mojave		0.0	0.0	0.0	0.0	na
Locomotives per Train	6	5	4	4	4	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	20,649
BNSF Hobart & Commerce Yards	27,244
UP East LA Yard	2,549
UP LATC Yard	512
UP COI Yard	3
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 B1-169. China Shipping Line -haul In Yard Activity 2008 - All Scenarios

Parameters	2008 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	6,614
China Shipping Related Off-dock Activity	
UP ICTF Yard	984
BNSF Hobart & Commerce Yards	1,298
UP East LA Yard	121
UP LATC Yard	24
UP COI Yard	0
BNSF SB Yard	-
BNSF SCIG Yard	-

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

Table B1-170. China Shipping Line-haul Traveling 2008 - All Scenarios

	2008
Fuel Productivity Factor (gross ton-miles/gal)	676

Note: Based on 696 gross ton-miles/gal in year 2011. Assume that the factor will increase by 1% each
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 B1-171. Line-haul Travel within SCAB 2008 - 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	204,844	6,307
East River Bank	9,436	291
BNSF San Bernardino	468,059	14,412
BNSF Cajon	170,071	5,237
UP Los Angeles	122,464	3,771
UP Alhambra	129,227	3,979
UP Yuma	142,896	4,400
UP Mojave	10,001	308

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

Table B1-172. Line-haul Travel from SCAB Border to CA Border 2008 - 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	1,309,821	40,330
UP Yuma	744,839	22,934
UP Mojave	65,721	2,024

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

Table B1-173. China Shipping Switchers In Yard Activity 2008 - All Scenarios

Activity/Yards	2008 Peak Day Work Done by Switchers (hp-hr/day)*
On-site (In terminal) Activity	399
China Shipping-Related Off-dock Activity	
UP ICTF Yard	61
BNSF Hobart & Commerce Yards	80
UP East LA Yard	8
UP LATC Yard	2
UP COI Yard	0
BNSF SB Yard	-
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2008

Table B1-174. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2008

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
2008	Line-Haul Travel	Alameda Corridor	6,307	5.271	17.799	100.845	0.069	3.558	3.558	3.262	6,869	0.556	0.181
2008	Line-Haul Travel	East River Bank	291	0.243	0.820	4.645	0.003	0.164	0.164	0.150	316	0.026	0.008
2008	Line-Haul Travel	BNSF San Bernardino	14,412	12.044	40.669	230.427	0.158	8.131	8.131	7.453	15,696	1.271	0.413
2008	Line-Haul Travel	BNSF Cajon	5,237	4.376	14.777	83.726	0.058	2.954	2.954	2.708	5,703	0.462	0.150
2008	Line-Haul Travel	UP Los Angeles	3,771	3.151	10.641	60.289	0.041	2.127	2.127	1.950	4,107	0.333	0.108
2008	Line-Haul Travel	UP Alhambra	3,979	3.325	11.228	63.619	0.044	2.245	2.245	2.058	4,333	0.351	0.114
2008	Line-Haul Travel	UP Yuma	4,400	3.677	12.416	70.348	0.048	2.482	2.482	2.275	4,792	0.388	0.126
2008	Line-Haul Travel	UP Mojave	308	0.257	0.869	4.924	0.003	0.174	0.174	0.159	335	0.027	0.009

Table B1-175. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2008

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
2008	Line-Haul Travel	BNSF Cajon	40,330	33.704	113.808	644.828	0.443	22.753	22.753	20.857	43,923	3.557	1.156
2008	Line-Haul Travel	UP Yuma	22,934	19.166	64.718	366.686	0.252	12.939	12.939	11.861	24,977	2.022	0.657
2008	Line-Haul Travel	UP Mojave	2,024	1.691	5.710	32.355	0.022	1.142	1.142	1.047	2,204	0.178	0.058

Table B1-176. Line-Haul Travel Peak Day Total Emissions (lbs/day) 2008

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
2008	Line-Haul Travel	Within SCAB boundaries	38,704	32	109	619	0	22	22	20	42,152	3	1
2008	Line-Haul Travel	Between SCAB Boundar	65,288	55	184	1,044	1	37	37	34	71,104	6	2

Peaking Factor:	234.190

Annual Emissions (tons/yr):

Table B1-177. Line-haul Travel Within SCAB Boundaries Annual Emissions 2008

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
2008	Line-Haul Travel	Alameda Corridor	1,477,097	0.617	2.084	11.808	0.008	0.417	0.417	0.382	804.341	0.065	0.021
2008	Line-Haul Travel	East River Bank	68,040	0.028	0.096	0.544	0.000	0.019	0.019	0.018	37.051	0.003	0.001
2008	Line-Haul Travel	BNSF San Bernardino	3,375,098	1.410	4.762	26.982	0.019	0.952	0.952	0.873	1,837.881	0.149	0.048
2008	Line-Haul Travel	BNSF Cajon	1,226,354	0.512	1.730	9.804	0.007	0.346	0.346	0.317	667.801	0.054	0.018
2008	Line-Haul Travel	UP Los Angeles	883,066	0.369	1.246	7.060	0.005	0.249	0.249	0.228	480.866	0.039	0.013
2008	Line-Haul Travel	UP Alhambra	931,831	0.389	1.315	7.449	0.005	0.263	0.263	0.241	507.421	0.041	0.013
2008	Line-Haul Travel	UP Yuma	1,030,398	0.431	1.454	8.237	0.006	0.291	0.291	0.266	561.094	0.045	0.015
2008	Line-Haul Travel	UP Mojave	72,116	0.030	0.102	0.577	0.000	0.020	0.020	0.019	39.270	0.003	0.001

Table B1-178. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2008

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
2008	Line-Haul Travel	BNSF Cajon	9,444,907	3.947	13.326	75.506	0.052	2.664	2.664	2.442	5,143.145	0.416	0.135
2008	Line-Haul Travel	UP Yuma	5,370,911	2.244	7.578	42.937	0.030	1.515	1.515	1.389	2,924.685	0.237	0.077
2008	Line-Haul Travel	UP Mojave	473,904	0.198	0.669	3.789	0.003	0.134	0.134	0.123	258.060	0.021	0.007

Table B1-179. Line-haul Travel Total Annual Emissions (tons/yr) 2008

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
2008	Line-Haul Travel	Within SCAB boundaries	9,064,000	3.787	12.789	72.461	0.050	2.557	2.557	2.344	4,935.725	0.400	0.130
2008	Line-Haul Travel	Between SCAB Boundar	15,289,722	6.389	21.573	122.232	0.084	4.313	4.313	3.954	8,325.890	0.674	0.219

One Hour Peak Emissions (lbs/hr):

Table B1-180. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2008

Emissions 2008			1-hr Peak Work (hp-	Peak Hourly Emissions (lbs/hr)									
Year	Type	Subdivision	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2008	Line-Haul Travel	Alameda Corridor	262.80	0.22	0.74	4.20	0.00	0.15	0.15	0.14	286.21	0.02	0.01
2008	Line-Haul Travel	East River Bank	12.11	0.01	0.03	0.19	0.00	0.01	0.01	0.01	13.18	0.00	0.00
2008	Line-Haul Travel	BNSF San Bernardino	600.49	0.50	1.69	9.60	0.01	0.34	0.34	0.31	653.99	0.05	0.02
2008	Line-Haul Travel	BNSF Cajon	218.19	0.18	0.62	3.49	0.00	0.12	0.12	0.11	237.63	0.02	0.01
2008	Line-Haul Travel	UP Los Angeles	157.11	0.13	0.44	2.51	0.00	0.09	0.09	0.08	171.11	0.01	0.00
2008	Line-Haul Travel	UP Alhambra	165.79	0.14	0.47	2.65	0.00	0.09	0.09	0.09	180.56	0.01	0.00
2008	Line-Haul Travel	UP Yuma	183.33	0.15	0.52	2.93	0.00	0.10	0.10	0.09	199.66	0.02	0.01
2008	Line-Haul Travel	UP Mojave	12.83	0.01	0.04	0.21	0.00	0.01	0.01	0.01	13.97	0.00	0.00

Table B1-181. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2008

			1-hr Peak Work (hp-	Peak Hourly Emissions (lbs/hr)									
Year	Type	Segment	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2008	Line-Haul Travel	BNSF Cajon	1,680.42	1.40	4.74	26.87	0.02	0.95	0.95	0.87	1,830.12	0.15	0.05
2008	Line-Haul Travel	UP Yuma	955.58	0.80	2.70	15.28	0.01	0.54	0.54	0.49	1,040.71	0.08	0.03
2008	Line-Haul Travel	UP Mojave	84.32	0.07	0.24	1.35	0.00	0.05	0.05	0.04	91.83	0.01	0.00

Table B1-182. Line-haul Travel Total Peak Hourly Emissions 2008

			1-hr Peak Work (hp-	Peak Hourly Emissions (lbs/hr)									
Year	Type	Region	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2008	Line-Haul Travel	Within SCAB boundaries	1,613	1.348	4.551	25.784	0.018	0.910	0.910	0.834	1,756.314	0.142	0.046
2008	Line-Haul Travel	Between SCAB Boundar	2,720	2.273	7.677	43.495	0.030	1.535	1.535	1.407	2,962.661	0.240	0.078

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

Table B1-183. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2008

Emissions 2008			8-hr Peak Hour Work (hp-	8-hr Peak Period Emissions (lbs/8hr period)									
Year	Type	Subdivision	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2008	Line-Haul Travel	Alameda Corridor	2,102.42	1.76	5.93	33.62	0.02	1.19	1.19	1.09	2,289.71	0.19	0.06
2008	Line-Haul Travel	East River Bank	96.84	0.08	0.27	1.55	0.00	0.05	0.05	0.05	105.47	0.01	0.00
2008	Line-Haul Travel	BNSF San Bernardino	4,803.94	4.01	13.56	76.81	0.05	2.71	2.71	2.48	5,231.89	0.42	0.14
2008	Line-Haul Travel	BNSF Cajon	1,745.53	1.46	4.93	27.91	0.02	0.98	0.98	0.90	1,901.03	0.15	0.05
2008	Line-Haul Travel	UP Los Angeles	1,256.91	1.05	3.55	20.10	0.01	0.71	0.71	0.65	1,368.88	0.11	0.04
2008	Line-Haul Travel	UP Alhambra	1,326.32	1.11	3.74	21.21	0.01	0.75	0.75	0.69	1,444.47	0.12	0.04
2008	Line-Haul Travel	UP Yuma	1,466.61	1.23	4.14	23.45	0.02	0.83	0.83	0.76	1,597.27	0.13	0.04
2008	Line-Haul Travel	UP Mojave	102.65	0.09	0.29	1.64	0.00	0.06	0.06	0.05	111.79	0.01	0.00

Table B1-184. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2008

			8-hr Peak Hour Work (hp-	8-hr Peak Period Emissions (lbs/8hr period)									
Year	Type	Segment	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2008	Line-Haul Travel	BNSF Cajon	13,443.40	11.23	37.94	214.94	0.15	7.58	7.58	6.95	14,640.98	1.19	0.39
2008	Line-Haul Travel	UP Yuma	7,644.68	6.39	21.57	122.23	0.08	4.31	4.31	3.95	8,325.69	0.67	0.22
2008	Line-Haul Travel	UP Mojave	674.53	0.56	1.90	10.78	0.01	0.38	0.38	0.35	734.62	0.06	0.02

Table B1-185. Line-haul Travel Total 8-hr Peak Period Emissions 2008

			8-hr Peak Hour Work (hp-	8-hr Peak Period Emissions (lbs/8hr period)									
Year	Type	Region	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2008	Line-Haul Travel	Within SCAB boundaries	12,901	10.781	36.406	206.274	0.142	7.278	7.278	6.672	14,050.515	1.138	0.370
2008	Line-Haul Travel	Between SCAB Boundar	21,763	18.187	61.412	347.956	0.239	12.278	12.278	11.255	23,701.288	1.919	0.624

Analysis Year:	2008

Table B1-186. Line-haul In-yard Peak Daily Emissions (lbs/day) 2008

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
2008	Line-Haul	WBCT (On-Site)	6,614	5.527	18.664	105.747	0.073	3.731	3.731	3.420	7,203.040	0.583	0.190
2008	Line-Haul	UP ICTF Yard	984	0.822	2.777	15.733	0.011	0.555	0.555	0.509	1,071.683	0.087	0.028
2008	Line-Haul	BNSF Hobart & Commerce Yards	1,298	1.085	3.664	20.758	0.014	0.732	0.732	0.671	1,413.977	0.114	0.037
2008	Line-Haul	UP East LA Yard	121	0.102	0.343	1.942	0.001	0.069	0.069	0.063	132.298	0.011	0.003
2008	Line-Haul	UP LATC Yard	24	0.020	0.069	0.390	0.000	0.014	0.014	0.013	26.579	0.002	0.001
2008	Line-Haul	UP COI Yard	0	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.152	0.000	0.000
2008	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
2008	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	**2,428**	2.03	6.85	38.83	0.03	1.37	1.37	1.26	2,644.69	0.21	0.07

Table B1-187. Line-haul In-yard Annual Emissions (tons/yr) 2008

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
2008	Line-Haul	WBCT (On-Site)	1,548,896	0.647	2.185	12.382	0.009	0.437	0.437	0.401	843.438	0.068	0.022
2008	Line-Haul	UP ICTF Yard	230,448	0.096	0.325	1.842	0.001	0.065	0.065	0.060	125.488	0.010	0.003
2008	Line-Haul	BNSF Hobart & Commerce Yards	304,053	0.127	0.429	2.431	0.002	0.086	0.086	0.079	165.569	0.013	0.004
2008	Line-Haul	UP East LA Yard	28,449	0.012	0.040	0.227	0.000	0.008	0.008	0.007	15.491	0.001	0.000
2008	Line-Haul	UP LATC Yard	5,715	0.002	0.008	0.046	0.000	0.002	0.002	0.001	3.112	0.000	0.000
2008	Line-Haul	UP COI Yard	33	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.018	0.000	0.000
2008	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
2008	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	**568,697**	0.24	0.80	4.55	0.00	0.16	0.16	0.15	309.68	0.03	0.01

Peaking Factor:	234.190

Table B1-188. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2008

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
2008	Line-Haul	WBCT (On-Site)	275.58	0.230	0.778	4.406	0.003	0.155	0.155	0.143	300.127	0.024	0.008
2008	Line-Haul	UP ICTF Yard	41.00	0.034	0.116	0.656	0.000	0.023	0.023	0.021	44.653	0.004	0.001
2008	Line-Haul	BNSF Hobart & Commerce Yards	54.10	0.045	0.153	0.865	0.001	0.031	0.031	0.028	58.916	0.005	0.002
2008	Line-Haul	UP East LA Yard	5.06	0.004	0.014	0.081	0.000	0.003	0.003	0.003	5.512	0.000	0.000
2008	Line-Haul	UP LATC Yard	1.02	0.001	0.003	0.016	0.000	0.001	0.001	0.001	1.107	0.000	0.000
2008	Line-Haul	UP COI Yard	0.01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.000
2008	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
2008	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	**101**	0.08	0.29	1.62	0.00	0.06	0.06	0.05	110.20	0.01	0.00

Table B1-189. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2008

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
2008	Line-Haul	WBCT (On-Site)	2,204.62	1.842	6.221	35.249	0.024	1.244	1.244	1.140	2,401.013	0.194	0.063
2008	Line-Haul	UP ICTF Yard	328.01	0.274	0.926	5.244	0.004	0.185	0.185	0.170	357.228	0.029	0.009
2008	Line-Haul	BNSF Hobart & Commerce Yards	432.77	0.362	1.221	6.919	0.005	0.244	0.244	0.224	471.326	0.038	0.012
2008	Line-Haul	UP East LA Yard	40.49	0.034	0.114	0.647	0.000	0.023	0.023	0.021	44.099	0.004	0.001
2008	Line-Haul	UP LATC Yard	8.14	0.007	0.023	0.130	0.000	0.005	0.005	0.004	8.860	0.001	0.000
2008	Line-Haul	UP COI Yard	0.05	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.051	0.000	0.000
2008	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
2008	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	**809**	0.68	2.28	12.94	0.01	0.46	0.46	0.42	881.56	0.07	0.02

Analysis Year:	2008

Table B1-190. Switchers In-yard Peak Daily Emissions (lbs/day) 2008

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
2008	Switchers	WBCT (On-Site)	399	0.395	1.564	5.999	0.005	0.154	0.154	0.138	581.874	0.044	0.015
2008	Switchers	UP ICTF Yard	61	0.060	0.239	0.917	0.001	0.023	0.023	0.021	88.970	0.007	0.002
2008	Switchers	BNSF Hobart & Commerce Yards	80	0.080	0.315	1.210	0.001	0.031	0.031	0.028	117.387	0.009	0.003
2008	Switchers	UP East LA Yard	8	0.007	0.030	0.113	0.000	0.003	0.003	0.003	10.983	0.001	0.000
2008	Switchers	UP LATC Yard	2	0.001	0.006	0.023	0.000	0.001	0.001	0.001	2.207	0.000	0.000
2008	Switchers	UP COI Yard	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.000
2008	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2008	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	**150**	0.15	0.59	2.26	0.00	0.06	0.06	0.05	219.56	0.02	0.01

Table B1-191. Switchers In-yard Annual Emissions (tons/yr) 2008

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
2008	Switchers	WBCT (On-Site)	93,365	0.046	0.183	0.702	0.001	0.018	0.018	0.016	68.134	0.005	0.002
2008	Switchers	UP ICTF Yard	14,276	0.007	0.028	0.107	0.000	0.003	0.003	0.002	10.418	0.001	0.000
2008	Switchers	BNSF Hobart & Commerce Yards	18,835	0.009	0.037	0.142	0.000	0.004	0.004	0.003	13.745	0.001	0.000
2008	Switchers	UP East LA Yard	1,762	0.001	0.003	0.013	0.000	0.000	0.000	0.000	1.286	0.000	0.000
2008	Switchers	UP LATC Yard	354	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.258	0.000	0.000
2008	Switchers	UP COI Yard	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
2008	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2008	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	**35,229**	0.02	0.07	0.27	0.00	0.01	0.01	0.01	25.71	0.00	0.00

Peaking Factor:	234.190

Table B1-192. Switchers In-yard Peak Hour Emissions (lbs/hr) 2008

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
2008	Switchers	WBCT (On-Site)	16.61	0.016	0.065	0.250	0.000	0.006	0.006	0.006	24.245	0.002	0.001
2008	Switchers	UP ICTF Yard	2.54	0.003	0.010	0.038	0.000	0.001	0.001	0.001	3.707	0.000	0.000
2008	Switchers	BNSF Hobart & Commerce Yards	3.35	0.003	0.013	0.050	0.000	0.001	0.001	0.001	4.891	0.000	0.000
2008	Switchers	UP East LA Yard	0.31	0.000	0.001	0.005	0.000	0.000	0.000	0.000	0.458	0.000	0.000
2008	Switchers	UP LATC Yard	0.06	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.092	0.000	0.000
2008	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
2008	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2008	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	**6**	0.01	0.02	0.09	0.00	0.00	0.00	0.00	9.15	0.00	0.00

Table B1-193. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2008

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
2008	Switchers	WBCT (On-Site)	132.89	0.132	0.521	2.000	0.002	0.051	0.051	0.046	193.958	0.015	0.005
2008	Switchers	UP ICTF Yard	20.32	0.020	0.080	0.306	0.000	0.008	0.008	0.007	29.657	0.002	0.001
2008	Switchers	BNSF Hobart & Commerce Yards	26.81	0.027	0.105	0.403	0.000	0.010	0.010	0.009	39.129	0.003	0.001
2008	Switchers	UP East LA Yard	2.51	0.002	0.010	0.038	0.000	0.001	0.001	0.001	3.661	0.000	0.000
2008	Switchers	UP LATC Yard	0.50	0.000	0.002	0.008	0.000	0.000	0.000	0.000	0.736	0.000	0.000
2008	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000
2008	Switchers	BNSF SB Yard	-	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2008	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	**50**	0.05	0.20	0.75	0.00	0.02	0.02	0.02	73.19	0.01	0.00

Year	2012

Table B1-194. On-site Rail Operations 2012 - All Scenarios

Parameters	2012	
	Unit Trains	Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.808	0.745
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	15

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 B1-195. China Shipping On-site Switching Activity 2012 - All Scenarios

Activity	2012
Annual Throughput WBCT	1,374,855
China Shipping Fraction of Throughput	0.51
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**676**

Table B1-196. Offsite Rail Operations 2012 - All Scenarios

Parameters	2012					
	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		0.7	0.9	20.6	0.7	6.3
East River Bank		0.1	0.1	0.8	0.1	
BNSF San Bernardino		3.8	5.0	43.9	3.8	
BNSF Cajon		1.4	1.9	15.8	1.4	
UP Los Angeles		1.4	1.8	10.0	1.4	
UP Alhambra		1.5	2.0	10.6	1.5	
UP Yuma		1.6	2.1	11.8	1.6	
UP Mojave		0.1	0.1	0.8	0.1	
Locomotives per Train	6	5	4	4	4	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		0.0	0.1		0.0	
BNSF Hobart & Commerce Yards		0.1	0.1		0.1	
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		0.0	0.0		0.0	
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	4	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	0.6	0.1	na
UP Yuma		0.0	0.1	0.3	0.0	na
UP Mojave		0.0	0.0	0.0	0.0	na
Locomotives per Train	6	5	4	4	4	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	27,181
BNSF Hobart & Commerce Yards	29,264
UP East LA Yard	1,491
UP LATC Yard	621
UP COI Yard	1
BNSF SB Yard	43
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 B1-197. China Shipping Line -haul In Yard Activity 2012 - All Scenarios

Parameters	2012 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	6,769
China Shipping Related Off-dock Activity	
UP ICTF Yard	1,211
BNSF Hobart & Commerce Yards	1,304
UP East LA Yard	66
UP LATC Yard	28
UP COI Yard	0
BNSF SB Yard	2
BNSF SCIG Yard	-

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

Table B1-198. China Shipping Line-haul Traveling 2012 - All Scenarios

	2012
Fuel Productivity Factor (gross ton-miles/gal)	703

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 B1-199. Line-haul Travel within SCAB 2012 - 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	212,724	6,294
East River Bank	9,819	291
BNSF San Bernardino	487,594	14,427
BNSF Cajon	177,128	5,241
UP Los Angeles	124,946	3,697
UP Alhambra	132,803	3,930
UP Yuma	146,802	4,344
UP Mojave	10,274	304

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

Table B1-200. Line-haul Travel from SCAB Border to CA Border 2012 - 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	1,364,167	40,365
UP Yuma	765,200	22,642
UP Mojave	67,518	1,998

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

Table B1-201. China Shipping Switchers In Yard Activity 2012 - All Scenarios

Activity/Yards	2012 Peak Day Work Done by Switchers (hp-hr/day)*
On-site (In terminal) Activity	676
China Shipping-Related Off-dock Activity	
UP ICTF Yard	96
BNSF Hobart & Commerce Yards	104
UP East LA Yard	5
UP LATC Yard	2
UP COI Yard	0
BNSF SB Yard	0
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2012

Table B1-202. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2012

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
2012	Line-Haul Travel	Alameda Corridor	6,294	4.121	17.762	83.459	0.069	2.795	2.795	2.587	6,855	0.555	0.180
2012	Line-Haul Travel	East River Bank	291	0.190	0.820	3.852	0.003	0.129	0.129	0.119	316	0.026	0.008
2012	Line-Haul Travel	BNSF San Bernardino	14,427	9.445	40.713	191.299	0.159	6.407	6.407	5.931	15,713	1.272	0.413
2012	Line-Haul Travel	BNSF Cajon	5,241	3.431	14.790	69.493	0.058	2.328	2.328	2.155	5,708	0.462	0.150
2012	Line-Haul Travel	UP Los Angeles	3,697	2.420	10.433	49.020	0.041	1.642	1.642	1.520	4,026	0.326	0.106
2012	Line-Haul Travel	UP Alhambra	3,930	2.572	11.089	52.103	0.043	1.745	1.745	1.615	4,280	0.347	0.113
2012	Line-Haul Travel	UP Yuma	4,344	2.844	12.258	57.595	0.048	1.929	1.929	1.786	4,731	0.383	0.124
2012	Line-Haul Travel	UP Mojave	304	0.199	0.858	4.031	0.003	0.135	0.135	0.125	331	0.027	0.009

Table B1-203. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2012

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
2012	Line-Haul Travel	BNSF Cajon	40,365	26.425	113.905	535.208	0.444	17.926	17.926	16.593	43,960	3.560	1.157
2012	Line-Haul Travel	UP Yuma	22,642	14.823	63.893	300.213	0.249	10.055	10.055	9.308	24,659	1.997	0.649
2012	Line-Haul Travel	UP Mojave	1,998	1.308	5.638	26.489	0.022	0.887	0.887	0.821	2,176	0.176	0.057

Table B1-204. Line-Haul Travel Peak Day Total Emissions (lbs/day) 2012

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
2012	Line-Haul Travel	Within SCAB boundaries	38,528	25	109	511	0	17	17	16	41,960	3	1
2012	Line-Haul Travel	Between SCAB Boundar	65,004	43	183	862	1	29	29	27	70,795	6	2

Peaking Factor:	250.416

Annual Emissions (tons/yr):

Table B1-205. Line-haul Travel Within SCAB Boundaries Annual Emissions 2012

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
2012	Line-Haul Travel	Alameda Corridor	1,576,204	0.516	2.224	10.450	0.009	0.350	0.350	0.324	858.308	0.069	0.023
2012	Line-Haul Travel	East River Bank	72,754	0.024	0.103	0.482	0.000	0.016	0.016	0.015	39.617	0.003	0.001
2012	Line-Haul Travel	BNSF San Bernardino	3,612,880	1.183	5.098	23.952	0.020	0.802	0.802	0.743	1,967.363	0.159	0.052
2012	Line-Haul Travel	BNSF Cajon	1,312,446	0.430	1.852	8.701	0.007	0.291	0.291	0.270	714.681	0.058	0.019
2012	Line-Haul Travel	UP Los Angeles	925,798	0.303	1.306	6.138	0.005	0.206	0.206	0.190	504.136	0.041	0.013
2012	Line-Haul Travel	UP Alhambra	984,015	0.322	1.388	6.524	0.005	0.218	0.218	0.202	535.837	0.043	0.014
2012	Line-Haul Travel	UP Yuma	1,087,745	0.356	1.535	7.211	0.006	0.242	0.242	0.224	592.323	0.048	0.016
2012	Line-Haul Travel	UP Mojave	76,129	0.025	0.107	0.505	0.000	0.017	0.017	0.016	41.456	0.003	0.001

Table B1-206. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2012

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
2012	Line-Haul Travel	BNSF Cajon	10,107,950	3.309	14.262	67.012	0.056	2.244	2.244	2.078	5,504.200	0.446	0.145
2012	Line-Haul Travel	UP Yuma	5,669,834	1.856	8.000	37.589	0.031	1.259	1.259	1.165	3,087.460	0.250	0.081
2012	Line-Haul Travel	UP Mojave	500,279	0.164	0.706	3.317	0.003	0.111	0.111	0.103	272.423	0.022	0.007

Table B1-207. Line-haul Travel Total Annual Emissions (tons/yr) 2012

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
2012	Line-Haul Travel	Within SCAB boundaries	9,647,971	3.158	13.613	63.963	0.053	2.142	2.142	1.983	5,253.722	0.425	0.138
2012	Line-Haul Travel	Between SCAB Boundar	16,278,063	5.328	22.968	107.918	0.089	3.615	3.615	3.346	8,864.083	0.718	0.233

One Hour Peak Emissions (lbs/hr):

Table B1-208. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2012

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
2012	Line-Haul Travel	Alameda Corridor	262.26	0.17	0.74	3.48	0.00	0.12	0.12	0.11	285.63	0.02	0.01
2012	Line-Haul Travel	East River Bank	12.11	0.01	0.03	0.16	0.00	0.01	0.01	0.00	13.18	0.00	0.00
2012	Line-Haul Travel	BNSF San Bernardino	601.15	0.39	1.70	7.97	0.01	0.27	0.27	0.25	654.70	0.05	0.02
2012	Line-Haul Travel	BNSF Cajon	218.38	0.14	0.62	2.90	0.00	0.10	0.10	0.09	237.83	0.02	0.01
2012	Line-Haul Travel	UP Los Angeles	154.04	0.10	0.43	2.04	0.00	0.07	0.07	0.06	167.77	0.01	0.00
2012	Line-Haul Travel	UP Alhambra	163.73	0.11	0.46	2.17	0.00	0.07	0.07	0.07	178.32	0.01	0.00
2012	Line-Haul Travel	UP Yuma	180.99	0.12	0.51	2.40	0.00	0.08	0.08	0.07	197.11	0.02	0.01
2012	Line-Haul Travel	UP Mojave	12.67	0.01	0.04	0.17	0.00	0.01	0.01	0.01	13.80	0.00	0.00

Table B1-209. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2012

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
2012	Line-Haul Travel	BNSF Cajon	1,681.86	1.10	4.75	22.30	0.02	0.75	0.75	0.69	1,831.68	0.15	0.05
2012	Line-Haul Travel	UP Yuma	943.40	0.62	2.66	12.51	0.01	0.42	0.42	0.39	1,027.44	0.08	0.03
2012	Line-Haul Travel	UP Mojave	83.24	0.05	0.23	1.10	0.00	0.04	0.04	0.03	90.66	0.01	0.00

Table B1-210. Line-haul Travel Total Peak Hourly Emissions 2012

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
2012	Line-Haul Travel	Within SCAB boundaries	1,605	1.051	4.530	21.286	0.018	0.713	0.713	0.660	1,748.329	0.142	0.046
2012	Line-Haul Travel	Between SCAB Boundar	2,708	1.773	7.643	35.913	0.030	1.203	1.203	1.113	2,949.782	0.239	0.078

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

Table B1-211. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period

Emissions 2012			8-hr Peak Hour Work (hp-	8-hr Peak Period Emissions (lbs/8hr period)									
Year	Type	Subdivision	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2012	Line-Haul Travel	Alameda Corridor	2,098.11	1.37	5.92	27.82	0.02	0.93	0.93	0.86	2,285.02	0.19	0.06
2012	Line-Haul Travel	East River Bank	96.84	0.06	0.27	1.28	0.00	0.04	0.04	0.04	105.47	0.01	0.00
2012	Line-Haul Travel	BNSF San Bernardino	4,809.16	3.15	13.57	63.77	0.05	2.14	2.14	1.98	5,237.58	0.42	0.14
2012	Line-Haul Travel	BNSF Cajon	1,747.02	1.14	4.93	23.16	0.02	0.78	0.78	0.72	1,902.65	0.15	0.05
2012	Line-Haul Travel	UP Los Angeles	1,232.34	0.81	3.48	16.34	0.01	0.55	0.55	0.51	1,342.13	0.11	0.04
2012	Line-Haul Travel	UP Alhambra	1,309.84	0.86	3.70	17.37	0.01	0.58	0.58	0.54	1,426.52	0.12	0.04
2012	Line-Haul Travel	UP Yuma	1,447.92	0.95	4.09	19.20	0.02	0.64	0.64	0.60	1,576.90	0.13	0.04
2012	Line-Haul Travel	UP Mojave	101.34	0.07	0.29	1.34	0.00	0.05	0.05	0.04	110.36	0.01	0.00

Table B1-212. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2012

			8-hr Peak Hour Work (hp-	8-hr Peak Period Emissions (lbs/8hr period)									
Year	Type	Segment	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2012	Line-Haul Travel	BNSF Cajon	13,454.86	8.81	37.97	178.40	0.15	5.98	5.98	5.53	14,653.46	1.19	0.39
2012	Line-Haul Travel	UP Yuma	7,547.21	4.94	21.30	100.07	0.08	3.35	3.35	3.10	8,219.54	0.67	0.22
2012	Line-Haul Travel	UP Mojave	665.93	0.44	1.88	8.83	0.01	0.30	0.30	0.27	725.25	0.06	0.02

Table B1-213. Line-haul Travel Total 8-hr Peak Period Emissions 2012

			8-hr Peak Hour Work (hp-	8-hr Peak Period Emissions (lbs/8hr period)									
Year	Type	Region	hr/day)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2012	Line-Haul Travel	Within SCAB boundaries	12,843	8.408	36.241	170.284	0.141	5.703	5.703	5.279	13,986.631	1.133	0.368
2012	Line-Haul Travel	Between SCAB Boundar	21,668	14.185	61.145	287.304	0.238	9.623	9.623	8.907	23,598.254	1.911	0.621

Analysis Year:	2012

Table B1-214. Line-haul In-yard Peak Daily Emissions (lbs/day) 2012

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
2012	Line-Haul	WBCT (On-Site)	6,769	4.432	19.102	89.756	0.074	3.006	3.006	2.783	7,372.279	0.597	0.194
2012	Line-Haul	UP ICTF Yard	1,211	0.793	3.418	16.062	0.013	0.538	0.538	0.498	1,319.304	0.107	0.035
2012	Line-Haul	BNSF Hobart & Commerce Yards	1,304	0.854	3.680	17.293	0.014	0.579	0.579	0.536	1,420.383	0.115	0.037
2012	Line-Haul	UP East LA Yard	66	0.044	0.188	0.881	0.001	0.030	0.030	0.027	72.377	0.006	0.002
2012	Line-Haul	UP LATC Yard	28	0.018	0.078	0.367	0.000	0.012	0.012	0.011	30.142	0.002	0.001
2012	Line-Haul	UP COI Yard	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.000	0.000
2012	Line-Haul	BNSF SB Yard	2	0.001	0.005	0.025	0.000	0.001	0.001	0.001	2.067	0.000	0.000
2012	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	**2,612**	1.71	7.37	34.63	0.03	1.16	1.16	1.07	2,844.30	0.23	0.07

Table B1-215. Line-haul In-yard Annual Emissions (tons/yr) 2012

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
2012	Line-Haul	WBCT (On-Site)	1,695,131	0.555	2.392	11.238	0.009	0.376	0.376	0.348	923.070	0.075	0.024
2012	Line-Haul	UP ICTF Yard	303,352	0.099	0.428	2.011	0.002	0.067	0.067	0.062	165.188	0.013	0.004
2012	Line-Haul	BNSF Hobart & Commerce Yards	326,593	0.107	0.461	2.165	0.002	0.073	0.073	0.067	177.844	0.014	0.005
2012	Line-Haul	UP East LA Yard	16,642	0.005	0.023	0.110	0.000	0.004	0.004	0.003	9.062	0.001	0.000
2012	Line-Haul	UP LATC Yard	6,931	0.002	0.010	0.046	0.000	0.002	0.002	0.001	3.774	0.000	0.000
2012	Line-Haul	UP COI Yard	7	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.004	0.000	0.000
2012	Line-Haul	BNSF SB Yard	475	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.259	0.000	0.000
2012	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	**653,999**	0.21	0.92	4.34	0.00	0.15	0.15	0.13	356.13	0.03	0.01

Peaking Factor:	250.416

Table B1-216. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2012

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
2012	Line-Haul	WBCT (On-Site)	282.05	0.185	0.796	3.740	0.003	0.125	0.125	0.116	307.178	0.025	0.008
2012	Line-Haul	UP ICTF Yard	50.47	0.033	0.142	0.669	0.001	0.022	0.022	0.021	54.971	0.004	0.001
2012	Line-Haul	BNSF Hobart & Commerce Yards	54.34	0.036	0.153	0.721	0.001	0.024	0.024	0.022	59.183	0.005	0.002
2012	Line-Haul	UP East LA Yard	2.77	0.002	0.008	0.037	0.000	0.001	0.001	0.001	3.016	0.000	0.000
2012	Line-Haul	UP LATC Yard	1.15	0.001	0.003	0.015	0.000	0.001	0.001	0.000	1.256	0.000	0.000
2012	Line-Haul	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
2012	Line-Haul	BNSF SB Yard	0.08	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.086	0.000	0.000
2012	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	**109**	0.07	0.31	1.44	0.00	0.05	0.05	0.04	118.51	0.01	0.00

Table B1-217. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2012

Year	Type	Rail Yard	Peak 8hr Period	8-hr Peak Line Haul In-Yard Emissions (lbs/8-hr period)									
			hp-hrs	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2012	Line-Haul	WBCT (On-Site)	2,256.42	1.477	6.367	29.919	0.025	1.002	1.002	0.928	2,457.426	0.199	0.065
2012	Line-Haul	UP ICTF Yard	403.80	0.264	1.139	5.354	0.004	0.179	0.179	0.166	439.768	0.036	0.012
2012	Line-Haul	BNSF Hobart & Commerce Yards	434.73	0.285	1.227	5.764	0.005	0.193	0.193	0.179	473.461	0.038	0.012
2012	Line-Haul	UP East LA Yard	22.15	0.015	0.063	0.294	0.000	0.010	0.010	0.009	24.126	0.002	0.001
2012	Line-Haul	UP LATC Yard	9.23	0.006	0.026	0.122	0.000	0.004	0.004	0.004	10.047	0.001	0.000
2012	Line-Haul	UP COI Yard	0.01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000
2012	Line-Haul	BNSF SB Yard	0.63	0.000	0.002	0.008	0.000	0.000	0.000	0.000	0.689	0.000	0.000
2012	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	**871**	0.57	2.46	11.54	0.01	0.39	0.39	0.36	948.10	0.08	0.02

Analysis Year:	2012

Table B1-218. Switchers In-yard Peak Daily Emissions (lbs/day) 2012

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
2012	Switchers	WBCT (On-Site)	676	0.360	2.688	6.567	0.009	0.055	0.055	0.051	998.324	0.075	0.025
2012	Switchers	UP ICTF Yard	96	0.051	0.383	0.936	0.001	0.008	0.008	0.007	142.278	0.011	0.004
2012	Switchers	BNSF Hobart & Commerce Yards	104	0.055	0.412	1.008	0.001	0.009	0.009	0.008	153.179	0.011	0.004
2012	Switchers	UP East LA Yard	5	0.003	0.021	0.051	0.000	0.000	0.000	0.000	7.805	0.001	0.000
2012	Switchers	UP LATC Yard	2	0.001	0.009	0.021	0.000	0.000	0.000	0.000	3.251	0.000	0.000
2012	Switchers	UP COI Yard	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
2012	Switchers	BNSF SB Yard	0	0.000	0.001	0.001	0.000	0.000	0.000	0.000	0.223	0.000	0.000
2012	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	**208**	0.11	0.83	2.02	0.00	0.02	0.02	0.02	306.74	0.02	0.01

Table B1-219. Switchers In-yard Annual Emissions (tons/yr) 2012

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
2012	Switchers	WBCT (On-Site)	169,368	0.045	0.337	0.822	0.001	0.007	0.007	0.006	124.998	0.009	0.003
2012	Switchers	UP ICTF Yard	24,138	0.006	0.048	0.117	0.000	0.001	0.001	0.001	17.814	0.001	0.000
2012	Switchers	BNSF Hobart & Commerce Yards	25,987	0.007	0.052	0.126	0.000	0.001	0.001	0.001	19.179	0.001	0.000
2012	Switchers	UP East LA Yard	1,324	0.000	0.003	0.006	0.000	0.000	0.000	0.000	0.977	0.000	0.000
2012	Switchers	UP LATC Yard	551	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.407	0.000	0.000
2012	Switchers	UP COI Yard	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2012	Switchers	BNSF SB Yard	38	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.028	0.000	0.000
2012	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	**52,039**	0.01	0.10	0.25	0.00	0.00	0.00	0.00	38.41	0.00	0.00

Peaking Factor:	250.416

Table B1-220. Switchers In-yard Peak Hour Emissions (lbs/hr) 2012

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
2012	Switchers	WBCT (On-Site)	28.18	0.015	0.112	0.274	0.000	0.002	0.002	0.002	41.597	0.003	0.001
2012	Switchers	UP ICTF Yard	4.02	0.002	0.016	0.039	0.000	0.000	0.000	0.000	5.928	0.000	0.000
2012	Switchers	BNSF Hobart & Commerce Yards	4.32	0.002	0.017	0.042	0.000	0.000	0.000	0.000	6.382	0.000	0.000
2012	Switchers	UP East LA Yard	0.22	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.325	0.000	0.000
2012	Switchers	UP LATC Yard	0.09	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.135	0.000	0.000
2012	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2012	Switchers	BNSF SB Yard	0.01	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.000
2012	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	**9**	0.00	0.03	0.08	0.00	0.00	0.00	0.00	12.78	0.00	0.00

Table B1-221. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2012

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
2012	Switchers	WBCT (On-Site)	225.45	0.120	0.896	2.189	0.003	0.018	0.018	0.017	332.775	0.025	0.008
2012	Switchers	UP ICTF Yard	32.13	0.017	0.128	0.312	0.000	0.003	0.003	0.002	47.426	0.004	0.001
2012	Switchers	BNSF Hobart & Commerce Yards	34.59	0.018	0.137	0.336	0.000	0.003	0.003	0.003	51.060	0.004	0.001
2012	Switchers	UP East LA Yard	1.76	0.001	0.007	0.017	0.000	0.000	0.000	0.000	2.602	0.000	0.000
2012	Switchers	UP LATC Yard	0.73	0.000	0.003	0.007	0.000	0.000	0.000	0.000	1.084	0.000	0.000
2012	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
2012	Switchers	BNSF SB Yard	0.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.074	0.000	0.000
2012	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	**69**	0.04	0.28	0.67	0.00	0.01	0.01	0.01	102.25	0.01	0.00

Year 2014

Table B1-222. 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 B1-213. 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 B1-224. 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 B1-225. 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 B1-226. 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 B1-227. 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 B1-228. 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 B1-229. 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 B1-230. 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

Analysis Year:	2014

Table B1-231. 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 B1-232. 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 B1-233. 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 B1-234. 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 B1-235. 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 B1-236. 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 B1-237. 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 B1-238. 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 B1-239. 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 B1-240. 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 B1-241. 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 B1-242. 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 B1-243. 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 B1-244. 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 B1-245. 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 B1-246. 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 B1-247. 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 B1-248. 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 B1-249. 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 B1-250. 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 **2018**

Table B1-251. On-site Rail Operations 2018 - All Scenarios

Parameters	2018 Unit Trains	2018 Partial Trains
Train length (ft)	8,813	2,000
On-site Line-Haul Activity		
Average # of train visits per day (peak month)	0.824	0.760
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	15

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 B1-252. China Shipping On-site Switching Activity 2018 - All Scenarios

Activity	2018
Annual Throughput WBCT	1,374,855
China Shipping Fraction of Throughput	0.82
WBCT Switchers work hours (hp-hrs/day)	1,329
CS Switchers work hours (hp-hrs/day)	**1,094**

Table B1-253. Offsite Rail Operations 2018 - All Scenarios

Parameters	2018 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		1.6	2.1	21.1	1.6	6.4
East River Bank		0.2	0.3	0.8	0.2	
BNSF San Bernardino		8.6	11.5	44.8	8.6	
BNSF Cajon		3.3	4.3	16.1	3.3	
UP Los Angeles		3.2	4.2	10.2	3.2	
UP Alhambra		3.3	4.5	10.9	3.3	
UP Yuma		3.7	4.9	12.0	3.7	
UP Mojave		0.3	0.3	0.8	0.3	
Locomotives per Train	6	5	4	4	4	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	0.2		0.1	
BNSF Hobart & Commerce Yards		0.1	0.2		0.1	
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		0.0	0.0		0.0	
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	4	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	0.2	0.6	0.1	na
UP Yuma		0.1	0.1	0.3	0.1	na
UP Mojave		0.0	0.0	0.0	0.0	na
Locomotives per Train	6	5	4	4	4	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	56,876
BNSF Hobart & Commerce Yards	61,233
UP East LA Yard	3,120
UP LATC Yard	1,299
UP COI Yard	1
BNSF SB Yard	89
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 B1-254. China Shipping Line -haul In Yard Activity 2018 - All Scenarios

Parameters	2018 Peak Day Work Done by Locomotives (hp-hr/day) *
On-site (In terminal) Activity	6,908
China Shipping Related Off-dock Activity	
UP ICTF Yard	2,765
BNSF Hobart & Commerce Yards	2,977
UP East LA Yard	152
UP LATC Yard	63
UP COI Yard	0
BNSF SB Yard	4
BNSF SCIG Yard	-

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

Table B1-255. China Shipping Line-haul Traveling 2018 - All Scenarios

	2018
Fuel Productivity Factor (gross ton-miles/gal)	746

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 B1-256. Line-haul Travel within SCAB 2018 - 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	240,233	6,696
East River Bank	13,445	375
BNSF San Bernardino	624,863	17,418
BNSF Cajon	228,782	6,377
UP Los Angeles	173,981	4,850
UP Alhambra	184,807	5,151
UP Yuma	203,836	5,682
UP Mojave	14,266	398

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

Table B1-257. Line-haul Travel from SCAB Border to CA Border 2018 - 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	1,761,993	49,114
UP Yuma	1,062,489	29,616
UP Mojave	93,749	2,613

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

Table B1-258. China Shipping Switchers In Yard Activity 2018 - All Scenarios

Activity/Yards	2018 Peak Day Work Done by Switchers (hp-hr/day)*
On-site (In terminal) Activity	1,094
China Shipping-Related Off-dock Activity	
UP ICTF Yard	299
BNSF Hobart & Commerce Yards	322
UP East LA Yard	16
UP LATC Yard	7
UP COI Yard	0
BNSF SB Yard	0
BNSF SCIG Yard	-

*Work from all switcher locomotives operating on peak day

Analysis Year:	2018

Table B1-259. Line-haul Travel Within SCAB Boundaries Peak Day Emissions 2018

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
2018	Line-Haul Travel	Alameda Corridor	6,696	3.226	18.896	85.133	0.074	2.121	2.121	1.957	7,293	0.591	0.192
2018	Line-Haul Travel	East River Bank	375	0.181	1.058	4.765	0.004	0.119	0.119	0.110	408	0.033	0.011
2018	Line-Haul Travel	BNSF San Bernardino	17,418	8.391	49.151	221.436	0.192	5.517	5.517	5.089	18,969	1.536	0.499
2018	Line-Haul Travel	BNSF Cajon	6,377	3.072	17.996	81.075	0.070	2.020	2.020	1.863	6,945	0.562	0.183
2018	Line-Haul Travel	UP Los Angeles	4,850	2.336	13.685	61.655	0.053	1.536	1.536	1.417	5,282	0.428	0.139
2018	Line-Haul Travel	UP Alhambra	5,151	2.482	14.537	65.491	0.057	1.632	1.632	1.505	5,610	0.454	0.148
2018	Line-Haul Travel	UP Yuma	5,682	2.737	16.034	72.235	0.063	1.800	1.800	1.660	6,188	0.501	0.163
2018	Line-Haul Travel	UP Mojave	398	0.192	1.122	5.056	0.004	0.126	0.126	0.116	433	0.035	0.011

Table B1-260. Line-haul Travel Between SCAB Boundaries and CA Border Peak Day Emissions 2018

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
2018	Line-Haul Travel	BNSF Cajon	49,114	23.662	138.597	624.406	0.540	15.556	15.556	14.351	53,490	4.331	1.408
2018	Line-Haul Travel	UP Yuma	29,616	14.268	83.574	376.520	0.326	9.380	9.380	8.654	32,254	2.612	0.849
2018	Line-Haul Travel	UP Mojave	2,613	1.259	7.374	33.222	0.029	0.828	0.828	0.764	2,846	0.230	0.075

Table B1-261. Line-Haul Travel Peak Day Total Emissions (lbs/day) 2018

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
2018	Line-Haul Travel	Within SCAB boundarie	46,946	23	132	597	1	15	15	14	51,128	4	1
2018	Line-Haul Travel	Between SCAB Boundar	81,344	39	230	1,034	1	26	26	24	88,590	7	2

Peaking Factor:	236.591

Table B1-262. Line-haul Travel Within SCAB Boundaries Annual

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
2018	Line-Haul Travel	Alameda Corridor	1,584,292	0.382	2.235	10.071	0.009	0.251	0.251	0.231	862.713	0.070	0.023
2018	Line-Haul Travel	East River Bank	88,668	0.021	0.125	0.564	0.000	0.014	0.014	0.013	48.283	0.004	0.001
2018	Line-Haul Travel	BNSF San Bernardino	4,120,861	0.993	5.814	26.195	0.023	0.653	0.653	0.602	2,243.980	0.182	0.059
2018	Line-Haul Travel	BNSF Cajon	1,508,778	0.363	2.129	9.591	0.008	0.239	0.239	0.220	821.592	0.067	0.022
2018	Line-Haul Travel	UP Los Angeles	1,147,377	0.276	1.619	7.293	0.006	0.182	0.182	0.168	624.794	0.051	0.016
2018	Line-Haul Travel	UP Alhambra	1,218,772	0.294	1.720	7.747	0.007	0.193	0.193	0.178	663.672	0.054	0.017
2018	Line-Haul Travel	UP Yuma	1,344,264	0.324	1.897	8.545	0.007	0.213	0.213	0.196	732.008	0.059	0.019
2018	Line-Haul Travel	UP Mojave	94,083	0.023	0.133	0.598	0.001	0.015	0.015	0.014	51.232	0.004	0.001

Table B1-263. Line-haul Travel Between SCAB Boundaries and CA Border Annual Emissions 2018

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
2018	Line-Haul Travel	BNSF Cajon	11,620,025	2.799	16.395	73.865	0.064	1.840	1.840	1.698	6,327.587	0.512	0.167
2018	Line-Haul Travel	UP Yuma	7,006,927	1.688	9.886	44.541	0.039	1.110	1.110	1.024	3,815.563	0.309	0.100
2018	Line-Haul Travel	UP Mojave	618,258	0.149	0.872	3.930	0.003	0.098	0.098	0.090	336.667	0.027	0.009

Table B1-264. Line-haul Travel Total Annual Emissions (tons/yr) 2018

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
2018	Line-Haul Travel	Within SCAB boundaries	11,107,094	2.676	15.672	70.604	0.061	1.759	1.759	1.623	6,048.275	0.490	0.159
2018	Line-Haul Travel	Between SCAB Boundar	19,245,210	4.636	27.154	122.335	0.106	3.048	3.048	2.812	10,479.818	0.849	0.276

One Hour Peak Emissions (lbs/hr):

Table B1-265. Line-haul Travel Within SCAB Boundaries Peak Hourly Emissions 2018

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
2018	Line-Haul Travel	Alameda Corridor	279.01	0.13	0.79	3.55	0.00	0.09	0.09	0.08	303.87	0.02	0.01
2018	Line-Haul Travel	East River Bank	15.62	0.01	0.04	0.20	0.00	0.00	0.00	0.00	17.01	0.00	0.00
2018	Line-Haul Travel	BNSF San Bernardino	725.74	0.35	2.05	9.23	0.01	0.23	0.23	0.21	790.39	0.06	0.02
2018	Line-Haul Travel	BNSF Cajon	265.71	0.13	0.75	3.38	0.00	0.08	0.08	0.08	289.39	0.02	0.01
2018	Line-Haul Travel	UP Los Angeles	202.07	0.10	0.57	2.57	0.00	0.06	0.06	0.06	220.07	0.02	0.01
2018	Line-Haul Travel	UP Alhambra	214.64	0.10	0.61	2.73	0.00	0.07	0.07	0.06	233.76	0.02	0.01
2018	Line-Haul Travel	UP Yuma	236.74	0.11	0.67	3.01	0.00	0.07	0.07	0.07	257.83	0.02	0.01
2018	Line-Haul Travel	UP Mojave	16.57	0.01	0.05	0.21	0.00	0.01	0.01	0.00	18.05	0.00	0.00

Table B1-266. Line-haul Travel Between SCAB Boundaries and CA Border Peak Hourly Emissions 2018

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
2018	Line-Haul Travel	BNSF Cajon	2,046.43	0.99	5.77	26.02	0.02	0.65	0.65	0.60	2,228.73	0.18	0.06
2018	Line-Haul Travel	UP Yuma	1,234.01	0.59	3.48	15.69	0.01	0.39	0.39	0.36	1,343.94	0.11	0.04
2018	Line-Haul Travel	UP Mojave	108.88	0.05	0.31	1.38	0.00	0.03	0.03	0.03	118.58	0.01	0.00

Table B1-267. Line-haul Travel Total Peak Hourly Emissions 2018

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
2018	Line-Haul Travel	Within SCAB boundaries	1,956	0.942	5.520	24.868	0.022	0.620	0.620	0.572	2,130.354	0.172	0.056
2018	Line-Haul Travel	Between SCAB Boundar	3,389	1.633	9.564	43.090	0.037	1.073	1.073	0.990	3,691.255	0.299	0.097

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

Table B1-268. Line-haul Travel Within SCAB Boundaries 8-hr Peak Period Emissions 2018

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
2018	Line-Haul Travel	Alameda Corridor	2,232.11	1.08	6.30	28.38	0.02	0.71	0.71	0.65	2,430.95	0.20	0.06
2018	Line-Haul Travel	East River Bank	124.92	0.06	0.35	1.59	0.00	0.04	0.04	0.04	136.05	0.01	0.00
2018	Line-Haul Travel	BNSF San Bernardino	5,805.88	2.80	16.38	73.81	0.06	1.84	1.84	1.70	6,323.09	0.51	0.17
2018	Line-Haul Travel	BNSF Cajon	2,125.72	1.02	6.00	27.02	0.02	0.67	0.67	0.62	2,315.08	0.19	0.06
2018	Line-Haul Travel	UP Los Angeles	1,616.54	0.78	4.56	20.55	0.02	0.51	0.51	0.47	1,760.55	0.14	0.05
2018	Line-Haul Travel	UP Alhambra	1,717.13	0.83	4.85	21.83	0.02	0.54	0.54	0.50	1,870.10	0.15	0.05
2018	Line-Haul Travel	UP Yuma	1,893.93	0.91	5.34	24.08	0.02	0.60	0.60	0.55	2,062.65	0.17	0.05
2018	Line-Haul Travel	UP Mojave	132.55	0.06	0.37	1.69	0.00	0.04	0.04	0.04	144.36	0.01	0.00

Table B1-269. Line-haul Travel Between SCAB Boundaries and CA Border 8-hr Peak Period Emissions 2018

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
2018	Line-Haul Travel	BNSF Cajon	16,371.46	7.89	46.20	208.14	0.18	5.19	5.19	4.78	17,829.88	1.44	0.47
2018	Line-Haul Travel	UP Yuma	9,872.06	4.76	27.86	125.51	0.11	3.13	3.13	2.88	10,751.50	0.87	0.28
2018	Line-Haul Travel	UP Mojave	871.06	0.42	2.46	11.07	0.01	0.28	0.28	0.25	948.66	0.08	0.02

Table B1-270. Line-haul Travel Total 8-hr Peak Period Emissions 2018

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
2018	Line-Haul Travel	Within SCAB boundarie	15,649	7.539	44.160	198.948	0.172	4.956	4.956	4.573	17,042.832	1.380	0.448
2018	Line-Haul Travel	Between SCAB Boundar	27,115	13.063	76.515	344.716	0.298	8.588	8.588	7.923	29,530.037	2.391	0.777

Analysis Year:	2018

Table B1-271. Line-haul In-yard Peak Daily Emissions (lbs/day) 2018

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
2018	Line-Haul	WBCT (On-Site)	6,908	3.328	19.495	87.829	0.076	2.188	2.188	2.019	7,523.851	0.609	0.198
2018	Line-Haul	UP ICTF Yard	2,765	1.332	7.802	35.149	0.030	0.876	0.876	0.808	3,011.073	0.244	0.079
2018	Line-Haul	BNSF Hobart & Commerce Yards	2,977	1.434	8.400	37.842	0.033	0.943	0.943	0.870	3,241.767	0.262	0.085
2018	Line-Haul	UP East LA Yard	152	0.073	0.428	1.928	0.002	0.048	0.048	0.044	165.188	0.013	0.004
2018	Line-Haul	UP LATC Yard	63	0.030	0.178	0.803	0.001	0.020	0.020	0.018	68.793	0.006	0.002
2018	Line-Haul	UP COI Yard	0	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.066	0.000	0.000
2018	Line-Haul	BNSF SB Yard	4	0.002	0.012	0.055	0.000	0.001	0.001	0.001	4.717	0.000	0.000
2018	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	**5,961**	2.87	16.82	75.78	0.07	1.89	1.89	1.74	6,491.60	0.53	0.17

Table B1-272. Line-haul In-yard Annual Emissions (tons/yr) 2018

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
2018	Line-Haul	WBCT (On-Site)	1,634,472	0.394	2.306	10.390	0.009	0.259	0.259	0.239	890.038	0.072	0.023
2018	Line-Haul	UP ICTF Yard	654,122	0.158	0.923	4.158	0.004	0.104	0.104	0.096	356.197	0.029	0.009
2018	Line-Haul	BNSF Hobart & Commerce Yards	704,238	0.170	0.994	4.477	0.004	0.112	0.112	0.103	383.487	0.031	0.010
2018	Line-Haul	UP East LA Yard	35,885	0.009	0.051	0.228	0.000	0.006	0.006	0.005	19.541	0.002	0.001
2018	Line-Haul	UP LATC Yard	14,944	0.004	0.021	0.095	0.000	0.002	0.002	0.002	8.138	0.001	0.000
2018	Line-Haul	UP COI Yard	14	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.008	0.000	0.000
2018	Line-Haul	BNSF SB Yard	1,025	0.000	0.001	0.007	0.000	0.000	0.000	0.000	0.558	0.000	0.000
2018	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	**1,410,228**	0.34	1.99	8.96	0.01	0.22	0.22	0.21	767.93	0.06	0.02

Peaking Factor:	236.591

Table B1-273. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2018

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
2018	Line-Haul	WBCT (On-Site)	287.85	0.139	0.812	3.660	0.003	0.091	0.091	0.084	313.494	0.025	0.008
2018	Line-Haul	UP ICTF Yard	115.20	0.056	0.325	1.465	0.001	0.036	0.036	0.034	125.461	0.010	0.003
2018	Line-Haul	BNSF Hobart & Commerce Yards	124.03	0.060	0.350	1.577	0.001	0.039	0.039	0.036	135.074	0.011	0.004
2018	Line-Haul	UP East LA Yard	6.32	0.003	0.018	0.080	0.000	0.002	0.002	0.002	6.883	0.001	0.000
2018	Line-Haul	UP LATC Yard	2.63	0.001	0.007	0.033	0.000	0.001	0.001	0.001	2.866	0.000	0.000
2018	Line-Haul	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
2018	Line-Haul	BNSF SB Yard	0.18	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.197	0.000	0.000
2018	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	**248**	0.12	0.70	3.16	0.00	0.08	0.08	0.07	270.48	0.02	0.01

Table B1-274. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2018

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
2018	Line-Haul	WBCT (On-Site)	2,302.81	1.109	6.498	29.276	0.025	0.729	0.729	0.673	2,507.950	0.203	0.066
2018	Line-Haul	UP ICTF Yard	921.59	0.444	2.601	11.716	0.010	0.292	0.292	0.269	1,003.691	0.081	0.026
2018	Line-Haul	BNSF Hobart & Commerce Yards	992.20	0.478	2.800	12.614	0.011	0.314	0.314	0.290	1,080.589	0.087	0.028
2018	Line-Haul	UP East LA Yard	50.56	0.024	0.143	0.643	0.001	0.016	0.016	0.015	55.063	0.004	0.001
2018	Line-Haul	UP LATC Yard	21.06	0.010	0.059	0.268	0.000	0.007	0.007	0.006	22.931	0.002	0.001
2018	Line-Haul	UP COI Yard	0.02	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.000
2018	Line-Haul	BNSF SB Yard	1.44	0.001	0.004	0.018	0.000	0.000	0.000	0.000	1.572	0.000	0.000
2018	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			**1,987**	0.96	5.61	25.26	0.02	0.63	0.63	0.58	2,163.87	0.18	0.06

Analysis Year:	2018

Table B1-275. Switchers In-yard Peak Daily Emissions (lbs/day) 2018

			Peak Day Work	Peak Daily Switcher In-Yard Emissions (lbs/day)									
Year	Type	Rail Yard	hp-hrs/day	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2018	Switchers	WBCT (On-Site)	1,094	0.581	4.345	10.614	0.014	0.090	0.090	0.083	1,613.780	0.121	0.041
2018	Switchers	UP ICTF Yard	299	0.159	1.189	2.905	0.004	0.025	0.025	0.023	441.701	0.033	0.011
2018	Switchers	BNSF Hobart & Commerce Yards	322	0.171	1.280	3.128	0.004	0.026	0.026	0.024	475.542	0.036	0.012
2018	Switchers	UP East LA Yard	16	0.009	0.065	0.159	0.000	0.001	0.001	0.001	24.232	0.002	0.001
2018	Switchers	UP LATC Yard	7	0.004	0.027	0.066	0.000	0.001	0.001	0.001	10.091	0.001	0.000
2018	Switchers	UP COI Yard	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.010	0.000	0.000
2018	Switchers	BNSF SB Yard	0	0.000	0.002	0.005	0.000	0.000	0.000	0.000	0.692	0.000	0.000
2018	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	**645**	0.34	2.56	6.26	0.01	0.05	0.05	0.05	952.27	0.07	0.02

Table B1-276. Switchers In-yard Annual Emissions (tons/yr) 2018

			Annual Work	Annual Switcher In-Yard Emissions (tons/yr)									
Year	Type	Rail Yard	(hp-hr/yr)	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2018	Switchers	WBCT (On-Site)	258,721	0.069	0.514	1.256	0.002	0.011	0.011	0.010	190.903	0.014	0.005
2018	Switchers	UP ICTF Yard	70,813	0.019	0.141	0.344	0.000	0.003	0.003	0.003	52.251	0.004	0.001
2018	Switchers	BNSF Hobart & Commerce Yards	76,239	0.020	0.151	0.370	0.000	0.003	0.003	0.003	56.255	0.004	0.001
2018	Switchers	UP East LA Yard	3,885	0.001	0.008	0.019	0.000	0.000	0.000	0.000	2.867	0.000	0.000
2018	Switchers	UP LATC Yard	1,618	0.000	0.003	0.008	0.000	0.000	0.000	0.000	1.194	0.000	0.000
2018	Switchers	UP COI Yard	2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	0.000
2018	Switchers	BNSF SB Yard	111	0.000	0.000	0.001	0.000	0.000	0.000	0.000	0.082	0.000	0.000
2018	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	**152,668**	0.04	0.30	0.74	0.00	0.01	0.01	0.01	112.65	0.01	0.00

Peaking Factor:	236.591

Table B1-277. Switchers In-yard Peak Hour Emissions (lbs/hr) 2018

			Peak Hour Work	1-hr Switcher In-Yard Peak Emissions (lbs/hr)									
Year	Type	Rail Yard	hp-hrs	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2018	Switchers	WBCT (On-Site)	45.56	0.024	0.181	0.442	0.001	0.004	0.004	0.003	67.241	0.005	0.002
2018	Switchers	UP ICTF Yard	12.47	0.007	0.050	0.121	0.000	0.001	0.001	0.001	18.404	0.001	0.000
2018	Switchers	BNSF Hobart & Commerce Yards	13.43	0.007	0.053	0.130	0.000	0.001	0.001	0.001	19.814	0.001	0.000
2018	Switchers	UP East LA Yard	0.68	0.000	0.003	0.007	0.000	0.000	0.000	0.000	1.010	0.000	0.000
2018	Switchers	UP LATC Yard	0.28	0.000	0.001	0.003	0.000	0.000	0.000	0.000	0.420	0.000	0.000
2018	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2018	Switchers	BNSF SB Yard	0.02	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.029	0.000	0.000
2018	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	**27**	0.01	0.11	0.26	0.00	0.00	0.00	0.00	39.68	0.00	0.00

Table B1-278. Switchers In-yard Eight-Hour Peak Emissions (lbs/hr) 2018

Year	Type	Rail Yard	Peak 8hr Period	8-hr Peak Switcher In-Yard Emissions (lbs/8-hr period)									
			hp-hrs	VOC	CO	NOx	SOx	DPM	PM10	PM2.5	CO2	CH4	N2O
2018	Switchers	WBCT (On-Site)	364.51	0.194	1.448	3.538	0.005	0.030	0.030	0.028	537.927	0.040	0.014
2018	Switchers	UP ICTF Yard	99.77	0.053	0.396	0.968	0.001	0.008	0.008	0.008	147.234	0.011	0.004
2018	Switchers	BNSF Hobart & Commerce Yards	107.41	0.057	0.427	1.043	0.001	0.009	0.009	0.008	158.514	0.012	0.004
2018	Switchers	UP East LA Yard	5.47	0.003	0.022	0.053	0.000	0.000	0.000	0.000	8.077	0.001	0.000
2018	Switchers	UP LATC Yard	2.28	0.001	0.009	0.022	0.000	0.000	0.000	0.000	3.364	0.000	0.000
2018	Switchers	UP COI Yard	0.00	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.000
2018	Switchers	BNSF SB Yard	0.16	0.000	0.001	0.002	0.000	0.000	0.000	0.000	0.231	0.000	0.000
2018	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			**215**	0.11	0.85	2.09	0.00	0.02	0.02	0.02	317.42	0.02	0.01

Year	**2023**

Table B1-279. 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 B1-280. 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 B1-281. 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 B1-282. 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 B1-283. 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 B1-284. 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 B1-285. 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 B1-286. China Shipping Switchers In-yard Activity 2023 - All Scenarios

Activity/Yards	2023 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 B1-287. 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 B1-288. 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 B1-289. 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 B1-290. 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 B1-291. 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 B1-292. 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 B1-293. 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 B1-294. 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 B1-295. 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 B1-296. 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 B1-297. 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 B1-298. 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 B1-299. 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 B1-300. 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 B1-301. 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 B1-302. 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 B1-303. 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 B1-304. 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 B1-305. 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 B1-306. 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 B1-307. 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 B1-308. 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 B1-309. 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 B1-310. 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 B1-311. 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 B1-312. 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 B1-313. 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 B1-314. China Shipping Switchers In-yard Activity 2030 - All Scenarios

Activity/Yards	2030 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 B1-315. 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 B1-316. 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 B1-317. 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 B1-318. 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 B1-319. 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 B1-320. 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 B1-321. 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 B1-322. 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 B1-323. 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 B1-324. 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 B1-325. 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 B1-326. 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 B1-327. 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 B1-328. 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 B1-329. 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 B1-330. 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 B1-331. 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 B1-332. 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 B1-333. 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 B1-334. 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 B1-335. 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 B1-336. 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 B1-337. 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 B1-338. 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 B1-339. 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 B1-340. 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 B1-341. 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 B1-342. China Shipping Switchers In-yard Activity 2036 - All Scenarios

Activity/Yards	2036 **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 B1-343. 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 B1-344. 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 B1-345. 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 B1-346. 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 B1-347. 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 B1-348. 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 B1-349. 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 B1-350. 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 B1-351. 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 B1-352. 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 B1-353. 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 B1-354. 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 B1-355. 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 B1-356. 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 B1-357. Line-haul In-yard Peak Hour Emissions (lbs/hr) 2036

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
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 B1-358. Line-haul In-yard Eight-Hour Peak Emissions (lbs/hr) 2036

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
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 B1-359. 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 B1-360. 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 B1-361. 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 B1-362. 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 B1-363. 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 B1-364. 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 B1-365. 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 B1-366. 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 B1-367. 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 B1-368. 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 B1-369. 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 B1-370. China Shipping Switchers In-yard Activity 2045 - All Scenarios

Activity/Yards	2045 **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 B1-371. 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 B1-372. 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 B1-373. 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 B1-374. 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 B1-375. 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 B1-376. 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 B1-377. 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 B1-378. 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 B1-379. 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 B1-380. 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 B1-381. 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 B1-382. 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 B1-383. 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 B1-384. 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 B1-385. 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 B1-386. 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 B1-387. 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 B1-388. 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 B1-389. 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 B1-390. 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

China Shipping Operations Data Needs

Analysis Year	2008

Table B1-391. On-site Truck Activities in 2008 - Proposed Mitigated

Parameter	Values
Annual number visits	159,384
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	9
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	2

Table B1-392. Port Trucks Age Distribution for Calendar Year Fleet 2008 - Proposed Mitigated

	Calendar Year
Scenario: Actuals	**2008**
% Trips by LNG Trucks	0.0%
Model Year	**(%)**
2013	0.0000
2012	0.0000
2011	0.0000
2010	0.0000
2009	0.0061
2008	0.0041
2007	0.0048
2006	0.0031
2005	0.0117
2004	0.0088
2003	0.0117
2002	0.0230
2001	0.0467
2000	0.0943
1999	0.1029
1998	0.1044
1997	0.0960
1996	0.0999
1995	0.0967
1994	0.0791
1993	0.0573
1992	0.0335
1991	0.0301
1990	0.0240
1989	0.0206
1988	0.0111
1987-	0.0303
TOTAL	1.0000

2008 Baseline On-terminal Truck Emissions

Diesel from LNG trucks' mixed fuel (highlighted)

Table B1-393. Emission Factors 2008 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2008	Heavy Duty Trucks	Diesel	15	6.99	7.96	14.53	28.98	3046	1.84	1.76	0.04	0.06	0.01	0.03	1.94	1.80	1.84	0.02	0.47	0.30	3146.57
2008	Heavy Duty Trucks	LNG	15	6.99	7.96	14.53	28.98	3046	1.84	1.76	0.04	0.06	0.01	0.03	1.94	1.80	0.0277	0.02	0.47	0.30	3146.57
				Idling Emission Factors (g/hr)																	
2008	Heavy Duty Trucks	Diesel	idling	11.55	13.15	48.34	109.52	6714.60	1.74	1.67	0.00	0.00	0.00	0.00	1.74	1.67	1.74	0.06	0.54	0.00	6728.97
2008	Heavy Duty Trucks	LNG	idling	11.55	13.15	48.34	109.52	6714.60	1.74	1.67	0.00	0.00	0.00	0.00	1.74	1.67	0.0261	0.06	0.54	0.00	6728.97

Table B1-394. Annual Running Emissions 2008 Proposed 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
2008	HDT	Diesel	1.5	159,384	1.84	2.10	3.83	7.64	803	0.49	0.46	0.01	0.02	0.00	0.01	0.51	0.47	0.49	0.00	0.12	0.08	829.24
2008	HDT	LNG	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

Table B1-395. Peak Day Running Emissions 2008 Proposed 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
2008	HDT	Diesel	0.00427	15.74	17.92	32.70	65.23	6,855	4.15	3.97	0.08	0.14	0.02	0.06	4.37	4.05	4.15	0.04	1.06	0.67	7081.74
2008	HDT	LNG	0.00427	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

Table B1-396. Annual Idling Emissions 2008 Proposed 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
2008	Heavy Duty Trucks	Diesel	In-Gate	159,384	10	0.34	0.39	1.42	3.21	197	0.051	0.049	0.000	0.000	0.000	0.000	0.051	0.049	0.051	0.002	0.016	0.000	197.04
2008	Heavy Duty Trucks	Diesel	Out-Gate	159,384	6	0.20	0.23	0.85	1.92	118	0.031	0.029	0.000	0.000	0.000	0.000	0.031	0.029	0.031	0.001	0.009	0.000	118.22
2008	Heavy Duty Trucks	Diesel	On-terminal	159,384	9	0.30	0.35	1.27	2.89	177	0.046	0.044	0.000	0.000	0.000	0.000	0.046	0.044	0.046	0.002	0.014	0.000	177.33
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	On-terminal	0	9	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 B1-397. Peak Day Idling 2008 Proposed 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
2008	Heavy Duty Trucks	Diesel	In-Gate	681	10	2.89	3.29	12.09	27.39	1679	0.435	0.416	0.000	0.000	0.000	0.000	0.435	0.416	0.435	0.016	0.134	0.001	1682.68
2008	Heavy Duty Trucks	Diesel	Out-Gate	681	6	1.73	1.97	7.25	16.43	1007	0.261	0.250	0.000	0.000	0.000	0.000	0.261	0.250	0.261	0.010	0.081	0.000	1009.61
2008	Heavy Duty Trucks	Diesel	On-terminal	681	9	2.60	2.96	10.88	24.65	1511	0.392	0.375	0.000	0.000	0.000	0.000	0.392	0.375	0.392	0.014	0.121	0.001	1514.41
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	On-terminal	0	9	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	2008

Table B1-398. On-site truck activities in 2008 - FEIR Mitigated Baseline

Parameter	Values
Annual number visits	159,384
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	9
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	2

Table B1-399. Port Trucks Age Distribution for Calendar Year Fleet 2008 - FEIR Mitigated Baseline

	Calendar Year
Scenario: Mitigated Baseline	**2008**
% Trips by LNG Trucks	0.0%
Model Year	**(%)**
2013	0.0000
2012	0.0000
2011	0.0000
2010	0.0000
2009	0.0061
2008	0.0041
2007	0.0048
2006	0.0031
2005	0.0117
2004	0.0088
2003	0.0117
2002	0.0230
2001	0.0467
2000	0.0943
1999	0.1029
1998	0.1044
1997	0.0960
1996	0.0999
1995	0.0967
1994	0.0791
1993	0.0573
1992	0.0335
1991	0.0301
1990	0.0240
1989	0.0206
1988	0.0111
1987-	0.0303
TOTAL	1.0000

Baseline On-terminal Truck Emissions

(Blue shading = Diesel from LNG trucks' mixed fuel)

Table B1-400. Emission Factors 2008 FEIR Mitigated Baseline

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
				Running Emission Factors (g/mile)																	
2008	Heavy Duty Trucks	Diesel	15	6.99	7.96	14.53	28.98	3046	1.84	1.76	0.04	0.06	0.01	0.03	1.94	1.80	1.84	0.02	0.47	0.30	3146.57
2008	Heavy Duty Trucks	LNG	15	6.99	7.96	14.53	28.98	3046	1.84	1.76	0.04	0.06	0.01	0.03	1.94	1.80	0.0277	0.02	0.47	0.30	3146.57
				Idling Emission Factors (g/hr)																	
2008	Heavy Duty Trucks	Diesel	idling	11.55	13.15	48.34	109.52	6714.60	1.74	1.67	0.00	0.00	0.00	0.00	1.74	1.67	1.74	0.06	0.54	0.00	6728.97
2008	Heavy Duty Trucks	LNG	idling	11.55	13.15	48.34	109.52	6714.60	1.74	1.67	0.00	0.00	0.00	0.00	1.74	1.67	0.0261	0.06	0.54	0.00	6728.97

Table B1-401. Annual Running Emissions 2008 FEIR Mitigated Baseline

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
					Annual Emissions (tons/year)																	
2008	HDT	Diesel	1.5	159,384	1.84	2.10	3.83	7.64	803	0.49	0.46	0.01	0.02	0.00	0.01	0.51	0.47	0.49	0.00	0.12	0.08	829.24
2008	HDT	LNG	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

Table B1-402. Peak Day Running Emissions 2008 FEIR Mitigated Baseline

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2008	HDT	Diesel	0.00427	15.74	17.92	32.70	65.23	6,855	4.15	3.97	0.08	0.14	0.02	0.06	4.37	4.05	4.15	0.04	1.06	0.67	7081.74
2008	HDT	LNG	0.00427	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

Table B1-403. Annual Idling Emissions 2008 FEIR Mitigated Baseline

Year	Source	Fuel	Activity 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
						Annual Emissions (tons/year)																	
2008	Heavy Duty Trucks	Diesel	In-Gate	159,384	10	0.34	0.39	1.42	3.21	197	0.051	0.049	0.000	0.000	0.000	0.000	0.051	0.049	0.051	0.002	0.016	0.000	197.04
2008	Heavy Duty Trucks	Diesel	Out-Gate	159,384	6	0.20	0.23	0.85	1.92	118	0.031	0.029	0.000	0.000	0.000	0.000	0.031	0.029	0.031	0.001	0.009	0.000	118.22
2008	Heavy Duty Trucks	Diesel	On-terminal	159,384	9	0.30	0.35	1.27	2.89	177	0.046	0.044	0.000	0.000	0.000	0.000	0.046	0.044	0.046	0.002	0.014	0.000	177.33
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	On-terminal	0	9	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 B1-404. Peak Day Idling 2008 FEIR Mitigated Baseline

Year	Source	Fuel	Activity 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
						Peak Day Emissions (lb/day)																	
2008	Heavy Duty Trucks	Diesel	In-Gate	681	10	2.89	3.29	12.09	27.39	1679	0.435	0.416	0.000	0.000	0.000	0.000	0.435	0.416	0.435	0.016	0.134	0.001	1682.68
2008	Heavy Duty Trucks	Diesel	Out-Gate	681	6	1.73	1.97	7.25	16.43	1007	0.261	0.250	0.000	0.000	0.000	0.000	0.261	0.250	0.261	0.010	0.081	0.000	1009.61
2008	Heavy Duty Trucks	Diesel	On-terminal	681	9	2.60	2.96	10.88	24.65	1511	0.392	0.375	0.000	0.000	0.000	0.000	0.392	0.375	0.392	0.014	0.121	0.001	1514.41
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	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
2008	Heavy Duty Trucks	LNG	On-terminal	0	9	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	2012

Table B1-405. On-site truck activities in 2012 - Proposed Mitigated

Parameter	Values
Annual number visits	245,650
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	17
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	2

Table B1-406. Port Trucks Age Distribution for Calendar Year Fleet 2012 - Proposed Mitigated

	Calendar Year
Scenario: Proposed Mitigated	**2012**
% Trips by LNG Trucks	10.0%
Model Year	**(%)**
2013	0.0034
2012	0.0131
2011	0.0668
2010	0.0982
2009	0.3833
2008	0.2418
2007	0.1864
2006	0.0002
2005	0.0005
2004	0.0004
2003	0.0003
2002	0.0003
2001	0.0003
2000	0.0017
1999	0.0006
1998	0.0004
1997	0.0005
1996	0.0001
1995	0.0006
1994	0.0000
1993	0.0004
1992	0.0002
1991	0.0001
1990	0.0003
1989	0.0000
1988	0.0000
1987-	0.0001
TOTAL	1.0000

2012 On-terminal Truck Emissions

Diesel from LNG trucks' mixed fuel (shaded cells)

Table B1-407. Emission Factors 2012 Proposed 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
2012	Heavy Duty Trucks	Diesel	15	1.23	1.40	2.96	12.50	2817	0.13	0.13	0.04	0.06	0.01	0.03	0.23	0.16	0.13	0.02	0.08	0.30	2907.52
2012	Heavy Duty Trucks	LNG	15	1.23	1.40	2.96	12.50	2817	0.13	0.13	0.04	0.06	0.01	0.03	0.23	0.16	0.0020	0.02	0.08	0.30	2907.52
				Idling Emission Factors (g/hr)																	
2012	Heavy Duty Trucks	Diesel	idling	3.08	3.51	16.18	70.73	7386.32	0.17	0.16	0.00	0.00	0.00	0.00	0.17	0.16	0.17	0.07	0.14	0.00	7390.86
2012	Heavy Duty Trucks	LNG	idling	3.08	3.51	16.18	70.73	7386.32	0.17	0.16	0.00	0.00	0.00	0.00	0.17	0.16	0.0026	0.07	0.14	0.00	7390.86

Table B1-408. Annual Running Emissions 2012 Proposed 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
2012	HDT	Diesel	1.5	221,085	0.45	0.51	1.08	4.57	1030	0.05	0.05	0.01	0.02	0.00	0.01	0.08	0.06	0.05	0.01	0.03	0.11	1062.86
2012	HDT	LNG	1.5	24,565	0.05	0.06	0.12	0.51	114	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.01	118.10

Table B1-409. Peak Day Running Emissions 2012 Proposed 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
2012	HDT	Diesel	0.00399	3.59	4.08	8.63	36.51	8,224	0.39	0.37	0.10	0.18	0.03	0.08	0.67	0.47	0.39	0.05	0.24	0.87	8488.77
2012	HDT	LNG	0.00399	0.40	0.45	0.96	4.06	914	0.04	0.04	0.01	0.02	0.00	0.01	0.07	0.05	0.00	0.01	0.03	0.10	943.20

Table B1-410. Annual Idling Emissions 2012 Proposed 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
2012	Heavy Duty Trucks	Diesel	In-Gate	221,085	10	0.13	0.14	0.66	2.87	300	0.007	0.007	0.000	0.000	0.000	0.000	0.007	0.007	0.007	0.003	0.006	0.000	300.20
2012	Heavy Duty Trucks	Diesel	Out-Gate	221,085	6	0.08	0.09	0.39	1.72	180	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.002	0.003	0.000	180.12
2012	Heavy Duty Trucks	Diesel	On-terminal	221,085	17	0.21	0.24	1.12	4.88	510	0.012	0.011	0.000	0.000	0.000	0.000	0.012	0.011	0.012	0.005	0.010	0.000	510.33
2012	Heavy Duty Trucks	LNG	In-Gate	24,565	10	0.01	0.02	0.07	0.32	33	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.000	0.001	0.000	33.36
2012	Heavy Duty Trucks	LNG	Out-Gate	24,565	6	0.01	0.01	0.04	0.19	20	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	20.01
2012	Heavy Duty Trucks	LNG	On-terminal	24,565	17	0.02	0.03	0.12	0.54	57	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.001	0.001	0.000	56.70

Table B1-411. Peak Day Idling 2012 Proposed 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
2012	Heavy Duty Trucks	Diesel	In-Gate	883	10	1.00	1.14	5.25	22.94	2396	0.056	0.053	0.000	0.000	0.000	0.000	0.056	0.053	0.056	0.023	0.046	0.001	2397.54
2012	Heavy Duty Trucks	Diesel	Out-Gate	883	6	0.60	0.68	3.15	13.77	1438	0.034	0.032	0.000	0.000	0.000	0.000	0.034	0.032	0.034	0.014	0.028	0.001	1438.53
2012	Heavy Duty Trucks	Diesel	On-terminal	883	17	1.70	1.94	8.92	39.00	4073	0.095	0.091	0.000	0.000	0.000	0.000	0.095	0.091	0.095	0.039	0.079	0.002	4075.82
2012	Heavy Duty Trucks	LNG	In-Gate	98	10	0.11	0.13	0.58	2.55	266	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.000	0.003	0.005	0.000	266.39
2012	Heavy Duty Trucks	LNG	Out-Gate	98	6	0.07	0.08	0.35	1.53	160	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.002	0.003	0.000	159.84
2012	Heavy Duty Trucks	LNG	On-terminal	98	17	0.19	0.22	0.99	4.33	453	0.011	0.010	0.000	0.000	0.000	0.000	0.011	0.010	0.000	0.004	0.009	0.000	452.87

China Shipping Operations Data Needs

Analysis Year	2014

Table B1-412. On-site Truck Activities 2014 - Proposed 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 B1-413. Port Trucks Age Distribution for Calendar Year Fleet 2014 - Proposed Mitigated

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

2014 On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-414. Emission Factors 2014 - Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2014	Heavy Duty Trucks	Diesel	15	0.96	1.09	2.68	11.15	2768	0.06	0.06	0.04	0.06	0.01	0.03	0.16	0.09	0.06	0.02	0.06	0.29	2856.88
2014	Heavy Duty Trucks	LNG	15	0.96	1.09	2.68	11.15	2768	0.06	0.06	0.04	0.06	0.01	0.03	0.16	0.09	0.0030	0.02	0.06	0.29	2856.88
				Idling Emission Factors (g/hr)																	
2014	Heavy Duty Trucks	Diesel	idling	2.38	2.70	14.57	56.52	7360	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.07	0.11	0.00	7363.88
2014	Heavy Duty Trucks	LNG	idling	2.38	2.70	14.57	56.52	7360	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.0009	0.07	0.11	0.00	7363.88

Table B1-415. Annual Running Emissions 2014 - Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2014	HDT	Diesel	1.5	509,432	0.81	0.92	2.26	9.39	2331	0.05	0.05	0.03	0.05	0.01	0.02	0.13	0.08	0.05	0.01	0.05	0.25	2406.44
2014	HDT	LNG	1.5	45,505	0.07	0.08	0.20	0.84	208	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.02	214.95

Table B1-416. Peak Day Running Emissions 2014 - Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2014	HDT	Diesel	0.00416	6.70	7.63	18.80	78.10	19,387	0.42	0.40	0.25	0.43	0.06	0.18	1.10	0.65	0.42	0.12	0.45	2.06	20011.89
2014	HDT	LNG	0.00416	0.60	0.68	1.68	6.98	1732	0.04	0.04	0.02	0.04	0.01	0.02	0.10	0.06	0.00	0.01	0.04	0.18	1787.55

Table B1-417. Annual Idling Emissions 2014 - Proposed Mitigation

Year	Source	Fuel	Activity: 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
						Annual Emissions (tons/year)																	
2014	Heavy Duty Trucks	Diesel	In-Gate	509,432	10	0.22	0.25	1.36	5.29	689	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.007	0.010	0.000	689.20
2014	Heavy Duty Trucks	Diesel	Out-Gate	509,432	6	0.13	0.15	0.82	3.17	413	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.006	0.000	413.52
2014	Heavy Duty Trucks	Diesel	On-terminal	509,432	24	0.53	0.61	3.27	12.69	1653	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.016	0.025	0.001	1654.08
2014	Heavy Duty Trucks	LNG	In-Gate	45,505	10	0.02	0.02	0.12	0.47	62	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	61.56
2014	Heavy Duty Trucks	LNG	Out-Gate	45,505	6	0.01	0.01	0.07	0.28	37	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	36.94
2014	Heavy Duty Trucks	LNG	On-terminal	45,505	24	0.05	0.05	0.29	1.13	148	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	147.75

Table B1-418. Peak Day Idling 2014 - Proposed Mitigation

Year	Source	Fuel	Activity: 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
						Peak Day Emissions (lb/day)																	
2014	Heavy Duty Trucks	Diesel	In-Gate	2,118	10	1.85	2.10	11.34	43.99	5728	0.015	0.014	0.000	0.000	0.000	0.000	0.015	0.014	0.015	0.055	0.086	0.003	5731.29
2014	Heavy Duty Trucks	Diesel	Out-Gate	2,118	6	1.11	1.26	6.80	26.39	3437	0.009	0.008	0.000	0.000	0.000	0.000	0.009	0.008	0.009	0.033	0.052	0.002	3438.77
2014	Heavy Duty Trucks	Diesel	On-terminal	2,118	24	4.44	5.05	27.21	105.57	13748	0.035	0.034	0.000	0.000	0.000	0.000	0.035	0.034	0.035	0.131	0.206	0.006	13755.10
2014	Heavy Duty Trucks	LNG	In-Gate	189	10	0.17	0.19	1.01	3.93	512	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.008	0.000	511.95
2014	Heavy Duty Trucks	LNG	Out-Gate	189	6	0.10	0.11	0.61	2.36	307	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.003	0.005	0.000	307.17
2014	Heavy Duty Trucks	LNG	On-terminal	189	24	0.40	0.45	2.43	9.43	1228	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.012	0.018	0.001	1228.67

China Shipping Operations Data Needs

Analysis Year	2018

Table B1-419. On-site truck activities in 2018 - Proposed Mitigated

Parameter	Values
Annual number visits	525,346
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 B1-420. Port Trucks Age Distribution for Calendar Year Fleet 2018 - Proposed Mitigated

	Calendar Year
Scenario: Proposed Mitigated	**2018**
% Trips by LNG Trucks	8.2%
Model Year	**(%)**
2019	0.0002
2018	0.0009
2017	0.0021
2016	0.0132
2015	0.0279
2014	0.0219
2013	0.0361
2012	0.0534
2011	0.1016
2010	0.1644
2009	0.2604
2008	0.2271
2007	0.0908
TOTAL	1.0000

2018 On-terminal Truck Emissions

Diesel from LNG trucks' mixed fuel

Table B1-421. Emission Factors 2018 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2018	Heavy Duty Trucks	Diesel	15	1.12	1.27	3.05	12.30	2772	0.09	0.09	0.04	0.06	0.01	0.03	0.19	0.12	0.09	0.02	0.08	0.29	2861.33
2018	Heavy Duty Trucks	LNG	15	1.12	1.27	3.05	12.30	2772	0.09	0.09	0.04	0.06	0.01	0.03	0.19	0.12	0.0045	0.02	0.08	0.29	2861.33
				Idling Emission Factors (g/hr)																	
2018	Heavy Duty Trucks	Diesel	idling	2.38	2.71	16.33	56.44	7263.18	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.07	0.11	0.00	7266.92
2018	Heavy Duty Trucks	LNG	idling	2.38	2.71	16.33	56.44	7263.18	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.0010	0.07	0.11	0.00	7266.92

Table B1-422. Annual Running Emissions 2018 Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2018	HDT	Diesel	1.5	482,268	0.89	1.01	2.43	9.81	2211	0.07	0.07	0.03	0.05	0.01	0.02	0.15	0.10	0.07	0.01	0.06	0.23	2281.66
2018	HDT	LNG	1.5	43,078	0.08	0.09	0.22	0.88	197	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.02	203.81

Table B1-423. Peak Day Running Emissions 2018 Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2018	HDT	Diesel	0.00423	7.54	8.58	20.53	82.94	18,689	0.60	0.58	0.24	0.41	0.06	0.18	1.25	0.81	0.60	0.11	0.51	1.97	19287.80
2018	HDT	LNG	0.00423	0.67	0.77	1.83	7.41	1669	0.05	0.05	0.02	0.04	0.01	0.02	0.11	0.07	0.00	0.01	0.05	0.18	1722.88

Table B1-424. Annual Idling Emissions 2018 Proposed Mitigated

Year	Source	Fuel	Activity: 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
						Annual Emissions (tons/year)																	
2018	Heavy Duty Trucks	Diesel	In-Gate	482,268	10	0.21	0.24	1.45	5.00	644	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.006	0.010	0.000	643.86
2018	Heavy Duty Trucks	Diesel	Out-Gate	482,268	6	0.13	0.14	0.87	3.00	386	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.006	0.000	386.32
2018	Heavy Duty Trucks	Diesel	On-terminal	482,268	24	0.51	0.58	3.47	12.00	1544	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.015	0.024	0.001	1545.26
2018	Heavy Duty Trucks	LNG	In-Gate	43,078	10	0.02	0.02	0.13	0.45	57	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	57.51
2018	Heavy Duty Trucks	LNG	Out-Gate	43,078	6	0.01	0.01	0.08	0.27	34	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	34.51
2018	Heavy Duty Trucks	LNG	On-terminal	43,078	24	0.05	0.05	0.31	1.07	138	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	138.03

Table B1-425. Peak Day Idling 2018 Proposed Mitigated

Year	Source	Fuel	Activity: 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
						Peak Day Emissions (lb/day)																	
2018	Heavy Duty Trucks	Diesel	In-Gate	2,038	10	1.78	2.03	12.23	42.27	5440	0.015	0.014	0.000	0.000	0.000	0.000	0.015	0.014	0.015	0.052	0.083	0.002	5442.71
2018	Heavy Duty Trucks	Diesel	Out-Gate	2,038	6	1.07	1.22	7.34	25.36	3264	0.009	0.008	0.000	0.000	0.000	0.000	0.009	0.008	0.009	0.031	0.050	0.001	3265.63
2018	Heavy Duty Trucks	Diesel	On-terminal	2,038	24	4.28	4.87	29.35	101.45	13056	0.035	0.034	0.000	0.000	0.000	0.000	0.035	0.034	0.035	0.125	0.199	0.006	13062.52
2018	Heavy Duty Trucks	LNG	In-Gate	182	10	0.16	0.18	1.09	3.78	486	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.007	0.000	486.17
2018	Heavy Duty Trucks	LNG	Out-Gate	182	6	0.10	0.11	0.66	2.27	292	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.003	0.004	0.000	291.70
2018	Heavy Duty Trucks	LNG	On-terminal	182	24	0.38	0.44	2.62	9.06	1166	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.011	0.018	0.001	1166.80

China Shipping Operations Data Needs

Analysis Year	2023

Table B1-426. On-site Truck Activities 2023 - Proposed 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 B1-427. Port Trucks Age Distribution for Calendar Year Fleet 2023 - Proposed Mitigated

	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

On-terminal Truck Emissions

95% reduction for LNG trucks (highlighted cells)

Table B1-428. Emission Factors 2023 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2023	Heavy Duty Trucks	Diesel	15	0.13	0.15	0.87	7.82	2939	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.05	0.01	0.02	0.01	0.28	3023.11
2023	Heavy Duty Trucks	LNG	15	0.13	0.15	0.87	7.82	2939	0.0120	0.0115	0.04	0.06	0.01	0.03	0.11	0.05	0.0006	0.02	0.01	0.28	3023.11
				Idling Emission Factors (g/hr)																	
2023	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	6259	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.11	0.00	6263.07
2023	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	6259	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.06	0.11	0.00	6263.07

Table B1-429. Annual Running Emissions 2023 Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2023	HDT	Diesel	1.5	618,907	0.14	0.15	0.89	8.00	3008	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.05	0.01	0.02	0.01	0.29	3093.68
2023	HDT	LNG	1.5	55,284	0.01	0.01	0.08	0.71	269	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.03	276.34

Table B1-430. Peak Day Running Emissions 2023 Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2023	HDT	Diesel	0.00405	1.10	1.25	7.18	64.81	24,358	0.10	0.10	0.29	0.50	0.07	0.22	0.90	0.39	0.10	0.13	0.07	2.33	25054.73
2023	HDT	LNG	0.00405	0.10	0.11	0.64	5.79	2176	0.01	0.01	0.03	0.05	0.01	0.02	0.08	0.03	0.00	0.01	0.01	0.21	2238.00

Table B1-431. Annual Idling Emissions 2023 Proposed Mitigated

Year	Source	Fuel	Activity 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
						Annual Emissions (tons/year)																	
2023	Heavy Duty Trucks	Diesel	In-Gate	618,907	10	0.27	0.31	3.98	3.18	712	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.007	0.013	0.000	712.14
2023	Heavy Duty Trucks	Diesel	Out-Gate	618,907	6	0.16	0.18	2.39	1.91	427	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.008	0.000	427.28
2023	Heavy Duty Trucks	Diesel	On-terminal	618,907	24	0.65	0.74	9.55	7.64	1708	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.016	0.030	0.001	1709.13
2023	Heavy Duty Trucks	LNG	In-Gate	55,284	10	0.02	0.03	0.36	0.28	64	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	63.61
2023	Heavy Duty Trucks	LNG	Out-Gate	55,284	6	0.01	0.02	0.21	0.17	38	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	38.17
2023	Heavy Duty Trucks	LNG	On-terminal	55,284	24	0.06	0.07	0.85	0.68	153	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.000	152.67

Table B1-432. Peak Day Idling 2023 Proposed Mitigated

Year	Source	Fuel	Activity 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
						Peak Day Emissions (lb/day)																	
2023	Heavy Duty Trucks	Diesel	In-Gate	2,506	10	2.18	2.48	32.22	25.77	5764	0.009	0.009	0.000	0.000	0.000	0.000	0.009	0.009	0.009	0.055	0.101	0.003	5767.30
2023	Heavy Duty Trucks	Diesel	Out-Gate	2,506	6	1.31	1.49	19.33	15.46	3458	0.006	0.005	0.000	0.000	0.000	0.000	0.006	0.005	0.006	0.033	0.061	0.002	3460.38
2023	Heavy Duty Trucks	Diesel	On-terminal	2,506	24	5.23	5.96	77.33	61.84	13833	0.022	0.021	0.000	0.000	0.000	0.000	0.022	0.021	0.022	0.132	0.243	0.008	13841.53
2023	Heavy Duty Trucks	LNG	In-Gate	224	10	0.19	0.22	2.88	2.30	515	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.009	0.000	515.16
2023	Heavy Duty Trucks	LNG	Out-Gate	224	6	0.12	0.13	1.73	1.38	309	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.005	0.000	309.10
2023	Heavy Duty Trucks	LNG	On-terminal	224	24	0.47	0.53	6.91	5.52	1236	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.012	0.022	0.001	1236.39

China Shipping Operations Data Needs	Analysis Year	2030

Table B1-433. On- site Truck Activities 2030 - Proposed 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 B1-434. Port Trucks Age Distribution for Calendar Year Fleet 2030 - Proposed Mitigated

	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

On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-435. Emission Factors 2030 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2030	Heavy Duty Trucks	Diesel	15	0.08	0.09	0.82	8.19	2342	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.01	0.23	2412.41
2030	Heavy Duty Trucks	LNG	15	0.08	0.09	0.82	8.19	2342	0.0106	0.0101	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.01	0.23	2412.41
				Idling Emission Factors (g/hr)																	
2030	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	5737	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.11	0.00	5740.28
2030	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	5737	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.05	0.11	0.00	5740.28

Table B1-436. Annual Running Emissions 2030 Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2030	HDT	Diesel	1.5	689,334	0.09	0.10	0.94	9.34	2670	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.01	0.02	0.01	0.27	2749.64
2030	HDT	LNG	1.5	61,574	0.01	0.01	0.08	0.83	238	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	245.61

Table B1-437. Peak Day Running Emissions 2030 Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2030	HDT	Diesel	0.00405	0.72	0.82	7.61	75.64	21,623	0.10	0.09	0.33	0.56	0.08	0.24	0.98	0.42	0.10	0.12	0.05	2.16	22268.52
2030	HDT	LNG	0.00405	0.06	0.07	0.68	6.76	1931	0.01	0.01	0.03	0.05	0.01	0.02	0.09	0.04	0.00	0.01	0.00	0.19	1989.13

Table B1-438. Annual Idling Emissions 2030 Proposed Mitigated

Year	Source	Fuel	Activity 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
						Annual Emissions (tons/year)																	
2030	Heavy Duty Trucks	Diesel	In-Gate	689,334	10	0.30	0.34	4.43	3.54	727	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.007	0.014	0.000	726.97
2030	Heavy Duty Trucks	Diesel	Out-Gate	689,334	6	0.18	0.20	2.66	2.13	436	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.008	0.000	436.18
2030	Heavy Duty Trucks	Diesel	On-terminal	689,334	24	0.72	0.82	10.63	8.51	1744	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.017	0.033	0.001	1744.73
2030	Heavy Duty Trucks	LNG	In-Gate	61,574	10	0.03	0.03	0.40	0.32	65	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	64.94
2030	Heavy Duty Trucks	LNG	Out-Gate	61,574	6	0.02	0.02	0.24	0.19	39	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	38.96
2030	Heavy Duty Trucks	LNG	On-terminal	61,574	24	0.06	0.07	0.95	0.76	156	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.000	155.85

Table B1-439. Peak Day Idling 2030 Proposed Mitigated

Year	Source	Fuel	Activity 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
						Peak Day Emissions (lb/day)																	
2030	Heavy Duty Trucks	Diesel	In-Gate	2,791	10	2.43	2.76	35.89	28.70	5884	0.010	0.010	0.000	0.000	0.000	0.000	0.010	0.010	0.010	0.056	0.113	0.003	5887.40
2030	Heavy Duty Trucks	Diesel	Out-Gate	2,791	6	1.46	1.66	21.53	17.22	3530	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.006	0.034	0.068	0.002	3532.44
2030	Heavy Duty Trucks	Diesel	On-terminal	2,791	24	5.83	6.64	86.13	68.88	14121	0.025	0.024	0.000	0.000	0.000	0.000	0.025	0.024	0.025	0.135	0.271	0.007	14129.76
2030	Heavy Duty Trucks	LNG	In-Gate	249	10	0.22	0.25	3.21	2.56	526	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.010	0.000	525.89
2030	Heavy Duty Trucks	LNG	Out-Gate	249	6	0.13	0.15	1.92	1.54	315	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.003	0.006	0.000	315.53
2030	Heavy Duty Trucks	LNG	On-terminal	249	24	0.52	0.59	7.69	6.15	1261	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.012	0.024	0.001	1262.14

China Shipping Operations Data Needs	Analysis Year	2036

Table B1-440. On-site Truck Activities 2036 - Proposed 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 B1-441. Port Trucks Age Distribution for Calendar Year Fleet 2036 - Proposed Mitigated

	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

On-terminal Truck Emissions

95% reduction for LNG trucks (shaded cells)

Table B1-442. Emission Factors 2036 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2036	Heavy Duty Trucks	Diesel	15	0.06	0.06	0.79	8.23	1972	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.00	0.20	2031.96
2036	Heavy Duty Trucks	LNG	15	0.06	0.06	0.79	8.23	1972	0.0097	0.0093	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.00	0.20	2031.96
				Idling Emission Factors (g/hr)																	
2036	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	5113	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.11	0.00	5116.83
2036	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	5113	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.05	0.11	0.00	5116.83

Table B1-443. Annual Running Emissions 2036 Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2036	HDT	Diesel	1.5	694,112	0.06	0.07	0.91	9.44	2264	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.01	0.01	0.00	0.23	2332.07
2036	HDT	LNG	1.5	62,001	0.01	0.01	0.08	0.84	202	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	208.31

Table B1-444. Peak Day Running Emissions 2036 Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2036	HDT	Diesel	0.00405	0.53	0.60	7.34	76.48	18,333	0.09	0.09	0.33	0.56	0.08	0.24	0.98	0.41	0.09	0.10	0.04	1.85	18886.70
2036	HDT	LNG	0.00405	0.05	0.05	0.66	6.83	1638	0.01	0.01	0.03	0.05	0.01	0.02	0.09	0.04	0.00	0.01	0.00	0.17	1687.05

Table B1-445. Annual Idling Emissions 2036 Proposed Mitigated

Year	Source	Fuel	Activity 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
						Annual Emissions (tons/year)																	
2036	Heavy Duty Trucks	Diesel	In-Gate	694,112	10	0.30	0.34	4.46	3.57	652	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.006	0.014	0.000	652.50
2036	Heavy Duty Trucks	Diesel	Out-Gate	694,112	6	0.18	0.21	2.68	2.14	391	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.004	0.008	0.000	391.50
2036	Heavy Duty Trucks	Diesel	On-terminal	694,112	24	0.72	0.83	10.71	8.56	1565	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.015	0.034	0.001	1566.01
2036	Heavy Duty Trucks	LNG	In-Gate	62,001	10	0.03	0.03	0.40	0.32	58	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001	0.000	58.28
2036	Heavy Duty Trucks	LNG	Out-Gate	62,001	6	0.02	0.02	0.24	0.19	35	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	34.97
2036	Heavy Duty Trucks	LNG	On-terminal	62,001	24	0.06	0.07	0.96	0.76	140	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.000	139.88

Table B1-446. Peak Day Idling 2036 Proposed Mitigated

Year	Source	Fuel	Activity 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
						Peak Day Emissions (lb/day)																	
2036	Heavy Duty Trucks	Diesel	In-Gate	2,811	10	2.45	2.78	36.14	28.90	5281	0.010	0.010	0.000	0.000	0.000	0.000	0.010	0.010	0.010	0.050	0.114	0.003	5284.35
2036	Heavy Duty Trucks	Diesel	Out-Gate	2,811	6	1.47	1.67	21.68	17.34	3168	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.006	0.030	0.068	0.002	3170.61
2036	Heavy Duty Trucks	Diesel	On-terminal	2,811	24	5.87	6.68	86.72	69.36	12674	0.025	0.024	0.000	0.000	0.000	0.000	0.025	0.024	0.025	0.121	0.273	0.006	12682.44
2036	Heavy Duty Trucks	LNG	In-Gate	251	10	0.22	0.25	3.23	2.58	472	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.010	0.000	472.02
2036	Heavy Duty Trucks	LNG	Out-Gate	251	6	0.13	0.15	1.94	1.55	283	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.003	0.006	0.000	283.21
2036	Heavy Duty Trucks	LNG	On-terminal	251	24	0.52	0.60	7.75	6.20	1132	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.011	0.024	0.001	1132.85

China Shipping Operations Data Needs	Analysis Year	2045

Table B1-447. On-site Truck Activities 2045 - Proposed 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 B1-448. Port Trucks Age Distribution for Calendar Year Fleet 2045 - Proposed Mitigated

	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

2045 On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-449. Emission Factors 2045 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2045	Heavy Duty Trucks	Diesel	15	0.05	0.05	0.77	8.20	1678	0.01	0.01	0.04	0.06	0.01	0.03	0.10	0.04	0.01	0.01	0.00	0.17	1728.83
2045	Heavy Duty Trucks	LNG	15	0.05	0.05	0.77	8.20	1678	0.0093	0.0089	0.04	0.06	0.01	0.03	0.10	0.04	0.0005	0.01	0.00	0.17	1728.83
				Idling Emission Factors (g/hr)																	
2045	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	4483	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.04	0.11	0.00	4486.01
2045	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	4483	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.04	0.11	0.00	4486.01

Table B1-450. Annual Running Emissions 2045 Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2045	HDT	Diesel	1.5	694,954	0.06	0.06	0.89	9.43	1928	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.01	0.01	0.00	0.20	1986.57
2045	HDT	LNG	1.5	62,077	0.00	0.01	0.08	0.84	172	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	177.45

Table B1-451. Peak Day Running Emissions 2045 Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2045	HDT	Diesel	0.00405	0.45	0.51	7.18	76.35	15,615	0.09	0.08	0.33	0.56	0.08	0.24	0.98	0.41	0.09	0.09	0.03	1.59	16088.66
2045	HDT	LNG	0.00405	0.04	0.05	0.64	6.82	1395	0.01	0.01	0.03	0.05	0.01	0.02	0.09	0.04	0.00	0.01	0.00	0.14	1437.11

Table B1-452. Annual Idling Emissions 2045 Proposed Mitigated

Year	Source	Fuel	Activity: 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
						Annual Emissions (tons/year)																	
2045	Heavy Duty Trucks	Diesel	In-Gate	694,954	10	0.30	0.34	4.47	3.57	572	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.005	0.014	0.000	572.76
2045	Heavy Duty Trucks	Diesel	Out-Gate	694,954	6	0.18	0.21	2.68	2.14	343	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.003	0.008	0.000	343.65
2045	Heavy Duty Trucks	Diesel	On-terminal	694,954	24	0.73	0.83	10.72	8.57	1374	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.013	0.034	0.001	1374.61
2045	Heavy Duty Trucks	LNG	In-Gate	62,077	10	0.03	0.03	0.40	0.32	51	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	51.16
2045	Heavy Duty Trucks	LNG	Out-Gate	62,077	6	0.02	0.02	0.24	0.19	31	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.000	30.70
2045	Heavy Duty Trucks	LNG	On-terminal	62,077	24	0.06	0.07	0.96	0.77	123	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.003	0.000	122.79

Table B1-453. Peak Day Idling 2045 Proposed Mitigated

Year	Source	Fuel	Activity: 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
						Peak Day Emissions (lb/day)																	
2045	Heavy Duty Trucks	Diesel	In-Gate	2,814	10	2.45	2.79	36.18	28.93	4635	0.010	0.010	0.000	0.000	0.000	0.000	0.010	0.010	0.010	0.044	0.114	0.002	4638.49
2045	Heavy Duty Trucks	Diesel	Out-Gate	2,814	6	1.47	1.67	21.71	17.36	2781	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.006	0.027	0.068	0.001	2783.10
2045	Heavy Duty Trucks	Diesel	On-terminal	2,814	24	5.88	6.69	86.82	69.44	11124	0.025	0.024	0.000	0.000	0.000	0.000	0.025	0.024	0.025	0.106	0.273	0.006	11132.38
2045	Heavy Duty Trucks	LNG	In-Gate	251	10	0.22	0.25	3.23	2.58	414	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.004	0.010	0.000	414.33
2045	Heavy Duty Trucks	LNG	Out-Gate	251	6	0.13	0.15	1.94	1.55	248	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.002	0.006	0.000	248.60
2045	Heavy Duty Trucks	LNG	On-terminal	251	24	0.52	0.60	7.76	6.20	994	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.009	0.024	0.000	994.40

China Shipping Operations Data Needs

Analysis Year	2012

Table B1-454. On-site truck activities in 2012 - FEIR Mitigated

Parameter	Values
Annual number visits	245,650
Average Idling Time (min / visit)	
At in-gate	10
At out-gate	6
On-terminal, not including at gate	17
Average On-site Drive	
On-terminal average speed (mph)	15
On-terminal driving distance (mi/visit)	2

Table B1-455. Port Trucks Age Distribution for Calendar Year Fleet 2012 - FEIR Mitigated

	Calendar Year
Scenario: FEIR Mitigated	**2012**
% Trips by LNG Trucks	50.0%
Model Year	**(%)**
2013	0.0034
2012	0.0131
2011	0.0668
2010	0.0982
2009	0.3833
2008	0.2418
2007	0
TOTAL	1.000

2012 On-terminal Truck Emissions

Diesel from LNG trucks' mixed fuel

Table B1-456. Emission Factors 2012 FEIR Mitigated

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
				Running Emission Factors (g/mile)																	
2012	Heavy Duty Trucks	Diesel	15	1.23	1.40	2.96	12.50	2817	0.13	0.13	0.04	0.06	0.01	0.03	0.23	0.16	0.13	0.02	0.08	0.30	2907.52
2012	Heavy Duty Trucks	LNG	15	1.23	1.40	2.96	12.50	2817	0.13	0.13	0.04	0.06	0.01	0.03	0.23	0.16	0.0020	0.02	0.08	0.30	2907.52
				Idling Emission Factors (g/hr)																	
2012	Heavy Duty Trucks	Diesel	idling	3.08	3.51	16.18	70.73	7386.32	0.17	0.16	0.00	0.00	0.00	0.00	0.17	0.16	0.17	0.07	0.14	0.00	7390.86
2012	Heavy Duty Trucks	LNG	idling	3.08	3.51	16.18	70.73	7386.32	0.17	0.16	0.00	0.00	0.00	0.00	0.17	0.16	0.0026	0.07	0.14	0.00	7390.86

Table B1-457. Annual Running Emissions 2012 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
2012	HDT	Diesel	1.5	122,825	0.25	0.28	0.60	2.54	572	0.03	0.03	0.01	0.01	0.00	0.01	0.05	0.03	0.03	0.00	0.02	0.06	590.48
2012	HDT	LNG	1.5	122,825	0.25	0.28	0.60	2.54	572	0.03	0.03	0.01	0.01	0.00	0.01	0.05	0.03	0.00	0.00	0.02	0.06	590.48

Table B1-458. Peak Day Running Emissions 2012 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
2012	HDT	Diesel	0.00399	1.99	2.27	4.80	20.28	4,569	0.22	0.21	0.06	0.10	0.01	0.04	0.37	0.26	0.22	0.03	0.13	0.48	4715.98
2012	HDT	LNG	0.00399	1.99	2.27	4.80	20.28	4569	0.22	0.21	0.06	0.10	0.01	0.04	0.37	0.26	0.00	0.03	0.13	0.48	4715.98

Table B1-459. Annual Idling Emissions 2012 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
2012	Heavy Duty Trucks	Diesel	In-Gate	122,825	10	0.07	0.08	0.37	1.60	167	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.004	0.002	0.003	0.000	166.78
2012	Heavy Duty Trucks	Diesel	Out-Gate	122,825	6	0.04	0.05	0.22	0.96	100	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.002	0.001	0.002	0.000	100.07
2012	Heavy Duty Trucks	Diesel	On-terminal	122,825	17	0.12	0.13	0.62	2.71	283	0.007	0.006	0.000	0.000	0.000	0.000	0.007	0.006	0.007	0.003	0.005	0.000	283.52
2012	Heavy Duty Trucks	LNG	In-Gate	122,825	10	0.07	0.08	0.37	1.60	167	0.004	0.004	0.000	0.000	0.000	0.000	0.004	0.004	0.000	0.002	0.003	0.000	166.78
2012	Heavy Duty Trucks	LNG	Out-Gate	122,825	6	0.04	0.05	0.22	0.96	100	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.001	0.002	0.000	100.07
2012	Heavy Duty Trucks	LNG	On-terminal	122,825	17	0.12	0.13	0.62	2.71	283	0.007	0.006	0.000	0.000	0.000	0.000	0.007	0.006	0.000	0.003	0.005	0.000	283.52

Table B1-460. Peak Day Idling 2012 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
2012	Heavy Duty Trucks	Diesel	In-Gate	490	10	0.56	0.63	2.92	12.75	1331	0.031	0.030	0.000	0.000	0.000	0.000	0.031	0.030	0.031	0.013	0.026	0.001	1331.97
2012	Heavy Duty Trucks	Diesel	Out-Gate	490	6	0.33	0.38	1.75	7.65	799	0.019	0.018	0.000	0.000	0.000	0.000	0.019	0.018	0.019	0.008	0.015	0.000	799.18
2012	Heavy Duty Trucks	Diesel	On-terminal	490	17	0.94	1.08	4.96	21.67	2263	0.053	0.050	0.000	0.000	0.000	0.000	0.053	0.050	0.053	0.022	0.044	0.001	2264.35
2012	Heavy Duty Trucks	LNG	In-Gate	490	10	0.56	0.63	2.92	12.75	1331	0.031	0.030	0.000	0.000	0.000	0.000	0.031	0.030	0.000	0.013	0.026	0.001	1331.97
2012	Heavy Duty Trucks	LNG	Out-Gate	490	6	0.33	0.38	1.75	7.65	799	0.019	0.018	0.000	0.000	0.000	0.000	0.019	0.018	0.000	0.008	0.015	0.000	799.18
2012	Heavy Duty Trucks	LNG	On-terminal	490	17	0.94	1.08	4.96	21.67	2263	0.053	0.050	0.000	0.000	0.000	0.000	0.053	0.050	0.001	0.022	0.044	0.001	2264.35

China Shipping Operations Data Needs

Analysis Year	2014

Table B1-461. 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 B1-462. Port Trucks Age Distribution for Calendar Year Fleet 2014 - FEIR Mitigated

	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

2014 On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-463. Emission Factors 2014 FEIR Mitigated

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
				Running Emission Factors (g/mile)																	
2014	Heavy Duty Trucks	Diesel	15	0.96	1.09	2.68	11.15	2768	0.06	0.06	0.04	0.06	0.01	0.03	0.16	0.09	0.06	0.02	0.06	0.29	2856.88
2014	Heavy Duty Trucks	LNG	15	0.96	1.09	2.68	11.15	2768	0.0600	0.0574	0.04	0.06	0.01	0.03	0.16	0.09	0.0030	0.02	0.06	0.29	2856.88
				Idling Emission Factors (g/hr)																	
2014	Heavy Duty Trucks	Diesel	idling	2.38	2.70	14.57	56.52	7360	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.07	0.11	0.00	7363.88
2014	Heavy Duty Trucks	LNG	idling	2.38	2.70	14.57	56.52	7360	0.0189	0.0181	0.00	0.00	0.00	0.00	0.02	0.02	0.0009	0.07	0.11	0.00	7363.88

Table B1-464. 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	0.26	0.30	0.74	3.07	762	0.02	0.02	0.01	0.02	0.00	0.01	0.04	0.03	0.02	0.00	0.02	0.08	786.42
2014	HDT	LNG	1.5	388,456	0.61	0.70	1.72	7.16	1778	0.04	0.04	0.02	0.04	0.01	0.02	0.10	0.06	0.00	0.01	0.04	0.19	1834.97

Table B1-465. 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	2.19	2.49	6.14	25.52	6,336	0.14	0.13	0.08	0.14	0.02	0.06	0.36	0.21	0.14	0.04	0.15	0.67	6539.83
2014	HDT	LNG	0.00416	5.11	5.82	14.33	59.56	14783	0.32	0.31	0.19	0.33	0.05	0.14	0.84	0.49	0.02	0.09	0.34	1.57	15259.61

Table B1-466. 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	0.07	0.08	0.45	1.73	225	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.002	0.003	0.000	225.23
2014	Heavy Duty Trucks	Diesel	Out-Gate	166,481	6	0.04	0.05	0.27	1.04	135	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.000	135.14
2014	Heavy Duty Trucks	Diesel	On-terminal	166,481	24	0.17	0.20	1.07	4.15	540	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.001	0.005	0.008	0.000	540.55
2014	Heavy Duty Trucks	LNG	In-Gate	388,456	10	0.17	0.19	1.04	4.03	525	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.008	0.000	525.53
2014	Heavy Duty Trucks	LNG	Out-Gate	388,456	6	0.10	0.12	0.62	2.42	315	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.003	0.005	0.000	315.32
2014	Heavy Duty Trucks	LNG	On-terminal	388,456	24	0.41	0.46	2.50	9.68	1261	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.012	0.019	0.001	1261.28

Table B1-467. 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	0.60	0.69	3.71	14.37	1872	0.005	0.005	0.000	0.000	0.000	0.000	0.005	0.005	0.005	0.018	0.028	0.001	1872.97
2014	Heavy Duty Trucks	Diesel	Out-Gate	692	6	0.36	0.41	2.22	8.62	1123	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.003	0.011	0.017	0.000	1123.78
2014	Heavy Duty Trucks	Diesel	On-terminal	692	24	1.45	1.65	8.89	34.50	4493	0.012	0.011	0.000	0.000	0.000	0.000	0.012	0.011	0.012	0.043	0.067	0.002	4495.13
2014	Heavy Duty Trucks	LNG	In-Gate	1,615	10	1.41	1.61	8.65	33.54	4368	0.011	0.011	0.000	0.000	0.000	0.000	0.011	0.011	0.001	0.042	0.065	0.002	4370.27
2014	Heavy Duty Trucks	LNG	Out-Gate	1,615	6	0.85	0.96	5.19	20.12	2621	0.007	0.006	0.000	0.000	0.000	0.000	0.007	0.006	0.000	0.025	0.039	0.001	2622.16
2014	Heavy Duty Trucks	LNG	On-terminal	1,615	24	3.38	3.85	20.75	80.50	10483	0.027	0.026	0.000	0.000	0.000	0.000	0.027	0.026	0.001	0.100	0.157	0.005	10488.64

China Shipping Operations Data Needs

Analysis Year	2018

Table B1-468. On-site truck activities in 2018 - FEIR Mitigated

Parameter	Values
Annual number visits	525,346
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 B1-469. Port Trucks Age Distribution for Calendar Year Fleet 2018 - FEIR Mitigated

	Calendar Year
Scenario: FEIR Mitigated	**2018**
% Trips by LNG Trucks	100.0%
Model Year	**(%)**
2019	0.0002
2018	0.0009
2017	0.0021
2016	0.0132
2015	0.0279
2014	0.0219
2013	0.0361
2012	0.0534
2011	0.1016
2010	0.1644
2009	0.2604
2008	0.2271
2007	0.0908
TOTAL	1.0000

2018 On-terminal Truck Emissions

Diesel from LNG trucks' mixed fuel

Table B1-470. Emission Factors 2018 FEIR Mitigated

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
				Running Emission Factors (g/mile)																	
2018	Heavy Duty Trucks	Diesel	15	1.12	1.27	3.05	12.30	2772	0.09	0.09	0.04	0.06	0.01	0.03	0.19	0.12	0.09	0.02	0.08	0.29	2861.33
2018	Heavy Duty Trucks	LNG	15	1.12	1.27	3.05	12.30	2772	0.09	0.09	0.04	0.06	0.01	0.03	0.19	0.12	0.0045	0.02	0.08	0.29	2861.33
				Idling Emission Factors (g/hr)																	
2018	Heavy Duty Trucks	Diesel	idling	2.38	2.71	16.33	56.44	7263.18	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.07	0.11	0.00	7266.92
2018	Heavy Duty Trucks	LNG	idling	2.38	2.71	16.33	56.44	7263.18	0.02	0.02	0.00	0.00	0.00	0.00	0.02	0.02	0.0010	0.07	0.11	0.00	7266.92

Table B1-471. Annual Running Emissions 2018 FEIR Mitigated

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
					Annual Emissions (tons/year)																	
2018	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
2018	HDT	LNG	1.5	525,346	0.97	1.11	2.65	10.69	2408	0.08	0.07	0.03	0.05	0.01	0.02	0.16	0.10	0.00	0.01	0.07	0.25	2485.47

Table B1-472. Peak Day Running Emissions 2018 FEIR Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2018	HDT	Diesel	0.00423	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
2018	HDT	LNG	0.00423	8.21	9.35	22.37	90.35	20358	0.66	0.63	0.26	0.45	0.07	0.19	1.37	0.89	0.03	0.12	0.55	2.14	21010.67

Table B1-473. Annual Idling Emissions 2018 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
2018	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
2018	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
2018	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
2018	Heavy Duty Trucks	LNG	In-Gate	525,346	10	0.23	0.26	1.58	5.45	701	0.002	0.002	0.000	0.000	0.000	0.000	0.002	0.002	0.000	0.007	0.011	0.000	701.37
2018	Heavy Duty Trucks	LNG	Out-Gate	525,346	6	0.14	0.16	0.95	3.27	421	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.004	0.006	0.000	420.82
2018	Heavy Duty Trucks	LNG	On-terminal	525,346	24	0.55	0.63	3.78	13.07	1682	0.005	0.004	0.000	0.000	0.000	0.000	0.005	0.004	0.000	0.016	0.026	0.001	1683.29

Table B1-474. Peak Day Idling 2018 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
2018	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
2018	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
2018	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
2018	Heavy Duty Trucks	LNG	In-Gate	2,220	10	1.94	2.21	13.32	46.05	5926	0.016	0.015	0.000	0.000	0.000	0.000	0.016	0.015	0.001	0.057	0.090	0.003	5928.88
2018	Heavy Duty Trucks	LNG	Out-Gate	2,220	6	1.17	1.33	7.99	27.63	3555	0.010	0.009	0.000	0.000	0.000	0.000	0.010	0.009	0.000	0.034	0.054	0.002	3557.33
2018	Heavy Duty Trucks	LNG	On-terminal	2,220	24	4.66	5.31	31.98	110.51	14222	0.038	0.037	0.000	0.000	0.000	0.000	0.038	0.037	0.002	0.136	0.217	0.006	14229.32

China Shipping Operations Data Needs

Analysis Year	2023

Table B1-475. 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 B1-476. 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

2023 On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-477. 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	0.13	0.15	0.87	7.82	2939	0.0120	0.0115	0.04	0.06	0.01	0.03	0.11	0.05	0.01	0.02	0.01	0.28	3023.11
2023	Heavy Duty Trucks	LNG	15	0.13	0.15	0.87	7.82	2939	0.0120	0.0115	0.04	0.06	0.01	0.03	0.11	0.05	0.0006	0.02	0.01	0.28	3023.11
				Idling Emission Factors (g/hr)																	
2023	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	6259	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.06	0.11	0.00	6263.07
2023	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	6259	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.06	0.11	0.00	6263.07

Table B1-478. 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	0.15	0.17	0.97	8.72	3276	0.01	0.01	0.04	0.07	0.01	0.03	0.12	0.05	0.00	0.02	0.01	0.31	3370.02

Table B1-479. 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	1.20	1.36	7.82	70.60	26533	0.11	0.10	0.32	0.55	0.08	0.24	0.98	0.42	0.01	0.14	0.08	2.54	27292.73

Table B1-480. 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	0.29	0.33	4.33	3.47	775	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.007	0.014	0.000	775.75
2023	Heavy Duty Trucks	LNG	Out-Gate	674,190	6	0.18	0.20	2.60	2.08	465	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.004	0.008	0.000	465.45
2023	Heavy Duty Trucks	LNG	On-terminal	674,190	24	0.70	0.80	10.40	8.32	1861	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.018	0.033	0.001	1861.80

Table B1-481. Peak Day Idling 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	2.38	2.70	35.10	28.07	6279	0.010	0.010	0.000	0.000	0.000	0.000	0.010	0.010	0.001	0.060	0.110	0.003	6282.47
2023	Heavy Duty Trucks	LNG	Out-Gate	2,730	6	1.43	1.62	21.06	16.84	3767	0.006	0.006	0.000	0.000	0.000	0.000	0.006	0.006	0.000	0.036	0.066	0.002	3769.48
2023	Heavy Duty Trucks	LNG	On-terminal	2,730	24	5.70	6.49	84.24	67.37	15069	0.024	0.023	0.000	0.000	0.000	0.000	0.024	0.023	0.001	0.144	0.265	0.008	15077.92

China Shipping Operations Data Needs

Analysis Year	2030

Table B1-482. 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 B1-483. 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

On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-484. 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	0.08	0.09	0.82	8.19	2342	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.01	0.23	2412.41
2030	Heavy Duty Trucks	LNG	15	0.08	0.09	0.82	8.19	2342	0.0106	0.0101	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.01	0.23	2412.41
				Idling Emission Factors (g/hr)																	
2030	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	5737	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.11	0.00	5740.28
2030	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	5737	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.05	0.11	0.00	5740.28

Table B1-485. 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	0.10	0.11	1.02	10.17	2908	0.01	0.01	0.04	0.08	0.01	0.03	0.13	0.06	0.00	0.02	0.01	0.29	2995.25

Table B1-486. 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	0.78	0.89	8.29	82.40	23554	0.11	0.10	0.36	0.61	0.09	0.26	1.07	0.45	0.01	0.13	0.05	2.36	24257.65

Table B1-487. 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	0.33	0.37	4.83	3.86	791	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.008	0.015	0.000	791.91
2030	Heavy Duty Trucks	LNG	Out-Gate	750,908	6	0.20	0.22	2.90	2.32	475	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.005	0.009	0.000	475.14
2030	Heavy Duty Trucks	LNG	On-terminal	750,908	24	0.78	0.89	11.58	9.27	1899	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.018	0.036	0.001	1900.57

Table B1-488. 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	2.65	3.01	39.09	31.26	6409	0.011	0.011	0.000	0.000	0.000	0.000	0.011	0.011	0.001	0.061	0.123	0.003	6413.29
2030	Heavy Duty Trucks	LNG	Out-Gate	3,041	6	1.59	1.81	23.46	18.76	3846	0.007	0.006	0.000	0.000	0.000	0.000	0.007	0.006	0.000	0.037	0.074	0.002	3847.97
2030	Heavy Duty Trucks	LNG	On-terminal	3,041	24	6.35	7.23	93.82	75.03	15382	0.027	0.026	0.000	0.000	0.000	0.000	0.027	0.026	0.001	0.147	0.295	0.008	15391.90

China Shipping Operations Data Needs

Analysis Year	2036

Table B1-489. 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 B1-490. 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

On-terminal Truck Emissions

95% reduction for LNG trucks

Table B1-491. Emission Factors 2036 FEIR Mitigated

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
				Running Emission Factors (g/mile)																	
2036	Heavy Duty Trucks	Diesel	15	0.06	0.06	0.79	8.23	1972	0.01	0.01	0.04	0.06	0.01	0.03	0.11	0.04	0.01	0.01	0.00	0.20	2031.96
2036	Heavy Duty Trucks	LNG	15	0.06	0.06	0.79	8.23	1972	0.0097	0.0093	0.04	0.06	0.01	0.03	0.11	0.04	0.0005	0.01	0.00	0.20	2031.96
				Idling Emission Factors (g/hr)																	
2036	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	5113	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.05	0.11	0.00	5116.83
2036	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	5113	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.05	0.11	0.00	5116.83

Table B1-492. 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	0.07	0.08	0.99	10.29	2466	0.01	0.01	0.04	0.08	0.01	0.03	0.13	0.06	0.00	0.01	0.00	0.25	2540.38

Table B1-493. 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	0.57	0.65	7.99	83.31	19971	0.10	0.09	0.36	0.61	0.09	0.26	1.07	0.45	0.00	0.11	0.04	2.02	20573.74

Table B1-494. 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	0.33	0.37	4.86	3.89	710	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.007	0.015	0.000	710.79
2036	Heavy Duty Trucks	LNG	Out-Gate	756,113	6	0.20	0.22	2.92	2.33	426	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.004	0.009	0.000	426.47
2036	Heavy Duty Trucks	LNG	On-terminal	756,113	24	0.79	0.90	11.67	9.33	1705	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.016	0.037	0.001	1705.89

Table B1-495. 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	2.66	3.03	39.36	31.48	5752	0.011	0.011	0.000	0.000	0.000	0.000	0.011	0.011	0.001	0.055	0.124	0.003	5756.37
2036	Heavy Duty Trucks	LNG	Out-Gate	3,062	6	1.60	1.82	23.62	18.89	3451	0.007	0.007	0.000	0.000	0.000	0.000	0.007	0.007	0.000	0.033	0.074	0.002	3453.82
2036	Heavy Duty Trucks	LNG	On-terminal	3,062	24	6.39	7.28	94.47	75.55	13806	0.027	0.026	0.000	0.000	0.000	0.000	0.027	0.026	0.001	0.132	0.297	0.007	13815.29

China Shipping Operations Data Needs

Analysis Year	2045

Table B1-496. 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 B1-497. 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

2045 On-terminal Truck Emissions

95% reduction for LNG trucks (shaded cells)

Table B1-498. Emission Factors 2045 FEIR Mitigated

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
				Running Emission Factors (g/mile)																	
2045	Heavy Duty Trucks	Diesel	15	0.05	0.05	0.77	8.20	1678	0.01	0.01	0.04	0.06	0.01	0.03	0.10	0.04	0.01	0.01	0.00	0.17	1728.83
2045	Heavy Duty Trucks	LNG	15	0.05	0.05	0.77	8.20	1678	0.0093	0.0089	0.04	0.06	0.01	0.03	0.10	0.04	0.0005	0.01	0.00	0.17	1728.83
				Idling Emission Factors (g/hr)																	
2045	Heavy Duty Trucks	Diesel	idling	2.37	2.70	34.99	27.98	4483	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.04	0.11	0.00	4486.01
2045	Heavy Duty Trucks	LNG	idling	2.37	2.70	34.99	27.98	4483	0.0101	0.0096	0.00	0.00	0.00	0.00	0.01	0.01	0.0005	0.04	0.11	0.00	4486.01

Table B1-499. Annual Running Emissions 2045 FEIR Mitigated

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
					Annual Emissions (tons/year)																	
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	0.06	0.07	0.97	10.27	2100	0.01	0.01	0.04	0.08	0.01	0.03	0.13	0.05	0.00	0.01	0.00	0.21	2164.02

Table B1-500. Peak Day Running Emissions 2045 FEIR Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
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	0.49	0.56	7.83	83.17	17010	0.09	0.09	0.36	0.61	0.09	0.26	1.06	0.44	0.00	0.10	0.03	1.73	17525.77

Table B1-501. Annual Idling Emissions 2045 FEIR Mitigated

Year	Source	Fuel	Activity 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
						Annual Emissions (tons/year)																	
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	0.33	0.37	4.87	3.89	623	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.006	0.015	0.000	623.92
2045	Heavy Duty Trucks	LNG	Out-Gate	757,031	6	0.20	0.22	2.92	2.33	374	0.001	0.001	0.000	0.000	0.000	0.000	0.001	0.001	0.000	0.004	0.009	0.000	374.35
2045	Heavy Duty Trucks	LNG	On-terminal	757,031	24	0.79	0.90	11.68	9.34	1496	0.003	0.003	0.000	0.000	0.000	0.000	0.003	0.003	0.000	0.014	0.037	0.001	1497.40

Table B1-502. Peak Day Idling 2045 FEIR Mitigated

Year	Source	Fuel	Activity 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
						Peak Day Emissions (lb/day)																	
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	2.67	3.04	39.41	31.52	5049	0.011	0.011	0.000	0.000	0.000	0.000	0.011	0.011	0.001	0.048	0.124	0.003	5052.83
2045	Heavy Duty Trucks	LNG	Out-Gate	3,065	6	1.60	1.82	23.64	18.91	3029	0.007	0.007	0.000	0.000	0.000	0.000	0.007	0.007	0.000	0.029	0.074	0.002	3031.70
2045	Heavy Duty Trucks	LNG	On-terminal	3,065	24	6.40	7.29	94.58	75.64	12118	0.027	0.026	0.000	0.000	0.000	0.000	0.027	0.026	0.001	0.116	0.297	0.006	12126.78

Table B1-503. 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

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

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.

2008 On-terminal Truck Road Dust Emissions

Table B1-504. Annual Emissions 2008 Actual Baseline

Year	Source	Distance travelled per year (miles)	Annual Emissions (tons/year) PM10	Annual Emissions (tons/year) PM2.5	Emission factor (g/mile) PM10	Emission factor (g/mile) PM2.5
2008	HDT	239,076	0.85	0.13	3.24	0.49

Table B1-505. Peak Day Emissions 2008 Actual Baseline

Year	Source	Peak Day Factor (annual to peak)	Peak Day Emissions (lb/day) PM10	Peak Day Emissions (lb/day) PM2.5
2008	HDT	0.00427	7.29	1.09

Table B1-506. 8 hr Emissions 2008 Actual Baseline

Year	Source	Peak Factor (day to 8hr peak)	Peak 8hr Emissions (lb/8 hr) PM10	Peak 8hr Emissions (lb/8 hr) PM2.5
2008	HDT	0.61939	4.52	0.68

Table B1-507. 1 hr Emissions 2008 Actual Baseline

Year	Source	Peak Factor (day to 1 hr	Peak 1 hr Emissions (lb/hr) PM10	Peak 1 hr Emissions (lb/hr) PM2.5
2008	HDT	0.08860	0.65	0.10

Table B1-508. Emissions Broken Down by Fuel Type 2008 Actual Baseline

Year	Source	Fuel	Period	PM 10	PM25	Unit
2008	HDT	Diesel	Annual	0.85	0.13	tons/year
2008	HDT	LNG	Annual	0.00	0.00	tons/year
2008	HDT	Diesel	Day	7.29	1.09	lbs/day
2008	HDT	LNG	Day	0.00	0.00	lbs/day
2008	HDT	Diesel	8 hr	4.52	0.68	lbs/8hr
2008	HDT	LNG	8 hr	0.00	0.00	lbs/8hr
2008	HDT	Diesel	1 hr	0.65	0.10	lbs/hr
2008	HDT	LNG	1hr	0.00	0.00	lbs/hr

2012 On-terminal Truck Road Dust Emissions

Table B1-509. Annual Emissions 2012 Proposed Mitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2012	HDT	368,474	1.32	0.20	3.24	0.49

Table B1-510. Peak Day Emissions 2012 Proposed Mitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2012	HDT	0.00399	10.51	1.58

Table B1-511. 8 hr Emissions 2012 Proposed Mitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2012	HDT	0.49168	5.17	0.78

Table B1-512. 1 hr Emissions 2012 Proposed Mitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2012	HDT	0.07026	0.74	0.11

Table B1-513. Emissions Broken Down by Fuel Rype 2012 Proposed Mitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2012	HDT	Diesel	Annual	1.18	0.18	tons/year
2012	HDT	LNG	Annual	0.13	0.02	tons/year
2012	HDT	Diesel	Day	9.46	1.42	lbs/day
2012	HDT	LNG	Day	1.05	0.16	lbs/day
2012	HDT	Diesel	8 hr	4.65	0.70	lbs/8hr
2012	HDT	LNG	8 hr	0.52	0.08	lbs/8hr
2012	HDT	Diesel	1 hr	0.66	0.10	lbs/hr
2012	HDT	LNG	1hr	0.07	0.01	lbs/hr

2014 On-terminal Truck Road Dust Emissions

Table B1-514. Annual Road Dust Emissions 2014 Proposed Mitigated

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

Table B1-515. Peak Day Road Dust Emissions 2014 Proposed Mitigated

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

Table B1-516. 8 hr Road Dust Emissions 2014 Proposed Mitigated

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

Table B1-517. 1 hr Road Dust Emissions 2014 Proposed Mitigated

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

Table B1-518. Road Dust Emissions BrokenDown by FuelType 2014 Proposed Mitigated

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

2018 On-terminal Truck Road Dust Emissions

Table B1-519. Annual Emissions 2018 Proposed Mitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2018	HDT	788,019	2.81	0.42	3.24	0.49

Table B1-520. Peak Day Emissions 2018 Proposed Mitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2018	HDT	0.00423	23.79	3.57

Table B1-521. 8 hr Emissions 2018 Proposed Mitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2018	HDT	0.49309	11.73	1.76

Table B1-522. 1 hr Emissions 2018 Proposed Mitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2018	HDT	0.07087	1.69	0.25

Table B1-523. Emissions Broken Down by Fuel Type 2018 Proposed Mitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2018	HDT	Diesel	Annual	0.00	0.00	tons/year
2018	HDT	LNG	Annual	2.81	0.42	tons/year
2018	HDT	Diesel	Day	0.00	0.00	lbs/day
2018	HDT	LNG	Day	23.79	3.57	lbs/day
2018	HDT	Diesel	8 hr	0.00	0.00	lbs/8hr
2018	HDT	LNG	8 hr	11.73	1.76	lbs/8hr
2018	HDT	Diesel	1 hr	0.00	0.00	lbs/hr
2018	HDT	LNG	1hr	1.69	0.25	lbs/hr

Future Year On-terminal Truck Road Dust Emissions

Table B1-524. Annual Road Dust Emissions 2023 Proposed Mitigated

			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 B1-525. Peak Day Road Dust Emissions 2023 Proposed Mitigated

		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 B1-526. 8 hr Road Dust Emissions 2023 Proposed Mitigated

		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 B1-527. 1 hr Road Dust Emissions 2023 Proposed Mitigated

		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 B1-528. Road Dust Emissions Broken Down by Fuel Type 2023 Proposed Mitigated

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 B1-529. Annual Road Dust Emissions 2030 Proposed Mitigated

			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 B1-530. Peak Day Road Dust Emissions 2030 Proposed Mitigated

		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 B1-531. 8 hr Road Dust Emissions 2030 Proposed Mitigated

		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 B1-532. 1 hr Road Dust Emissions 2030 Proposed Mitigated

		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 B1-533. Road Dust Emissions broken down by Fuel Type 2030 Proposed Mitigated

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 B1-534. Annual Road Dust Emissions 2036 Proposed Mitigated

			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 B1-535. Peak Day Road Dust Emissions 2036 Proposed Mitigated

		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 B1-536. 8 h Roar Dust Emissions 2036 Proposed Mitigated

		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 B1-537. 1 hr Road Dust Emissions 2036 Proposed Mitigated

		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 B1-538. Road Dust Emissions Broken Down by Fuel Type 2036 Proposed Mitigated

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 B1-539. Annual Road Dust Emissions 2045 Proposed Mitigated

			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 B1-540. Peak Day Road Dust Emissions 2045 Proposed Mitigated.

		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 B1-541. 8 hr Road Dust Emissions 2045 Proposed Mitigated

		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 B1-542. 1 hr Road Dust Emissions 2045 Proposed Mitigated

		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 B1-543. Road Dust Emissions Broken Down by Fuel Type 2045 Proposed Mitigated

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
(Passenger Cars)

China Shipping Operations Data Needs

Analysis Year	2008

Table B-544. On-site Passenger Car activities in 2008 - Actual Baseline

Parameter	Values
Annual number visits	110,303
Average Idling Time (min / visit)	
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/visit)	0.6

2008 On-terminal PC Emissions

Table B1-545. Emission Factors 2008 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2008	Passenger Cars	Agg	15	0.26	0.35	5.00	0.41	545.58	0.01	0.01	0.01	0.04	0.00	0.02	0.05	0.03	0	0.01	0.05	0.03	555.11
				Start Exhaust Emission Factors (g/trip)																	
2008	Passenger Cars	Agg	start exh	0.85	0.93	3.90	0.53	74.77	0.00	0.00	0.00	0.00	0.00	0.00	0.005	0.004	0.00	0.00	0.15	0.04	91.32

Table B1-546. Annual Running Emissions 2008 Proposed Mitigated

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
					Annual Emissions (tons/year)																	
2008	PC	Agg	0.6	110,303	0.02	0.03	0.36	0.03	40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.50

Table B1-547. Peak Day Running Emissions 2008 Proposed Mitigated

Year	Source	Fuel	Peak Day Factor (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
				Peak Day Emissions (lb/day)																	
2008	PC	Agg	0.00427	0.16	0.22	3.11	0.26	340	0.01	0.01	0.00	0.02	0.00	0.01	0.03	0.02	0.00	0.00	0.03	0.02	345.85

Table B1-548. Annual Start Emissions 2008 Proposed 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
2008	Passenger Cars	Agg	In-Gate	110,303	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
2008	Passenger Cars	Agg	Out-Gate	110,303	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
2008	Passenger Cars	Agg	On-terminal	110,303	0	0.10	0.11	0.47	0.06	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	11.10

Table B1-549. Peak Day Start 2008 Proposed 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
2008	Passenger Cars	Agg	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
2008	Passenger Cars	Agg	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
2008	Passenger Cars	Agg	On-terminal	471	0	0.88	0.96	4.05	0.55	77.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.04	94.83

China Shipping Operations Data Needs

Analysis Year	2012

Table B1-550. On-site Passenger Car Activities in 2012 - Proposed Mitigated

Parameter	Values
Annual number visits	117,946
Average Idling Time (min / visit)	
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/visit)	0.6

2012 On-terminal PC Emissions

Table B1-551. Emission Factors 2012 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2012	Passenger Cars	Gas	15	0.17	0.23	3.46	0.27	523.29	0.01	0.01	0.01	0.04	0.00	0.02	0.05	0.02	0	0.01	0.03	0.02	529.86
				Start Exhaust Emission Factors (g/trip)																	
2012	Passenger Cars	Gas	start exh	0.64	0.71	3.16	0.41	70.09	0.00	0.00	0.00	0.00	0.00	0.00	0.003	0.003	0.00	0.00	0.12	0.04	84.23

Table B1-552. Annual Running Emissions 2012 Proposed 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
2012	PC	Gas	0.6	117,946	0.01	0.02	0.27	0.02	41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	41.33

Table B1-553. Peak Day Running Emissions 2012 Proposed 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
2012	PC	Gas	0.00399	0.10	0.15	2.16	0.17	326	0.00	0.00	0.00	0.02	0.00	0.01	0.03	0.01	0.00	0.00	0.02	0.01	330.12

Table B1-554. Annual Start Emissions 2012 Proposed 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
2012	Passenger Cars	Gas	In-Gate	117,946	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
2012	Passenger Cars	Gas	Out-Gate	117,946	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
2012	Passenger Cars	Gas	On-terminal	117,946	0	0.08	0.09	0.41	0.05	9.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	10.95

Table B1-555. Peak Day Start 2012 Proposed 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
2012	Passenger Cars	Gas	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
2012	Passenger Cars	Gas	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
2012	Passenger Cars	Gas	On-terminal	471	0	0.67	0.73	3.28	0.42	72.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.04	87.46

China Shipping Operations Data Needs

Analysis Year	2014

Table B1-556. On-site Passenger Car Activities 2014 - Proposed Mitigated

Parameter	Values
Annual number of visits	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

2014 On-terminal PC Emissions

Table B1-557. Emission Factors 2014 Proposed Mitigated

Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10brea	PM2.5tire	PM2.5brea	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
			Running Emission Factors (g/mile)																	
2014	Passenger Cars	15	0.12	0.17	2.64	0.19	499.42	0.005	0.005	0.01	0.04	0.00	0.02	0.05	0.02	0	0.005	0.03	0.01	504.46
			Start Exhaust Emission Factors (g/trip)																	
2014	Passenger Cars	start exh	0.52	0.57	2.85	0.34	66.37	0.003	0.002	0	0	0	0	0.003	0.002	0	0.001	0.10	0.03	79.11

Table B1-558. Annual Running Emissions 2014 Proposed Mitigated

				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	0.20	0.01	37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.79

Table B1-559. Peak D ay Running Emissions 2014 Proposed Mitigated

		Peak Day	Peak Day Emissions (lb/day)																	
Year	Source	Factor	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	0.08	0.11	1.65	0.12	311	0.00	0.00	0.00	0.02	0.00	0.01	0.03	0.01	0.00	0.00	0.02	0.01	314.29

Table B1-560. Annual Start Emissions 2014 Proposed Mitigated

		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	0.07	0.07	0.36	0.04	8.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	9.88

Table B1-561. Peak Day Start 2014 Proposed Mitigated

		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	0.54	0.59	2.96	0.35	68.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.04	82.15

China Shipping Operations Data Needs

Analysis Year	2018

Table B1-562. On-site Passenger Car activities in 2018 - Proposed Mitigated

Parameter	Values
Annual number visits	227,577
Average Idling Time (min / visit)	
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/visit)	0.6

2018 On-terminal PC Emissions

Table B1-563. Emission Factors 2018 Proposed Mitigated

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
				Running Emission Factors (g/mile)																	
2018	Passenger Cars	Gas	15	0.05	0.08	1.51	0.10	461.97	0.00	0.00	0.01	0.04	0.00	0.02	0.05	0.02	0	0.00	0.01	0.01	464.94
				Start Exhaust Emission Factors (g/trip)																	
2018	Passenger Cars	Gas	start exh	0.33	0.37	2.41	0.24	60.61	0.00	0.00	0.00	0.00	0.00	0.00	0.002	0.002	0.00	0.00	0.07	0.03	71.20

Table B1-564. Annual Running Emissions 2018 Proposed 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
2018	PC	Gas	0.6	227,577	0.01	0.01	0.23	0.01	70	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	69.98

Table B1-565. Peak Day Running Emissions 2018 Proposed 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
2018	PC	Gas	0.00423	0.07	0.10	1.92	0.12	588	0.01	0.01	0.01	0.05	0.00	0.02	0.06	0.03	0.00	0.01	0.02	0.01	591.58

Table B1-566. Annual Start Emissions 2018 Proposed 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
2018	Passenger Cars	Gas	In-Gate	227,577	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
2018	Passenger Cars	Gas	Out-Gate	227,577	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
2018	Passenger Cars	Gas	On-terminal	227,577	0	0.08	0.09	0.60	0.06	15.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	17.86

Table B1-567. Peak Day Start 2018 Proposed 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
2018	Passenger Cars	Gas	In-Gate	962	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
2018	Passenger Cars	Gas	Out-Gate	962	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
2018	Passenger Cars	Gas	On-terminal	962	0	0.71	0.78	5.11	0.52	128.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.06	150.99

China Shipping Operations Data Needs

Analysis Year	2023

Table B1-568. On-site Passenger Car Activities 2023 Proposed Mitigated

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

2023 On-terminal PC Emissions

Table B1-569. Emission Factors 2023 Proposed Mitigated

Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10breal	PM2.5tire	PM2.5breal	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
			Running Emission Factors (g/mile)																	
2023	Passenger Cars	15	0.02	0.03	0.94	0.05	406.54	0.004	0.004	0.01	0.04	0.00	0.02	0.05	0.02	0	0.004	0.01	0.01	408.37
			Start Exhaust Emission Factors (g/trip)																	
2023	Passenger Cars	start exh	0.21	0.23	2.09	0.17	53.28	0.002	0.002	0	0	0	0	0.002	0.002	0	0.001	0.05	0.02	61.82

Table B1-570. Annual Running Emissions 2023 Proposed Mitigated

				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
=B8	PC	0.6	287,091	0.00	0.01	0.18	0.01	77	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	77.54

Table B1-571. Peak Day Running Emissions 2 023 Proposed Mitigated

		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
2023	PC	0.00405	0.04	0.05	1.45	0.07	625	0.01	0.01	0.01	0.06	0.00	0.02	0.07	0.03	0.00	0.01	0.01	0.01	627.98

Table B1-572. Annual Start Emissions 2023 Proposed Mitigated

		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	0.07	0.07	0.66	0.06	16.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	19.56

Table B1-573. Peak Day Start 2023 Proposed Mitigated

		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
=A21	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	0.53	0.58	5.36	0.45	136.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.06	158.43

China Shipping Operations Data Needs

Analysis Year	2030

Table B1-574. On-site Passenger Car Activities 2030 Proposed Mitigated

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

2030 On-terminal PC Emissions

Table B1-575. Emission Factors 2030 Proposed Mitigated

			Running Emission Factors (g/mile)																	
Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10breal	PM2.5tire	PM2.5breal	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
2030	Passenger Cars	15	0.01	0.02	0.69	0.03	342.40	0.003	0.003	0.01	0.04	0.00	0.02	0.05	0.02	0	0.003	0.00	0.00	343.74
			Start Exhaust Emission Factors (g/trip)																	
2030	Passenger Cars	start exh	0.12	0.13	1.66	0.13	44.63	0.001	0.001	0	0	0	0	0.001	0.001	0	0.000	0.03	0.02	51.26

Table B1-576. Annual Running Emissions 2030 Proposed Mitigated

				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	0.14	0.01	72	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	71.80

Table B1-577. Peak Day Running Emissions 2030 Proposed Mitigated

		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	0.02	0.03	1.17	0.05	579	0.00	0.00	0.01	0.06	0.00	0.03	0.08	0.03	0.00	0.01	0.01	0.01	581.45

Table B1-578. Annual Start Emissions 2030 Proposed Mitigated

		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	0.04	0.05	0.58	0.04	15.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	17.85

Table B1-579. Peak Day Start 2030 Proposed Mitigated

		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	0.34	0.37	4.68	0.36	125.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.06	144.52

China Shipping Operations Data Needs

Analysis Year	2036

Table B1-580. On-site Passenger Car Activities 2036 Proposed Mitigated

Parameter	Values
Annual number of visits	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

2036 On-terminal PC Emissions

Table B1-581. Emission Factors 2036 Proposed Mitigated

Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10breal	PM2.5tire	PM2.5breal	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
			Running Emission Factors (g/mile)																	
2036	Passenger Cars	15	0.01	0.01	0.62	0.02	317.53	0.002	0.002	0.01	0.04	0.00	0.02	0.05	0.02	0	0.003	0.00	0.00	318.77
			Start Exhaust Emission Factors (g/trip)																	
2036	Passenger Cars	start exh	0.08	0.09	1.47	0.11	40.83	0.001	0.001	0	0	0	0	0.001	0.001	0	0.000	0.02	0.02	46.90

Table B1-582. Annual Running Emissions 2036 Proposed Mitigated

Year	Source	On-terminal distance (miles/visit)	No. of visits per year	Annual Emissions (tons/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	0.13	0.00	66	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	66.09

Table B1-583. Peak Day Running Emissions 2036 Proposed Mitigated

Year	Source	Peak Day Factor (annual	Peak Day Emissions (lb/day) 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	0.01	0.02	1.04	0.04	533	0.00	0.00	0.01	0.06	0.00	0.03	0.08	0.03	0.00	0.01	0.00	0.01	535.25

Table B1-584. Annual Start Emissions 2036 Proposed Mitigated

		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	0.03	0.03	0.51	0.04	14.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	16.21

Table B1-585. Peak Day Start 2036 Proposed Mitigated

		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	0.24	0.26	4.12	0.32	114.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.05	131.26

China Shipping Operations Data Needs

Analysis Year	2045

Table B1-586. On-site Passenger Car Activities 2045 Proposed Mitigated

Parameter	Values
Annual number of visits	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

2045 On-terminal PC Emissions

Table B1-587. Emission Factors 2045 Proposed Mitigated

Year	Source	Average speed bin (mph)	VOC	TOG	CO	NOx	CO2	PM10	PM2.5	PM10tire	PM10breal	PM2.5tire	PM2.5breal	PM10 Total	PM2.5 Total	DPM	SOx	CH4	N2O	CO2e
			Running Emission Factors (g/mile)																	
2045	Passenger Cars	15	0.005	0.01	0.58	0.02	306.42	0.001	0.001	0.01	0.04	0.00	0.02	0.05	0.02	0	0.003	0.00	0.00	307.62
			Start Exhaust Emission Factors (g/trip)																	
2045	Passenger Cars	start exh	0.06	0.07	1.35	0.11	38.79	0.001	0.001	0	0	0	0	0.001	0.001	0	0.000	0.02	0.02	44.69

Table B1-588. Annual Running Emissions 2045 Proposed Mitigated

				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	0.12	0.00	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	64.91

Table B1-589. Peak Day Running Emissions 2045 Proposed Mitigated

		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	0.01	0.01	1.00	0.04	524	0.00	0.00	0.01	0.06	0.00	0.03	0.08	0.03	0.00	0.01	0.00	0.01	525.69

Table B1-590. Annual Start Emissions 2045 Proposed Mitigated

		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	0.02	0.02	0.48	0.04	13.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	15.72

Table B1-591. Peak Day Start 2045 Proposed Mitigated

		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	0.18	0.20	3.85	0.32	110.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	127.30

Table B1-592. 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.

2008 On-terminal PC Fugitive Dust Emissions

Table B1-593. Annual Road Dust Emissions 2008 Proposed Mitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2008	PC	66,182	0.03	0.00	0.39	0.06

Table B1-594. Peak Day Emissions 2008 Proposed Mitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2008	PC	0.00427	0.25	0.04

Table B1-595. 8 hr Emissions 2008 Proposed Mitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2008	PC	0.61939	0.15	0.02

Table B1-596. 1 hr Emissions 2008 Proposed Mitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2008	PC	0.08860	0.02	0.00

Table B1-597. Emissions Broken Down by Fuel Type 2008 Proposed Mitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2008	PC	Aggregate	Annual	0.03	0.00	tons/year
2008	PC	Aggregate	Day	0.25	0.04	lbs/day
2008	PC	Aggregate	8 hr	0.15	0.02	lbs/8hr
2008	PC	Aggregate	1 hr	0.02	0.00	lbs/hr

2012 On-terminal PC Fugitive Dust Emissions

Table B1-598. Annual Emissions 2012 Proposed Mitigated

			Annual Emissions (tons/year)		Emission factor (g/mile)	
Year	Source	Distance travelled per year (miles)	PM10	PM2.5	PM10	PM2.5
2012	PC	70,768	0.03	0.00	0.39	0.06

Table B1-599. Peak Day Emissions 2012 Proposed Mitigated

		Peak Day Factor	Peak Day Emissions (lb/day)	
Year	Source	(annual to peak)	PM10	PM2.5
2012	PC	0.00399	0.25	0.04

Table B1-600. 8 hr Emissions 2012 Proposed Mitigated

		Peak Factor	Peak 8hr Emissions (lb/8 hr)	
Year	Source	(day to 8hr peak)	PM10	PM2.5
2012	PC	0.49168	0.12	0.02

Table B1-601. 1 hr Emissions 2012 Proposed Mitigated

		Peak Factor	Peak 1 hr Emissions (lb/hr)	
Year	Source	(day to 1 hr	PM10	PM2.5
2012	PC	0.07026	0.02	0.00

Table B1-602. Emissions Broken Down by Fuel Type 2012 Proposed Mitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2012	PC	Aggregate	Annual	0.03	0.00	tons/year
2012	PC	Aggregate	Day	0.25	0.04	lbs/day
2012	PC	Aggregate	8 hr	0.12	0.02	lbs/8hr
2012	PC	Aggregate	1 hr	0.02	0.00	lbs/hr

2014 On-terminal PC Fugitive Dust Emissions

Table B1-603. Annual Emissions 2014 Proposed Mitigated

			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 B1-604. Peak Day Emissions 2014 Proposed Mitigated

		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 B1-605. 8 hr Emissions 2014 Proposed Mitigated

		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 B1-606. 1 hr Emissions 2014 Proposed Mitigated

		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 B1-607. Emissions Broken Down by Fuel Type 2014 Proposed Mitigated

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

2018 On-terminal PC Fugitive Dust Emissions

Table B1-608. Annual Emissions 2018 Proposed Mitigated

Year	Source	Distance travelled per year (miles)	Annual Emissions (tons/year) PM10	Annual Emissions (tons/year) PM2.5	Emission factor (g/mile) PM10	Emission factor (g/mile) PM2.5
2018	PC	136,546	0.06	0.01	0.39	0.06

Table B1-609. Peak Day Emissions 2018 Proposed Mitigated

Year	Source	Peak Day Factor (annual to peak)	Peak Day Emissions (lb/day) PM10	Peak Day Emissions (lb/day) PM2.5
2018	PC	0.00423	0.50	0.08

Table B1-610. 8 hr Emissions 2018 Proposed Mitigated

Year	Source	Peak Factor (day to 8hr peak)	Peak 8hr Emissions (lb/8 hr) PM10	Peak 8hr Emissions (lb/8 hr) PM2.5
2018	PC	0.49309	0.25	0.04

Table B1-611. 1 hr Emissions 2018 Proposed Mitigated

Year	Source	Peak Factor (day to 1 hr	Peak 1 hr Emissions (lb/hr) PM10	Peak 1 hr Emissions (lb/hr) PM2.5
2018	PC	0.07087	0.04	0.01

Table B1-612. Emissions Broken Down by Fuel Type 2018 Proposed Mitigated

Year	Source	Fuel	Period	PM 10	PM25	Unit
2018	PC	Aggregate	Annual	0.06	0.01	tons/year
2018	PC	Aggregate	Day	0.50	0.08	lbs/day
2018	PC	Aggregate	8 hr	0.25	0.04	lbs/8hr
2018	PC	Aggregate	1 hr	0.04	0.01	lbs/hr

Future Year On-terminal PC Fugitive Dust Emissions

Table B1-613. Annual Emissions 2023 Proposed Mitigated

Year	Source	Distance travelled per year (miles)	Annual Emissions (tons/year) PM10	Annual Emissions (tons/year) PM2.5	Emission factor (g/mile) PM10	Emission factor (g/mile) PM2.5
2023	PC	172,254	0.07	0.01	0.39	0.06

Table B1-614. Peak Day Emissions 2023 Proposed Mitigated

Year	Source	Peak Day Factor (annual to peak)	Peak Day Emissions (lb/day) PM10	Peak Day Emissions (lb/day) PM2.5
2023	PC	0.00405	0.61	0.09

Table B1-615. 8 hr Emissions 2023 Proposed Mitigated

Year	Source	Peak Factor (day to 8hr peak)	Peak 8hr Emissions (lb/8 hr) PM10	Peak 8hr Emissions (lb/8 hr) PM2.5
2023	PC	0.52972	0.32	0.05

Table B1-616. 1 hr Emissions 2023 Proposed Mitigated

Year	Source	Peak Factor (day to 1 hr	Peak 1 hr Emissions (lb/hr) PM10	Peak 1 hr Emissions (lb/hr) PM2.5
2023	PC	0.07369	0.04	0.01

Table B1-617. Emissions Broken Down by Fuel Type 2023 Proposed Mitigated

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 B1-618. Annual Emissions 2030 Proposed Mitigated

			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 B1-619. Peak Day Emissions 2030 Proposed Mitigated

		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 B1-620. 8 hr Emissions 2030 Proposed Mitigated

		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 B1-621. 1 hr Emissions 2030 Proposed Mitigated

		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 B1-622. Emissions Broken Down by Fuel Type 2030 Proposed Mitigated

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 B1-623. Annual Emissions 2036 Proposed Mitigated

Year	Source	Distance travelled per year (miles)	Annual Emissions (tons/year)		Emission factor (g/mile)	
			PM10	PM2.5	PM10	PM2.5
2036	PC	188,091	0.08	0.01	0.39	0.06

Table B1-624. Peak Day Emissions 2036 Proposed Mitigated

Year	Source	Peak Day Factor (annual to peak)	Peak Day Emissions (lb/day)	
			PM10	PM2.5
2036	PC	0.00405	0.66	0.10

Table B1-625. 8 hr Emissions 2036 Proposed Mitigated

Year	Source	Peak Factor (day to 8hr peak)	Peak 8hr Emissions (lb/8 hr)	
			PM10	PM2.5
2036	PC	0.52972	0.35	0.05

Table B1-626. 1 hr Emissions 2036 Proposed Mitigated

Year	Source	Peak Factor (day to 1 hr	Peak 1 hr Emissions (lb/hr)	
			PM10	PM2.5
2036	PC	0.07369	0.05	0.01

Table B1-627. Emissions Broken Down by Fuel Type 2036 Proposed Mitigated

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 B1-628. Annual Emissions 2045 Proposed Mitigated

			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 B1-629. Peak Day Emissions 2045 Proposed Mitigated

		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 B1-630. 8 hr Emissions 2045 Proposed Mitigated

		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 B1-631. 1 hr Emissions 2045 Proposed Mitigated

		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 B1-632. Emissions Broken Down by Fuel Type 2045 Proposed Mitigated

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	2008

Table B1-633. Manuevering Time Duration 2008

Transit zone	Hrs
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-634. Tug Characteristics 2008

Tug	Fleetwide Average MY	# of Engines	HP per Engine	Hours/Year	Load Factor
Average Tug Main	1995	2.0	1951	1327	0.31
Average Tug Auxiliary	1999	2.0	138	1178	0.43

Table B1-635. Tug Engine Composite Emission Factors 2008

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.50	0.46	0.50	11.69	0.01	3.16	0.77	486.19	0.02	0.01
Auxiliary	0.38	0.35	0.38	7.74	0.01	3.93	0.83	486.08	0.02	0.01

Analysis Year	2012

Table B1-636. Manuevering Time Duration 2012

Transit zone	Hrs
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-637. Tug Characteristics 2012

Tug	Fleetwide Average MY	# of Engines	HP per Engine	Hours/Year	Load Factor
Average Tug Main	2005	2.2	2069	1480	0.31
Average Tug Auxiliary	2008	2.0	187	1743	0.43

Table B1-638. Tug Engine Composite Emission Factors 2012

Tug Engine	Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.24	0.22	0.24	6.59	0.01	3.69	0.57	486.28	0.02	0.01
Auxiliary	0.17	0.16	0.17	5.10	0.01	3.84	0.63	486.46	0.02	0.01

Analysis Year	2014

Table B1-639. 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 B1-640. 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 B1-641. Manuevering Time Duration 2014

Transit zone	Hrs
Within breakwater	0.5
Precautionary zone	0.0
Shift (anchorage to berth)	0.3

Analysis Year	2018

Table B1-642. Manuevering Time Duration 2008

Transit zone	Hrs
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-643. Tug Characteristics 2018

Tug	Fleetwide Average MY	# of Engines	HP per Engine	Hours/Year	Load Factor
Average Tug Main	2016	2.2	2069	1480	0.31
Average Tug Auxiliary	2007	2.0	187	1743	0.43

Table B1-644. Tug Engine Composite Emission Factors 2018

Tug Engine	2018 Composite EF (g/HP-hr)									
	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Main	0.03	0.03	0.03	1.26	0.01	3.82	0.13	486.28	0.02	0.01
Auxiliary	0.15	0.14	0.15	5.16	0.01	4.02	0.63	486.46	0.02	0.01

Analysis Year	2023

Table B1-645. 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 B1-646. 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 B1-647. Manuevering Time Duration 2023

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Analysis Year	2030

Table B1-648. 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 B1-649. 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 B1-650. Manuevering Time Duration 2030

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Analysis Year	2036

Table B1-651. 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 B1-652. 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 B1-653. Manuevering Time Duration 2036

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Analysis Year	2045

Table B1-654. 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 B1-655. 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 B1-656. Manuevering Time Duration 2045

Transit zone	Hrs
Precautionary zone	0.0
Within breakwater	0.5
Shift (anchorage to berth)	0.3

Table B1-657. Harbor Craft Annual Emissions Summary - All Scenarios

Ship category	Transits	Tons per year									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Base Year 2008											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	4	0.00	0.00	0.00	0.09	0.00	0.03	0.01	3.84	0.00	0.00
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	28	0.02	0.02	0.02	0.56	0.00	0.16	0.04	24.18	0.00	0.00
Containerships 4,000 - 5,000 TEU	18	0.02	0.02	0.02	0.38	0.00	0.11	0.03	16.32	0.00	0.00
Containerships 3,000 - 4,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 2,000 - 3,000 TEU	1	0.00	0.00	0.00	0.02	0.00	0.01	0.00	0.86	0.00	0.00
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-	-
Total	51	0.05	0.04	0.05	1.05	0.00	0.30	0.07	45.21	0.00	0.00
Project Year 2012											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	42	0.02	0.02	0.02	0.58	0.00	0.34	0.05	44.12	0.00	0.00
Containerships 8,000 - 9,000 TEU	9	0.00	0.00	0.00	0.12	0.00	0.07	0.01	9.26	0.00	0.00
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	51	0.03	0.02	0.03	0.71	0.00	0.41	0.06	53.38	0.00	0.00
Project Year 2014											
Containerships 10,000 - 11,000 TEU	63	0.03	0.03	0.03	0.80	0.00	0.45	0.07	57.60	0.00	0.00
Containerships 9,000 - 10,000 TEU	14	0.01	0.01	0.01	0.18	0.00	0.10	0.02	12.97	0.00	0.00
Containerships 8,000 - 9,000 TEU	67	0.03	0.03	0.03	0.85	0.00	0.47	0.08	60.69	0.00	0.00
Containerships 6,000 - 7,000 TEU	17	0.01	0.01	0.01	0.21	0.00	0.11	0.02	14.81	0.00	0.00
Containerships 5,000 - 6,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 4,000 - 5,000 TEU	2	0.00	0.00	0.00	0.02	0.00	0.01	0.00	1.74	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	163	0.08	0.07	0.08	2.06	0.00	1.14	0.18	147.82	0.01	0.00
Project Year 2018											
Containerships 10,000 - 11,000 TEU	4	0.00	0.00	0.00	0.01	0.00	0.03	0.00	4.11	0.00	0.00
Containerships 9,000 - 10,000 TEU	4	0.00	0.00	0.00	0.01	0.00	0.03	0.00	4.11	0.00	0.00
Containerships 8,000 - 9,000 TEU	4	0.00	0.00	0.00	0.01	0.00	0.03	0.00	4.11	0.00	0.00
Containerships 6,000 - 7,000 TEU	40	0.00	0.00	0.00	0.14	0.00	0.32	0.01	41.15	0.00	0.00
Containerships 5,000 - 6,000 TEU	12	0.00	0.00	0.00	0.04	0.00	0.10	0.00	12.34	0.00	0.00
Containerships 4,000 - 5,000 TEU	108	0.01	0.01	0.01	0.39	0.00	0.90	0.04	113.40	0.01	0.00
Containerships 3,000 - 4,000 TEU	12	0.00	0.00	0.00	0.04	0.00	0.10	0.00	12.34	0.00	0.00
Containerships 2,000 - 3,000 TEU	96	0.01	0.01	0.01	0.34	0.00	0.78	0.04	99.22	0.00	0.00
Containerships 1,000 - 2,000 TEU	-	-	-	-	-	-	-	-	-	-	-
General Cargo Vessels	-	-	-	-	-	-	-	-	-	-	-
Total	280	0.02	0.02	0.02	0.99	0.00	2.30	0.11	290.79	0.01	0.01

Table B1-657. Harbor Craft Annual Emissions Summary - All Scenarios (continued)

Ship category	Transits	Tons per year									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Project Year 2023											
Containerships 12,000 - 13,000 TEU	104	0.01	0.00	0.01	0.22	0.00	0.69	0.02	82.75	0.00	0.00
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	104	0.01	0.00	0.01	0.22	0.00	0.69	0.02	82.75	0.00	0.00
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	104	0.01	0.00	0.01	0.22	0.00	0.69	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	312	0.02	0.01	0.02	0.67	0.00	2.06	0.07	248.25	0.01	0.01
Project Year 2030											
Containerships 12,000 - 13,000 TEU	104	0.01	0.01	0.01	0.33	0.00	0.83	0.04	93.70	0.00	0.00
Containerships 9,000 - 10,000 TEU	104	0.01	0.01	0.01	0.33	0.00	0.83	0.04	93.70	0.00	0.00
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	104	0.01	0.01	0.01	0.33	0.00	0.83	0.04	93.70	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	312	0.02	0.02	0.02	0.99	0.00	2.49	0.12	281.10	0.01	0.01
Project Year 2036											
Containerships 12,000 - 13,000 TEU	104	0.01	0.01	0.01	0.35	0.00	0.88	0.04	93.70	0.00	0.00
Containerships 9,000 - 10,000 TEU	104	0.01	0.01	0.01	0.35	0.00	0.88	0.04	93.70	0.00	0.00
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	104	0.01	0.01	0.01	0.35	0.00	0.88	0.04	93.70	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	312	0.03	0.03	0.03	1.04	0.00	2.64	0.13	281.10	0.01	0.01
Project Year 2045											
Containerships 12,000 - 13,000 TEU	104	0.01	0.01	0.01	0.31	0.00	0.78	0.04	93.70	0.00	0.00
Containerships 9,000 - 10,000 TEU	104	0.01	0.01	0.01	0.31	0.00	0.78	0.04	93.70	0.00	0.00
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	104	0.01	0.01	0.01	0.31	0.00	0.78	0.04	93.70	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	312	0.02	0.02	0.02	0.94	0.00	2.34	0.11	281.10	0.01	0.01

Table B1-658. Harbor Craft Peak Daily Emissions Summary - All Scenarios

Ship category	Transits	Lbs per day									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Base Year 2008											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	1	1.74	1.60	1.74	40.27	0.02	11.47	2.75	1,727.46	0.08	0.04
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	1	1.74	1.60	1.74	40.27	0.02	11.47	2.75	1,727.46	0.08	0.04
Project Year 2012											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	1	0.98	0.90	0.98	27.26	0.02	15.68	2.42	2,057.40	0.09	0.04
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	1	0.98	0.90	0.98	27.26	0.02	15.68	2.42	2,057.40	0.09	0.04
Project Year 2014											
Containerships 10,000 - 11,000 TEU	2	1.80	1.66	1.80	48.56	0.04	26.95	4.33	3,484.09	0.16	0.07
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	1.80	1.66	1.80	48.56	0.04	26.95	4.33	3,484.09	0.16	0.07
Project Year 2018											
Containerships 10,000 - 11,000 TEU	-	0.08	0.07	0.08	3.13	0.01	7.26	0.33	919.46	0.04	0.02
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	2	0.42	0.38	0.42	17.13	0.05	39.74	1.83	5,034.26	0.23	0.10
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	0.49	0.45	0.49	20.26	0.06	47.00	2.17	5,953.72	0.27	0.12

Table B1-658. Harbor Craft Peak Daily Emissions Summary - All Scenarios (continued)

Ship category	Transits	Lbs per day									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Project Year 2023											
Containerships 12,000 - 13,000 TEU	1	0.13	0.12	0.13	5.79	0.02	14.38	0.68	1,742.05	0.08	0.04
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	1	0.19	0.17	0.19	8.37	0.03	20.81	0.98	2,520.57	0.11	0.05
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	1	0.13	0.12	0.13	5.79	0.02	14.38	0.68	1,742.05	0.08	0.04
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	0.45	0.41	0.45	19.94	0.06	49.57	2.34	6,004.67	0.27	0.12
Project Year 2030											
Containerships 12,000 - 13,000 TEU	1	0.15	0.14	0.15	6.13	0.02	15.44	0.76	1,742.05	0.08	0.04
Containerships 9,000 - 10,000 TEU	2	0.22	0.20	0.22	8.86	0.03	22.34	1.09	2,520.57	0.11	0.05
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.15	0.14	0.15	6.13	0.02	15.44	0.76	1,742.05	0.08	0.04
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	4	0.52	0.48	0.52	21.11	0.06	53.22	2.60	6,004.67	0.27	0.12
Project Year 2036											
Containerships 12,000 - 13,000 TEU	1	0.17	0.16	0.17	6.42	0.02	16.35	0.82	1,742.05	0.08	0.04
Containerships 9,000 - 10,000 TEU	2	0.25	0.23	0.25	9.29	0.03	23.66	1.19	2,520.57	0.11	0.05
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.17	0.16	0.17	6.42	0.02	16.35	0.82	1,742.05	0.08	0.04
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	4	0.59	0.54	0.59	22.12	0.06	56.35	2.83	6,004.67	0.27	0.12
Project Year 2045											
Containerships 12,000 - 13,000 TEU	1	0.13	0.12	0.13	5.81	0.02	14.51	0.68	1,742.05	0.08	0.04
Containerships 9,000 - 10,000 TEU	2	0.19	0.17	0.19	8.41	0.03	21.00	0.99	2,520.57	0.11	0.05
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.13	0.12	0.13	5.81	0.02	14.51	0.68	1,742.05	0.08	0.04
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	4	0.45	0.42	0.45	20.04	0.06	50.02	2.36	6,004.67	0.27	0.12

Table B1-659. Harbor Craft Peak 8-hr Emissions Summary - All Scenarios

Ship category	Transits	Lbs per day									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Base Year 2008											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	1	1.74	1.60	1.74	40.27	0.02	11.47	2.75	1,727.46	0.08	0.04
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	1	1.74	1.60	1.74	40.27	0.02	11.47	2.75	1,727.46	0.08	0.04
Total	2	3.48	3.21	3.48	80.54	0.04	22.93	5.50	3,454.91	0.16	0.09
Project Year 2012											
Containerships 10,000 - 11,000 TEU	1	0.98	0.90	0.98	27.26	0.02	15.68	2.42	2,057.40	0.09	0.04
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	1	0.98	0.90	0.98	27.26	0.02	15.68	2.42	2,057.40	0.09	0.04
Total	2	1.95	1.81	1.95	54.51	0.04	31.36	4.84	4,114.81	0.19	0.08
Project Year 2014											
Containerships 10,000 - 11,000 TEU	2	0.27	0.25	0.27	7.71	0.01	4.94	0.80	626.34	0.03	0.01
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	0.27	0.25	0.27	7.71	0.01	4.94	0.80	626.34	0.03	0.01
Project Year 2018											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	1	0.27	0.25	0.27	11.07	0.03	25.68	1.19	3,252.70	0.15	0.07
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	1	0.27	0.25	0.27	11.07	0.03	25.68	1.19	3,252.70	0.15	0.07
Total	2	0.54	0.49	0.54	22.13	0.07	51.35	2.37	6,505.39	0.29	0.13

Table B1-659. Harbor Craft Peak 8-hr Emissions Summary - All Scenarios (continued)

Ship category	Transits	Lbs per day									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Project Year 2023											
Containerships 12,000 - 13,000 TEU	1	0.05	0.05	0.05	2.23	0.01	5.53	0.26	670.02	0.03	0.01
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	1	0.08	0.07	0.08	3.52	0.01	8.74	0.41	1,059.28	0.05	0.02
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	1	0.03	0.03	0.03	1.43	0.00	3.56	0.17	430.73	0.02	0.01
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	0.16	0.15	0.16	7.17	0.02	17.83	0.84	2,160.02	0.10	0.04
Project Year 2030											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	2	0.09	0.08	0.09	3.72	0.01	9.39	0.46	1,059.28	0.05	0.02
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.06	0.05	0.06	2.36	0.01	5.94	0.29	670.02	0.03	0.01
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	4	0.15	0.14	0.15	6.08	0.02	15.33	0.75	1,729.30	0.08	0.04
Project Year 2036											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	2	0.10	0.09	0.10	3.90	0.01	9.94	0.50	1,059.28	0.05	0.02
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.07	0.06	0.07	2.47	0.01	6.29	0.32	670.02	0.03	0.01
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	4	0.17	0.16	0.17	6.37	0.02	16.23	0.81	1,729.30	0.08	0.04
Project Year 2045											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	2	0.08	0.07	0.08	3.54	0.01	8.82	0.42	1,059.28	0.05	0.02
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.05	0.05	0.05	2.24	0.01	5.58	0.26	670.02	0.03	0.01
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	4	0.13	0.12	0.13	5.77	0.02	14.40	0.68	1,729.30	0.08	0.04

Table B1-660. Harbor Craft Peak Hour Emissions Summary - All Scenarios

Ship category	Transits	Lbs per hour									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Base Year 2008											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 6,000 - 7,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	1	1.74	1.60	1.74	40.27	0.02	11.47	2.75	1,727.46	0.08	0.04
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	1	1.74	1.60	1.74	40.27	0.02	11.47	2.75	1,727.46	0.08	0.04
Project Year 2012											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	1	0.98	0.90	0.98	27.26	0.02	15.68	2.42	2,057.40	0.09	0.04
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	1	0.98	0.90	0.98	27.26	0.02	15.68	2.42	2,057.40	0.09	0.04
Project Year 2014											
Containerships 10,000 - 11,000 TEU	-	0.27	0.25	0.27	7.71	0.01	4.94	0.80	626.34	0.03	0.01
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	-	0.27	0.25	0.27	7.71	0.01	4.94	0.80	626.34	0.03	0.01
Project Year 2018											
Containerships 10,000 - 11,000 TEU	-	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-	-

Table B1-660. Harbor Craft Peak Hour Emissions Summary - All Scenarios (continued)

Ship category	Transits	Lbs per hour									
		PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Project Year 2023											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 5,000 - 6,000 TEU	1	-	-	-	-	-	-	-	-	-	-
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	-	-	-	-	-	-	-	-	-	-
Project Year 2030											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.06	0.05	0.06	2.36	0.01	5.94	0.29	670.02	0.03	0.01
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	0.06	0.05	0.06	2.36	0.01	5.94	0.29	670.02	0.03	0.01
Project Year 2036											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.07	0.06	0.07	2.47	0.01	6.29	0.32	670.02	0.03	0.01
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	0.07	0.06	0.07	2.47	0.01	6.29	0.32	670.02	0.03	0.01
Project Year 2045											
Containerships 12,000 - 13,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 9,000 - 10,000 TEU	1	-	-	-	-	-	-	-	-	-	-
Containerships 8,000 - 9,000 TEU	-	-	-	-	-	-	-	-	-	-	-
Containerships 7,000 - 8,000 TEU	1	0.05	0.05	0.05	2.24	0.01	5.58	0.26	670.02	0.03	0.01
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	0.05	0.05	0.05	2.24	0.01	5.58	0.26	670.02	0.03	0.01

2008 EIR/EIS
Mitigated Emissions Inventory
(FEIR Mitigated Scenario)

Table B1-661. FEIR Mitigated Scenario Annual Emissions by Source Category and Analysis Year in ton/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	2008	40.94	54.78	1.05	15.66	171.71	0.09	0.73	199.50	13.08	497.57
	2012	57.32	48.89	0.71	15.61	108.02	0.07	0.49	176.47	12.06	419.65
	2014	92.76	181.51	2.06	33.28	213.86	0.06	0.35	171.44	12.59	707.91
	2018	11.54	302.31	0.99	32.48	206.41	0.08	0.30	202.64	11.65	768.39
	2023	19.18	279.30	0.93	22.58	110.17	0.06	0.19	243.95	11.96	688.32
	2030	14.97	222.03	0.99	25.62	96.31	0.05	0.13	177.25	8.50	545.84
	2036	17.07	144.29	1.04	25.84	88.85	0.04	0.11	114.60	5.98	397.81
	2045	17.38	63.73	0.94	25.84	97.57	0.04	0.11	62.08	3.81	271.49
Sum of VOC	2008	4.05	2.77	0.08	2.69	10.92	0.12	0.24	10.43	0.69	31.98
	2012	12.86	4.28	0.07	0.96	3.33	0.10	0.15	8.71	0.60	31.07
	2014	29.40	6.67	0.19	1.85	5.41	0.07	0.11	7.52	0.56	51.79
	2018	5.00	16.76	0.11	1.89	6.17	0.09	0.08	7.69	0.46	38.26
	2023	14.77	9.72	0.12	1.32	1.47	0.07	0.04	8.74	0.44	36.69
	2030	7.39	18.08	0.13	1.40	1.03	0.04	0.02	6.10	0.31	34.50
	2036	15.03	18.08	0.14	1.39	0.80	0.03	0.01	3.88	0.22	39.59
	2045	16.17	18.08	0.12	1.38	0.73	0.02	0.01	2.27	0.15	38.93
Sum of CO	2008	97.13	4.00	0.30	7.37	42.73	0.84	7.74	35.23	2.37	197.71
	2012	221.10	6.53	0.41	3.61	11.31	0.68	5.54	37.61	2.73	289.52
	2014	487.63	9.93	1.14	8.40	15.36	0.55	4.17	38.60	3.03	568.81
	2018	31.90	21.90	2.30	8.95	19.11	0.83	4.37	45.12	2.82	137.29
	2023	67.78	16.82	2.32	18.30	6.82	0.84	3.45	67.95	3.44	187.73
	2030	59.00	35.01	2.49	20.33	7.30	0.72	2.85	71.16	3.42	202.30
	2036	73.97	35.01	2.64	20.43	7.35	0.64	2.59	67.27	3.38	213.29
	2045	76.55	35.01	2.34	20.43	8.37	0.60	2.57	61.92	3.38	211.17
Sum of PM25	2008	0.95	3.20	0.04	0.60	5.30	0.00	0.05	6.45	0.42	17.02
	2012	1.46	1.13	0.02	0.09	2.27	0.00	0.05	5.47	0.35	10.84
	2014	1.32	2.69	0.07	0.09	2.48	0.00	0.05	4.72	0.33	11.76
	2018	0.36	3.82	0.02	0.11	3.39	0.00	0.09	4.65	0.25	12.69
	2023	0.65	3.51	0.02	0.06	2.19	0.00	0.11	5.16	0.24	11.95
	2030	0.53	5.16	0.02	0.06	2.32	0.00	0.12	3.43	0.16	11.80
	2036	0.71	5.16	0.03	0.06	2.26	0.00	0.11	1.99	0.10	10.42
	2045	0.73	5.16	0.02	0.06	2.11	0.00	0.12	0.94	0.05	9.20
Sum of PM10	2008	1.01	4.00	0.05	0.64	6.05	0.00	0.12	7.04	0.45	19.35
	2012	1.52	1.22	0.03	0.12	3.25	0.00	0.12	5.90	0.38	12.55
	2014	1.33	2.95	0.08	0.15	4.53	0.00	0.12	5.07	0.35	14.58
	2018	0.39	4.14	0.02	0.17	5.32	0.01	0.21	5.04	0.27	15.56
	2023	0.71	3.80	0.02	0.13	4.48	0.01	0.27	5.54	0.26	15.21
	2030	0.57	5.59	0.02	0.14	4.83	0.01	0.29	3.61	0.16	15.22
	2036	0.77	5.59	0.03	0.14	4.80	0.01	0.28	2.05	0.10	13.77
	2045	0.80	5.59	0.02	0.14	4.66	0.01	0.29	0.94	0.05	12.50
Sum of PM10TW	2008				0.01	0.30	0.00	0.02			0.33
	2012				0.01	0.52	0.00	0.02			0.56
	2014	0.00	0.00	0.00	0.03	1.15	0.00	0.02	0.00	0.00	1.20
	2018				0.03	1.05	0.00	0.04			1.12
	2023	0.00	0.00	0.00	0.04	1.30	0.00	0.05	0.00	0.00	1.39
	2030	0.00	0.00	0.00	0.04	1.43	0.00	0.05	0.00	0.00	1.52
	2036	0.00	0.00	0.00	0.04	1.45	0.00	0.05	0.00	0.00	1.54
	2045	0.00	0.00	0.00	0.04	1.46	0.00	0.05	0.00	0.00	1.55
Sum of PM10BW	2008				0.02	0.52	0.00	0.09			0.62
	2012				0.02	0.90	0.00	0.09			1.02
	2014	0.00	0.00	0.00	0.06	1.97	0.00	0.09	0.00	0.00	2.12
	2018				0.05	1.81	0.01	0.16			2.03
	2023	0.00	0.00	0.00	0.07	2.23	0.01	0.21	0.00	0.00	2.51
	2030	0.00	0.00	0.00	0.08	2.45	0.01	0.23	0.00	0.00	2.76
	2036	0.00	0.00	0.00	0.08	2.49	0.01	0.23	0.00	0.00	2.80
	2045	0.00	0.00	0.00	0.08	2.50	0.01	0.23	0.00	0.00	2.81
Sum of SOx	2008	0.03	43.14	0.00	0.01	0.15	0.00	0.01	0.14	0.01	43.49
	2012	0.06	4.95	0.00	0.02	0.25	0.00	0.01	0.15	0.01	5.45
	2014	0.11	7.02	0.00	0.04	0.54	0.00	0.01	0.15	0.01	7.88
	2018	0.25	9.54	0.00	0.04	0.49	0.00	0.01	0.18	0.01	10.53
	2023	0.15	8.45	0.00	0.05	0.58	0.00	0.01	0.26	0.01	9.52
	2030	0.16	8.55	0.00	0.05	0.53	0.00	0.01	0.28	0.01	9.60
	2036	0.16	8.55	0.00	0.04	0.46	0.00	0.01	0.26	0.01	9.51
	2045	0.16	8.55	0.00	0.04	0.40	0.00	0.01	0.24	0.01	9.42
Sum of CO2	2008	7267.02	2602.41	45.21	1294.26	14975.26	48.89	818.11	13597.00	911.57	41559.73
	2012	14068.08	2491.64	53.38	2244.12	25063.94	49.93	830.81	14512.34	1048.07	60362.32
	2014	24303.38	11933.91	147.82	5541.12	53495.69	45.70	774.16	14896.86	1161.31	112299.95
	2018	22992.41	14377.33	290.79	5212.30	48706.91	84.74	1289.95	17408.67	1080.94	111444.04
	2023	35391.18	12727.55	281.10	6377.40	54915.88	94.05	1457.95	26219.68	1323.23	138788.03
	2030	39476.73	12883.51	281.10	6073.99	51823.29	87.05	1338.86	27458.44	1314.66	140737.62
	2036	39501.04	12883.51	281.10	5307.14	45383.67	79.94	1224.13	25956.64	1301.43	131918.60
	2045	39476.33	12883.51	281.10	4594.07	40083.61	78.30	1219.53	23890.20	1301.26	123807.92
Sum of CH4	2008	0.53	0.03	0.00	0.16	0.73	0.02	0.05	1.10	0.07	2.69
	2012	1.19	0.03	0.00	0.05	0.22	0.02	0.03	1.17	0.08	2.80
	2014	2.11	0.13	0.00	0.10	0.36	0.01	0.02	1.21	0.09	4.05
	2018	0.78	0.16	0.01	0.11	0.41	0.02	0.02	1.41	0.09	3.00
	2023	2.20	0.17	0.01	0.06	0.10	0.02	0.01	2.12	0.11	4.79
	2030	2.58	0.17	0.01	0.07	0.07	0.01	0.01	2.22	0.11	5.23
	2036	2.25	0.17	0.01	0.07	0.05	0.01	0.00	2.10	0.10	4.76
	2045	1.38	0.17	0.01	0.07	0.05	0.01	0.00	1.93	0.10	3.72
Sum of N2O	2008	0.00	0.17	0.00	0.08	2.54	0.01	0.05	0.36	0.02	3.24
	2012	0.00	0.16	0.00	0.12	4.39	0.01	0.04	0.38	0.03	5.13
	2014	0.00	0.82	0.01	0.27	9.42	0.01	0.03	0.39	0.03	10.98
	2018	0.00	0.98	0.01	0.25	8.67	0.01	0.03	0.46	0.03	10.44
	2023	0.00	0.84	0.01	0.32	10.28	0.01	0.02	0.69	0.03	12.21
	2030	0.00	0.74	0.01	0.29	9.45	0.01	0.02	0.72	0.03	11.28
	2036	0.00	0.74	0.01	0.25	8.20	0.01	0.02	0.68	0.03	9.94
	2045	0.00	0.74	0.01	0.21	4.41	0.01	0.02	0.63	0.03	6.07
Sum of DPM	2008	0.64	3.11	0.05	0.61	5.23	0.00	0.00	7.04	0.45	17.13
	2012	0.81	1.13	0.03	0.04	0.93	0.00	0.00	5.90	0.38	9.22
	2014	0.12	2.10	0.08	0.02	0.47	0.00	0.00	5.07	0.35	8.20
	2018	0.21	3.22	0.02	0.00	0.12	0.00	0.00	5.04	0.27	8.88
	2023	0.27	3.19	0.02	0.00	0.05	0.00	0.00	5.54	0.26	9.32
	2030	0.18	4.99	0.02	0.00	0.05	0.00	0.00	3.61	0.16	9.02
	2036	0.26	4.99	0.03	0.00	0.04	0.00	0.00	2.05	0.10	7.47
	2045	0.35	4.99	0.02	0.00	0.04	0.00	0.00	0.94	0.05	6.39

Table B1-662. 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**	2008	0.6		0.6
		2012	0.8		0.8
		2014	0.1	0.0	0.1
		2018	0.2		0.2
		2023	0.3	0.0	0.3
		2030	0.2	0.0	0.2
		2036	0.3	0.0	0.3
		2045	0.3	0.0	0.3
	LPG	2008	0.4		0.0
		2012	0.7		0.0
		2014	1.2	0.0	0.0
OGV	**MGO/MDO**	2008	4.0		3.1
		2012	1.2		1.1
		2014	3.0	0.0	2.1
		2018	4.1		3.2
		2023	3.8	0.0	3.2
		2030	5.6	0.0	5.0
		2036	5.6	0.0	5.0
		2045	5.6	0.0	5.0
Harbor Craft	**MGO/MDO**	2008	0.0		0.0
		2012	0.0		0.0
		2014	0.1	0.0	0.1
		2018	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
Onsite Trucks	**Diesel**	2008	0.6	0.9	0.6
		2012	0.1	1.2	0.0
		2014	0.0	2.7	0.0
		2018	0.0	0.0	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	2008	0.0	0.0	0.0
		2012	0.1	0.1	0.0
		2014	0.1	0.2	0.0
		2018	0.2	2.8	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	**LNG+Diesel**	2008	6.0	0.6	5.2
		2012	3.3	1.1	0.9
		2014	4.5	2.4	0.5
		2018	5.3	2.2	0.1
		2023	4.5	2.6	0.0
		2030	4.8	2.9	0.0
		2036	4.8	2.9	0.0
		2045	4.7	2.9	0.0
Onsite PC	**Diesel/Gas/Elec**	2008	0.0	0.0	0.0
		2012	0.0	0.0	0.0
		2014	0.0	0.0	0.0
		2018	0.0	0.1	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**	2008	0.1	0.2	0.0
		2012	0.1	0.2	0.0
		2014	0.1	0.2	0.0
		2018	0.2	0.4	0.0
		2023	0.3	0.4	0.0
		2030	0.3	0.5	0.0
		2036	0.3	0.5	0.0
		2045	0.3	0.5	0.0
Rail Offsite	**Diesel**	2008	7.0		7.0
		2012	5.9		5.9
		2014	5.1	0.0	5.1
		2018	5.0		5.0
		2023	5.5	0.0	5.5
		2030	3.6	0.0	3.6
		2036	2.1	0.0	2.1
		2045	0.9	0.0	0.9
Rail Onsite	**Diesel**	2008	0.5		0.5
		2012	0.4		0.4
		2014	0.4	0.0	0.4
		2018	0.3		0.3
		2023	0.3	0.0	0.3
		2030	0.2	0.0	0.2
		2036	0.1	0.0	0.1
		2045	0.1	0.0	0.1
Grand Total			**116.8**	**44.5**	**75.6**

Table B1-663. FEIR Mitigated Scenario Peakday 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	2008	349.67	1,138.36	40.27	133.70	1,466.46	0.80	6.26	1,703.78	111.75	4,951.05
	2012	457.77	417.27	27.26	124.69	862.76	0.59	3.94	1,409.41	96.32	3,400.01
	2014	771.39	4,452.97	48.56	276.74	1,778.48	0.47	2.88	1,425.72	104.71	8,861.92
	2018	97.53	3,907.77	20.26	274.53	1,744.86	0.64	2.57	1,713.03	98.44	7,859.63
	2023	155.34	5,622.88	19.94	182.88	892.23	0.52	1.54	1,975.64	96.84	8,947.81
	2030	121.23	4,594.11	21.11	207.46	779.95	0.41	1.02	1,435.51	68.85	7,229.66
	2036	138.21	2,991.53	22.12	209.23	719.56	0.36	0.87	928.14	48.43	5,058.45
	2045	140.73	1,287.99	20.04	209.24	790.22	0.36	0.86	502.73	30.84	2,983.01
Sum of VOC	2008	34.55	61.90	2.89	22.96	93.22	1.04	2.03	89.08	5.92	313.60
	2012	102.75	48.82	2.55	7.65	26.58	0.77	1.23	69.60	4.79	264.73
	2014	244.51	218.44	4.56	15.36	44.96	0.62	0.89	62.53	4.69	596.56
	2018	42.31	289.08	2.28	15.98	52.12	0.78	0.72	65.02	3.91	472.21
	2023	119.61	193.20	2.47	10.70	11.89	0.56	0.36	70.78	3.60	413.17
	2030	59.82	371.96	2.74	11.37	8.32	0.36	0.18	49.44	2.50	506.69
	2036	121.76	371.96	2.98	11.23	6.50	0.25	0.12	31.45	1.76	548.00
	2045	130.95	371.96	2.48	11.16	5.93	0.19	0.09	18.42	1.23	542.41
Sum of CO	2008	829.48	70.44	11.47	62.92	364.94	7.17	66.11	300.90	20.23	1733.64
	2012	1765.90	77.72	15.68	28.83	90.35	5.44	44.21	300.35	21.79	2350.28
	2014	4055.11	273.90	26.95	69.87	127.77	4.61	34.66	321.03	25.16	4939.05
	2018	269.63	123.65	47.00	75.66	161.55	7.03	36.95	381.41	23.84	1126.72
	2023	548.89	340.30	49.57	148.21	55.20	6.81	27.98	550.34	27.88	1755.18
	2030	477.85	716.36	53.22	164.65	59.11	5.84	23.11	576.34	27.69	2104.19
	2036	599.09	716.36	56.35	165.45	59.55	5.16	20.96	544.81	27.40	2195.13
	2045	619.96	716.36	50.02	165.45	67.80	4.85	20.78	501.45	27.40	2174.07
Sum of PM25	2008	8.15	86.70	1.60	5.09	45.26	0.02	0.43	55.09	3.56	205.91
	2012	11.63	14.26	0.90	0.72	18.11	0.02	0.40	43.65	2.83	92.53
	2014	10.97	70.68	1.66	0.77	20.66	0.02	0.40	39.28	2.72	147.15
	2018	3.06	38.89	0.45	0.95	28.64	0.03	0.73	39.28	2.10	114.13
	2023	5.28	70.51	0.41	0.46	17.73	0.04	0.89	41.79	1.96	139.06
	2030	4.27	105.93	0.48	0.50	18.81	0.04	0.95	27.75	1.26	159.97
	2036	5.73	105.93	0.54	0.49	18.29	0.04	0.92	16.15	0.79	148.87
	2045	5.95	105.93	0.42	0.49	17.11	0.03	0.93	7.63	0.43	138.92
Sum of PM10	2008	8.59	107.78	1.74	5.45	51.66	0.04	0.99	60.10	3.88	240.24
	2012	12.15	15.35	0.98	0.95	25.99	0.03	0.96	47.15	3.06	106.63
	2014	11.05	77.17	1.80	1.26	37.66	0.03	0.96	42.13	2.91	174.98
	2018	3.33	42.07	0.49	1.43	44.97	0.07	1.76	42.57	2.28	138.96
	2023	5.74	76.32	0.45	1.02	36.25	0.08	2.16	44.84	2.10	168.96
	2030	4.64	114.70	0.52	1.12	39.12	0.08	2.33	29.22	1.32	193.05
	2036	6.23	114.70	0.59	1.11	38.90	0.08	2.28	16.61	0.81	181.31
	2045	6.46	114.70	0.45	1.11	37.75	0.08	2.32	7.64	0.43	170.94
Sum of PM10TW	2008				0.08	2.58	0.00	0.16			2.83
	2012				0.12	4.19	0.00	0.16			4.48
	2014	0.00	0.00	0.00	0.27	9.53	0.00	0.17	0.00	0.00	9.97
	2018				0.26	8.92	0.01	0.30			9.49
	2023	0.00	0.00	0.00	0.32	10.51	0.01	0.38	0.00	0.00	11.22
	2030	0.00	0.00	0.00	0.36	11.55	0.01	0.41	0.00	0.00	12.32
	2036	0.00	0.00	0.00	0.36	11.74	0.01	0.40	0.00	0.00	12.51
	2045	0.00	0.00	0.00	0.36	11.79	0.01	0.41	0.00	0.00	12.57
Sum of PM10BW	2008				0.14	4.42	0.02	0.75			5.34
	2012				0.20	7.19	0.02	0.75			8.16
	2014	0.00	0.00	0.00	0.47	16.34	0.02	0.76	0.00	0.00	17.60
	2018				0.45	15.29	0.05	1.39			17.18
	2023	0.00	0.00	0.00	0.55	18.03	0.06	1.72	0.00	0.00	20.36
	2030	0.00	0.00	0.00	0.61	19.80	0.06	1.87	0.00	0.00	22.35
	2036	0.00	0.00	0.00	0.61	20.13	0.06	1.85	0.00	0.00	22.65
	2045	0.00	0.00	0.00	0.61	20.21	0.06	1.88	0.00	0.00	22.77
Sum of SOx	2008	0.28	1154.16	0.02	0.08	1.27	0.00	0.07	1.17	0.08	1157.14
	2012	0.49	82.40	0.02	0.14	2.02	0.00	0.07	1.17	0.08	86.38
	2014	0.89	143.22	0.04	0.37	4.46	0.00	0.06	1.25	0.10	150.39
	2018	2.10	98.93	0.06	0.35	4.16	0.01	0.11	1.49	0.09	107.29
	2023	1.19	164.98	0.06	0.38	4.67	0.01	0.12	2.14	0.11	173.67
	2030	1.33	170.01	0.06	0.38	4.30	0.01	0.11	2.25	0.11	178.54
	2036	1.33	170.01	0.06	0.33	3.74	0.01	0.10	2.12	0.11	177.82
	2045	1.33	170.01	0.06	0.29	3.22	0.01	0.10	1.95	0.11	177.08
Sum of CO2	2008	62061.03	73496.74	1727.46	11052.99	127890.05	417.55	6986.72	116119.66	7784.91	407537.12
	2012	112357.55	37700.85	2057.40	17922.93	200178.19	398.80	6635.45	115905.70	8370.60	501527.47
	2014	202106.61	273158.61	3484.09	46079.50	444869.51	380.07	6437.90	123882.15	9657.47	1110055.90
	2018	194364.08	148869.00	5953.72	44061.26	411739.09	716.31	10904.47	147162.48	9137.63	972908.04
	2023	286622.33	248313.50	6004.67	51648.23	444746.93	761.72	11807.49	212345.16	10716.45	1272966.48
	2030	319709.92	255881.61	6004.67	49190.99	419700.93	705.01	10843.01	222377.46	10647.02	1295060.62
	2036	319906.81	255881.61	6004.67	42980.52	367548.42	647.44	9913.84	210214.91	10539.86	1223638.10
	2045	319706.67	255881.61	6004.67	37205.67	324624.92	634.12	9876.62	193479.44	10538.51	1157952.24
Sum of CH4	2008	4.52	0.58	0.04	1.39	6.26	0.19	0.39	9.40	0.63	23.40
	2012	9.52	0.22	0.04	0.44	1.79	0.15	0.25	9.38	0.67	22.45
	2014	17.56	4.15	0.07	0.86	3.02	0.12	0.18	10.03	0.77	36.77
	2018	6.59	1.57	0.12	0.91	3.50	0.16	0.17	11.91	0.73	25.66
	2023	17.78	3.33	0.12	0.52	0.80	0.13	0.10	17.19	0.86	40.83
	2030	20.89	3.40	0.12	0.54	0.56	0.09	0.05	18.00	0.86	44.52
	2036	18.20	3.40	0.12	0.53	0.44	0.07	0.04	17.01	0.85	40.66
	2045	11.18	3.40	0.12	0.53	0.40	0.05	0.03	15.66	0.85	32.22
Sum of N2O	2008	0.00	4.47	0.08	0.67	21.73	0.06	0.42	3.06	0.20	30.68
	2012	0.00	2.66	0.09	0.97	35.05	0.05	0.28	3.05	0.22	42.38
	2014	0.00	17.43	0.16	2.25	78.35	0.04	0.22	3.26	0.25	101.96
	2018	0.00	10.51	0.27	2.15	73.30	0.07	0.24	3.87	0.24	90.66
	2023	0.00	15.96	0.27	2.55	83.29	0.07	0.19	5.59	0.28	108.21
	2030	0.00	14.24	0.27	2.37	76.49	0.06	0.16	5.85	0.28	99.72
	2036	0.00	14.24	0.27	2.03	66.37	0.06	0.14	5.53	0.28	88.92
	2045	0.00	14.24	0.27	1.74	57.12	0.06	0.15	5.09	0.28	78.94
Sum of DPM	2008	5.47	82.81	1.74	5.24	44.65	0.00	0.00	60.10	3.88	203.89
	2012	6.45	13.63	0.98	0.32	7.41	0.00	0.00	47.15	3.06	79.01
	2014	0.98	63.20	1.80	0.17	3.95	0.00	0.00	42.13	2.91	115.15
	2018	1.75	31.89	0.49	0.04	1.04	0.00	0.00	42.57	2.28	80.06
	2023	2.18	65.99	0.45	0.01	0.39	0.00	0.00	44.84	2.10	115.94
	2030	1.47	104.66	0.52	0.01	0.39	0.00	0.00	29.22	1.32	137.59
	2036	2.11	104.66	0.59	0.01	0.35	0.00	0.00	16.61	0.81	125.14
	2045	2.82	104.66	0.45	0.01	0.29	0.00	0.00	7.64	0.43	116.30

Table B1-664. Peakday FEIR Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/day

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	**Diesel**	2008	5.5		5.5
		2012	6.4		6.4
		2014	1.0	0.0	1.0
		2018	1.8		1.8
		2023	2.2	0.0	2.2
		2030	1.5	0.0	1.5
		2036	2.1	0.0	2.1
		2045	2.8	0.0	2.8
	LPG	2008	3.1		0.0
		2012	5.7		0.0
		2014	10.1	0.0	0.0
OGV	**MDO/MGO**	2008	107.8		82.8
		2012	15.4		13.6
		2014	77.2	0.0	63.2
		2018	42.1		31.9
		2023	76.3	0.0	66.0
		2030	114.7	0.0	104.7
		2036	114.7	0.0	104.7
		2045	114.7	0.0	104.7
Harbor Craft	**MDO/MGO**	2008	1.7		1.7
		2012	1.0		1.0
		2014	1.8	0.0	1.8
		2018	0.5		0.5
		2023	0.4	0.0	0.4
		2030	0.5	0.0	0.5
		2036	0.6	0.0	0.6
		2045	0.5	0.0	0.5
Onsite Trucks	**Diesel**	2008	5.5	7.3	5.2
		2012	0.5	9.5	0.3
		2014	0.4	22.7	0.2
		2018	0.0	0.0	0.0
		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	2008	0.0	0.0	0.0
		2012	0.5	1.1	0.0
		2014	0.9	2.0	0.0
		2018	1.4	23.8	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	**LNG+Diesel**	2008	51.7	5.3	44.7
		2012	26.0	8.5	7.4
		2014	37.7	20.0	3.9
		2018	45.0	18.5	1.0
		2023	36.3	20.9	0.4
		2030	39.1	23.1	0.4
		2036	38.9	23.7	0.4
		2045	37.8	23.6	0.3
Onsite PC	**Diesel/Gas/Elec**	2008	0.0	0.2	0.0
		2012	0.0	0.2	0.0
		2014	0.0	0.2	0.0
		2018	0.1	0.5	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**	2008	1.0	1.6	0.0
		2012	1.0	1.6	0.0
		2014	1.0	1.7	0.0
		2018	1.8	3.0	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**	2008	60.1		60.1
		2012	47.2		47.2
		2014	42.1	0.0	42.1
		2018	42.6		42.6
		2023	44.8	0.0	44.8
		2030	29.2	0.0	29.2
		2036	16.6	0.0	16.6
		2045	7.6	0.0	7.6
Rail Onsite	**Diesel**	2008	3.9		3.9
		2012	3.1		3.1
		2014	2.9	0.0	2.9
		2018	2.3		2.3
		2023	2.1	0.0	2.1
		2030	1.3	0.0	1.3
		2036	0.8	0.0	0.8
		2045	0.4	0.0	0.4
Grand Total			**1359.0**	**363.9**	**973.1**

Table B1-665. FEIR Mitigated Scenario Peak 8hr 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	2008	216.58	645.31	40.27	82.81	908.30	0.50	3.88	567.93	37.25	2,502.83
	2012	225.07	378.68	27.26	61.31	424.20	0.29	1.94	469.80	32.11	1,620.66
	2014	377.69	3,471.28	7.71	135.50	870.79	0.23	1.41	475.24	34.90	5,374.74
	2018	48.09	2,747.39	11.07	135.37	860.38	0.32	1.27	571.01	32.81	4,407.71
	2023	82.29	1,802.74	7.17	96.88	472.63	0.27	0.82	658.55	32.28	3,153.62
	2030	64.22	1,634.52	6.08	109.89	413.15	0.21	0.54	478.50	22.95	2,730.08
	2036	73.21	947.69	6.37	110.84	381.16	0.19	0.46	309.38	16.14	1,845.45
	2045	74.55	519.11	5.77	110.84	418.59	0.19	0.46	167.58	10.28	1,307.36
Sum of VOC	2008	21.40	44.98	2.89	14.22	57.74	0.65	1.26	29.69	1.97	174.81
	2012	50.52	40.94	2.55	3.76	13.07	0.38	0.60	23.20	1.60	136.62
	2014	119.72	173.39	0.84	7.52	22.01	0.30	0.44	20.84	1.56	346.63
	2018	20.86	215.19	1.25	7.88	25.70	0.38	0.35	21.67	1.30	294.60
	2023	63.36	54.67	0.89	5.67	6.30	0.30	0.19	23.59	1.20	156.17
	2030	31.69	161.06	0.79	6.02	4.41	0.19	0.10	16.48	0.83	221.57
	2036	64.50	161.06	0.86	5.95	3.44	0.13	0.06	10.48	0.59	247.08
	2045	69.37	161.06	0.72	5.91	3.14	0.10	0.05	6.14	0.41	246.90
Sum of CO	2008	513.77	29.09	11.47	38.97	226.04	4.44	40.95	100.30	6.74	971.77
	2012	868.26	60.55	15.68	14.18	44.42	2.68	21.74	100.12	7.26	1134.88
	2014	1985.48	189.53	4.94	34.21	62.56	2.26	16.97	107.01	8.39	2411.34
	2018	132.95	70.82	25.68	37.31	79.66	3.47	18.22	127.14	7.95	503.19
	2023	290.76	85.54	17.83	78.51	29.24	3.61	14.82	183.45	9.29	713.05
	2030	253.13	293.64	15.33	87.22	31.31	3.10	12.24	192.11	9.23	897.31
	2036	317.35	293.64	16.23	87.64	31.54	2.73	11.10	181.60	9.13	950.97
	2045	328.40	293.64	14.40	87.64	35.91	2.57	11.01	167.15	9.13	949.87
Sum of PM25	2008	5.05	36.83	1.60	3.15	28.03	0.01	0.27	18.36	1.19	94.51
	2012	5.72	11.08	0.90	0.36	8.90	0.01	0.20	14.55	0.94	42.67
	2014	5.37	48.62	0.25	0.38	10.12	0.01	0.20	13.09	0.91	78.93
	2018	1.51	22.15	0.25	0.47	14.12	0.02	0.36	13.09	0.70	52.66
	2023	2.80	21.96	0.15	0.24	9.39	0.02	0.47	13.93	0.65	49.61
	2030	2.26	44.17	0.14	0.26	9.96	0.02	0.50	9.25	0.42	66.99
	2036	3.03	44.17	0.16	0.26	9.69	0.02	0.49	5.38	0.26	63.46
	2045	3.15	44.17	0.12	0.26	9.06	0.02	0.49	2.54	0.14	59.96
Sum of PM10	2008	5.32	45.82	1.74	3.38	32.00	0.02	0.61	20.03	1.29	110.22
	2012	5.97	11.99	0.98	0.47	12.78	0.02	0.47	15.72	1.02	49.41
	2014	5.41	52.87	0.27	0.62	18.44	0.02	0.47	14.04	0.97	93.10
	2018	1.64	23.97	0.27	0.70	22.17	0.03	0.87	14.19	0.76	64.61
	2023	3.04	23.76	0.16	0.54	19.20	0.04	1.14	14.95	0.70	63.54
	2030	2.46	47.83	0.15	0.59	20.72	0.04	1.23	9.74	0.44	83.21
	2036	3.30	47.83	0.17	0.59	20.60	0.04	1.21	5.54	0.27	79.55
	2045	3.42	47.83	0.13	0.59	20.00	0.04	1.23	2.55	0.14	75.93
Sum of PM10TW	2008				0.05	1.60	0.00	0.10			1.75
	2012				0.06	2.06	0.00	0.08			2.20
	2014	0.00	0.00	0.00	0.13	4.67	0.00	0.08	0.00	0.00	4.88
	2018				0.13	4.40	0.01	0.15			4.68
	2023	0.00	0.00	0.00	0.17	5.57	0.01	0.20	0.00	0.00	5.94
	2030	0.00	0.00	0.00	0.19	6.12	0.01	0.22	0.00	0.00	6.53
	2036	0.00	0.00	0.00	0.19	6.22	0.01	0.21	0.00	0.00	6.63
	2045	0.00	0.00	0.00	0.19	6.24	0.01	0.22	0.00	0.00	6.66
Sum of PM10BW	2008				0.08	2.74	0.01	0.47			3.30
	2012				0.10	3.53	0.01	0.37			4.01
	2014	0.00	0.00	0.00	0.23	8.00	0.01	0.37	0.00	0.00	8.62
	2018				0.22	7.54	0.02	0.69			8.47
	2023	0.00	0.00	0.00	0.29	9.55	0.03	0.91	0.00	0.00	10.78
	2030	0.00	0.00	0.00	0.32	10.49	0.03	0.99	0.00	0.00	11.84
	2036	0.00	0.00	0.00	0.32	10.66	0.03	0.98	0.00	0.00	12.00
	2045	0.00	0.00	0.00	0.32	10.71	0.03	1.00	0.00	0.00	12.06
Sum of SOx	2008	0.17	444.49	0.02	0.05	0.79	0.00	0.04	0.39	0.03	445.98
	2012	0.24	43.55	0.02	0.07	0.99	0.00	0.03	0.39	0.03	45.33
	2014	0.44	101.25	0.01	0.18	2.19	0.00	0.03	0.42	0.03	104.54
	2018	1.04	49.95	0.03	0.17	2.05	0.00	0.05	0.50	0.03	53.83
	2023	0.63	56.67	0.02	0.20	2.47	0.00	0.06	0.71	0.04	60.82
	2030	0.70	68.83	0.02	0.20	2.28	0.00	0.06	0.75	0.04	72.88
	2036	0.70	68.83	0.02	0.18	1.98	0.00	0.05	0.71	0.04	72.51
	2045	0.70	68.83	0.02	0.15	1.71	0.00	0.05	0.65	0.04	72.16
Sum of CO2	2008	38439.76	28299.68	1727.46	6846.07	79213.36	258.63	4327.48	38706.55	2594.97	200413.96
	2012	55243.88	19915.10	2057.40	8812.33	98423.47	196.08	3262.51	38635.23	2790.20	229336.21
	2014	98956.03	171576.32	626.34	22561.58	217818.32	186.09	3152.15	41294.05	3219.16	559390.04
	2018	95839.69	75156.85	3252.70	21726.33	203025.92	353.21	5376.92	49054.16	3045.88	456831.66
	2023	151828.63	85196.35	2160.02	27358.93	235589.87	403.49	6254.62	70781.72	3572.15	583145.80
	2030	169355.68	103487.14	1729.30	26057.29	222322.59	373.46	5743.72	74125.82	3549.01	606744.00
	2036	169459.98	103487.14	1729.30	22767.50	194696.53	342.96	5251.53	70071.64	3513.29	571319.86
	2045	169353.96	103487.14	1729.30	19708.46	171959.24	335.90	5231.81	64493.15	3512.84	539811.80
Sum of CH4	2008	2.80	0.26	0.04	0.86	3.88	0.12	0.24	3.13	0.21	11.54
	2012	4.68	0.18	0.04	0.22	0.88	0.07	0.12	3.13	0.22	9.54
	2014	8.60	3.29	0.01	0.42	1.48	0.06	0.09	3.34	0.26	17.56
	2018	3.25	1.00	0.07	0.45	1.73	0.08	0.08	3.97	0.24	10.87
	2023	9.42	1.02	0.04	0.28	0.42	0.07	0.05	5.73	0.29	17.32
	2030	11.06	1.31	0.04	0.29	0.30	0.05	0.03	6.00	0.29	19.35
	2036	9.64	1.31	0.04	0.28	0.23	0.03	0.02	5.67	0.28	17.51
	2045	5.92	1.31	0.04	0.28	0.21	0.03	0.02	5.22	0.28	13.30
Sum of N2O	2008	0.00	1.73	0.08	0.42	13.46	0.04	0.26	1.02	0.07	17.07
	2012	0.00	1.21	0.09	0.48	17.23	0.02	0.14	1.02	0.07	20.27
	2014	0.00	10.71	0.03	1.10	38.36	0.02	0.11	1.09	0.08	51.50
	2018	0.00	5.33	0.15	1.06	36.14	0.04	0.12	1.29	0.08	44.21
	2023	0.00	5.60	0.10	1.35	44.12	0.04	0.10	1.86	0.09	53.27
	2030	0.00	5.68	0.08	1.26	40.52	0.03	0.08	1.95	0.09	49.70
	2036	0.00	5.68	0.08	1.08	35.16	0.03	0.08	1.84	0.09	44.04
	2045	0.00	5.68	0.08	0.92	30.26	0.03	0.08	1.70	0.09	38.84
Sum of DPM	2008	3.39	37.49	1.74	3.24	27.66	0.00	0.00	20.03	1.29	94.85
	2012	3.17	11.41	0.98	0.16	3.65	0.00	0.00	15.72	1.02	36.10
	2014	0.48	46.95	0.27	0.09	1.93	0.00	0.00	14.04	0.97	64.74
	2018	0.86	20.29	0.27	0.02	0.51	0.00	0.00	14.19	0.76	36.90
	2023	1.15	19.62	0.16	0.00	0.20	0.00	0.00	14.95	0.70	36.79
	2030	0.78	43.83	0.15	0.00	0.21	0.00	0.00	9.74	0.44	55.16
	2036	1.12	43.83	0.17	0.00	0.19	0.00	0.00	5.54	0.27	51.12
	2045	1.50	43.83	0.13	0.00	0.15	0.00	0.00	2.55	0.14	48.31

Table B1-666. Peak 8hr 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	2008	3.4		3.4
		2012	3.2		3.2
		2014	0.5	0.0	0.5
		2018	0.9		0.9
		2023	1.2	0.0	1.2
		2030	0.8	0.0	0.8
		2036	1.1	0.0	1.1
		2045	1.5	0.0	1.5
	LPG	2008	1.9		0.0
		2012	2.8		0.0
		2014	4.9	0.0	0.0
OGV	MDO/MGO	2008	45.8		37.5
		2012	12.0		11.4
		2014	52.9	0.0	47.0
		2018	24.0		20.3
		2023	23.8	0.0	19.6
		2030	47.8	0.0	43.8
		2036	47.8	0.0	43.8
		2045	47.8	0.0	43.8
Harbor Craft	MDO/MGO	2008	1.7		1.7
		2012	1.0		1.0
		2014	0.3	0.0	0.3
		2018	0.3		0.3
		2023	0.2	0.0	0.2
		2030	0.1	0.0	0.1
		2036	0.2	0.0	0.2
		2045	0.1	0.0	0.1
Onsite Trucks	Diesel	2008	3.4	4.5	3.2
		2012	0.2	4.7	0.2
		2014	0.2	11.1	0.1
		2018	0.0	0.0	0.0
		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	2008	0.0	0.0	0.0
		2012	0.2	0.5	0.0
		2014	0.4	1.0	0.0
		2018	0.7	11.7	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	LNG+Diesel	2008	32.0	3.3	27.7
		2012	12.8	4.2	3.6
		2014	18.4	9.8	1.9
		2018	22.2	9.1	0.5
		2023	19.2	11.1	0.2
		2030	20.7	12.3	0.2
		2036	20.6	12.6	0.2
		2045	20.0	12.5	0.2
Onsite PC	Diesel/Gas/Elec	2008	0.0	0.2	0.0
		2012	0.0	0.1	0.0
		2014	0.0	0.1	0.0
		2018	0.0	0.2	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	2008	0.6	1.0	0.0
		2012	0.5	0.8	0.0
		2014	0.5	0.8	0.0
		2018	0.9	1.5	0.0
		2023	1.1	1.8	0.0
		2030	1.2	2.0	0.0
		2036	1.2	2.0	0.0
		2045	1.2	2.0	0.0
Rail Offsite	Diesel	2008	20.0		20.0
		2012	15.7		15.7
		2014	14.0	0.0	14.0
		2018	14.2		14.2
		2023	14.9	0.0	14.9
		2030	9.7	0.0	9.7
		2036	5.5	0.0	5.5
		2045	2.5	0.0	2.5
Rail Onsite	Diesel	2008	1.3		1.3
		2012	1.0		1.0
		2014	1.0	0.0	1.0
		2018	0.8		0.8
		2023	0.7	0.0	0.7
		2030	0.4	0.0	0.4
		2036	0.3	0.0	0.3
		2045	0.1	0.0	0.1
Grand Total			**611.1**	**189.7**	**424.0**

Table B1-667. FEIR Mitigated Scenario Peak hour 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	2008	30.98	30.82	40.27	11.85	129.93	0.07	0.55	70.99	4.66	320.11
	2012	32.16	30.38	27.26	8.76	60.62	0.04	0.28	58.73	4.01	222.24
	2014	54.31	542.39	7.71	19.49	125.22	0.03	0.20	59.40	4.36	813.12
	2018	6.91	414.20	0.00	19.46	123.66	0.05	0.18	71.38	4.10	639.93
	2023	11.45	93.87	0.00	13.48	65.74	0.04	0.11	82.32	4.04	271.04
	2030	8.93	151.51	2.36	15.29	57.47	0.03	0.08	59.81	2.87	298.35
	2036	10.18	86.39	2.47	15.42	53.02	0.03	0.06	38.67	2.02	208.26
	2045	10.37	50.60	2.24	15.42	58.23	0.03	0.06	20.95	1.29	159.17
Sum of VOC	2008	3.06	1.06	2.89	2.03	8.26	0.09	0.18	3.71	0.25	21.54
	2012	7.22	1.46	2.55	0.54	1.87	0.05	0.09	2.90	0.20	16.87
	2014	17.22	28.32	0.84	1.08	3.17	0.04	0.06	2.61	0.20	53.53
	2018	3.00	27.08	0.00	1.13	3.69	0.06	0.05	2.71	0.16	37.88
	2023	8.81	3.50	0.00	0.79	0.88	0.04	0.03	2.95	0.15	17.15
	2030	4.41	20.10	0.31	0.84	0.61	0.03	0.01	2.06	0.10	28.47
	2036	8.97	20.10	0.33	0.83	0.48	0.02	0.01	1.31	0.07	32.12
	2045	9.65	20.10	0.28	0.82	0.44	0.01	0.01	0.77	0.05	32.12
Sum of CO	2008	73.49	2.58	11.47	5.57	32.33	0.64	5.86	12.54	0.84	145.32
	2012	124.08	3.33	15.68	2.03	6.35	0.38	3.11	12.51	0.91	168.38
	2014	285.52	27.66	4.94	4.92	9.00	0.32	2.44	13.38	1.05	349.22
	2018	19.11	11.00	0.00	5.36	11.45	0.50	2.62	15.89	0.99	66.92
	2023	40.45	8.87	0.00	10.92	4.07	0.50	2.06	22.93	1.16	90.96
	2030	35.21	29.19	5.94	12.13	4.36	0.43	1.70	24.01	1.15	114.13
	2036	44.14	29.19	6.29	12.19	4.39	0.38	1.54	22.70	1.14	121.97
	2045	45.68	29.19	5.58	12.19	5.00	0.36	1.53	20.89	1.14	121.57
Sum of PM25	2008	0.72	3.12	1.60	0.45	4.01	0.00	0.04	2.30	0.15	12.39
	2012	0.82	0.89	0.90	0.05	1.27	0.00	0.03	1.82	0.12	5.90
	2014	0.77	6.78	0.25	0.05	1.45	0.00	0.03	1.64	0.11	11.09
	2018	0.22	3.37	0.00	0.07	2.03	0.00	0.05	1.64	0.09	7.46
	2023	0.39	2.25	0.00	0.03	1.31	0.00	0.07	1.74	0.08	5.87
	2030	0.31	4.78	0.05	0.04	1.39	0.00	0.07	1.16	0.05	7.85
	2036	0.42	4.78	0.06	0.04	1.35	0.00	0.07	0.67	0.03	7.42
	2045	0.44	4.78	0.05	0.04	1.26	0.00	0.07	0.32	0.02	6.97
Sum of PM10	2008	0.76	3.87	1.74	0.48	4.58	0.00	0.09	2.50	0.16	14.19
	2012	0.85	0.96	0.98	0.07	1.83	0.00	0.07	1.96	0.13	6.85
	2014	0.78	7.37	0.27	0.09	2.65	0.00	0.07	1.76	0.12	13.10
	2018	0.24	3.65	0.00	0.10	3.19	0.00	0.12	1.77	0.09	9.17
	2023	0.42	2.44	0.00	0.08	2.67	0.01	0.16	1.87	0.09	7.73
	2030	0.34	5.18	0.06	0.08	2.88	0.01	0.17	1.22	0.06	9.99
	2036	0.46	5.18	0.07	0.08	2.87	0.01	0.17	0.69	0.03	9.55
	2045	0.48	5.18	0.05	0.08	2.78	0.01	0.17	0.32	0.02	9.08
Sum of PM10TW	2008				0.01	0.23	0.00	0.01			0.25
	2012				0.01	0.29	0.00	0.01			0.31
	2014	0.00	0.00	0.00	0.02	0.67	0.00	0.01	0.00	0.00	0.70
	2018				0.02	0.63	0.00	0.02			0.67
	2023	0.00	0.00	0.00	0.02	0.77	0.00	0.03	0.00	0.00	0.83
	2030	0.00	0.00	0.00	0.03	0.85	0.00	0.03	0.00	0.00	0.91
	2036	0.00	0.00	0.00	0.03	0.86	0.00	0.03	0.00	0.00	0.92
	2045	0.00	0.00	0.00	0.03	0.87	0.00	0.03	0.00	0.00	0.93
Sum of PM10BW	2008				0.01	0.39	0.00	0.07			0.47
	2012				0.01	0.51	0.00	0.05			0.57
	2014	0.00	0.00	0.00	0.03	1.15	0.00	0.05	0.00	0.00	1.24
	2018				0.03	1.08	0.00	0.10			1.22
	2023	0.00	0.00	0.00	0.04	1.33	0.00	0.13	0.00	0.00	1.50
	2030	0.00	0.00	0.00	0.04	1.46	0.00	0.14	0.00	0.00	1.65
	2036	0.00	0.00	0.00	0.05	1.48	0.00	0.14	0.00	0.00	1.67
	2045	0.00	0.00	0.00	0.05	1.49	0.00	0.14	0.00	0.00	1.68
Sum of SOx	2008	0.03	44.35	0.02	0.01	0.11	0.00	0.01	0.05	0.00	44.58
	2012	0.03	5.88	0.02	0.01	0.14	0.00	0.00	0.05	0.00	6.15
	2014	0.06	13.82	0.01	0.03	0.31	0.00	0.00	0.05	0.00	14.29
	2018	0.15	8.11	0.00	0.02	0.30	0.00	0.01	0.06	0.00	8.65
	2023	0.09	5.65	0.00	0.03	0.34	0.00	0.01	0.09	0.00	6.22
	2030	0.10	6.87	0.01	0.03	0.32	0.00	0.01	0.09	0.00	7.43
	2036	0.10	6.87	0.01	0.02	0.28	0.00	0.01	0.09	0.00	7.38
	2045	0.10	6.87	0.01	0.02	0.24	0.00	0.01	0.08	0.00	7.33
Sum of CO2	2008	5498.58	2824.82	1727.46	979.29	11330.99	36.99	619.02	4838.32	324.37	28179.83
	2012	7894.78	2684.38	2057.40	1259.35	14065.47	28.02	466.24	4829.40	348.78	33633.82
	2014	14230.38	23184.11	626.34	3244.47	31323.38	26.76	453.29	5161.76	402.39	78652.88
	2018	13774.58	12200.62	0.00	3122.62	29179.93	50.77	772.80	6131.77	380.73	65613.82
	2023	21119.81	8475.65	0.00	3805.71	32771.25	56.13	870.04	8847.72	446.52	76392.83
	2030	23557.88	10303.92	670.02	3624.65	30925.73	51.95	798.97	9265.73	443.63	79642.47
	2036	23572.39	10303.92	670.02	3167.03	27082.87	47.71	730.50	8758.95	439.16	74772.55
	2045	23557.64	10303.92	670.02	2741.51	23920.04	46.73	727.76	8061.64	439.10	70468.36
Sum of CH4	2008	0.40	0.02	0.04	0.12	0.55	0.02	0.03	0.39	0.03	1.61
	2012	0.67	0.02	0.04	0.03	0.13	0.01	0.02	0.39	0.03	1.33
	2014	1.24	0.54	0.01	0.06	0.21	0.01	0.01	0.42	0.03	2.53
	2018	0.47	0.17	0.00	0.06	0.25	0.01	0.01	0.50	0.03	1.50
	2023	1.31	0.07	0.00	0.04	0.06	0.01	0.01	0.72	0.04	2.24
	2030	1.54	0.10	0.01	0.04	0.04	0.01	0.00	0.75	0.04	2.53
	2036	1.34	0.10	0.01	0.04	0.03	0.00	0.00	0.71	0.04	2.28
	2045	0.82	0.10	0.01	0.04	0.03	0.00	0.00	0.65	0.04	1.70
Sum of N2O	2008	0.00	0.17	0.08	0.06	1.92	0.01	0.04	0.13	0.01	2.41
	2012	0.00	0.16	0.09	0.07	2.46	0.00	0.02	0.13	0.01	2.94
	2014	0.00	1.55	0.03	0.16	5.52	0.00	0.02	0.14	0.01	7.42
	2018	0.00	0.85	0.00	0.15	5.19	0.01	0.02	0.16	0.01	6.40
	2023	0.00	0.49	0.00	0.19	6.14	0.01	0.01	0.23	0.01	7.08
	2030	0.00	0.57	0.03	0.17	5.64	0.00	0.01	0.24	0.01	6.69
	2036	0.00	0.57	0.03	0.15	4.89	0.00	0.01	0.23	0.01	5.90
	2045	0.00	0.57	0.03	0.13	4.21	0.00	0.01	0.21	0.01	5.18
Sum of DPM	2008	0.48	2.83	1.74	0.46	3.96	0.00	0.00	2.50	0.16	12.15
	2012	0.45	0.89	0.98	0.02	0.52	0.00	0.00	1.96	0.13	4.96
	2014	0.07	6.66	0.27	0.01	0.28	0.00	0.00	1.76	0.12	9.17
	2018	0.12	3.15	0.00	0.00	0.07	0.00	0.00	1.77	0.09	5.22
	2023	0.16	1.92	0.00	0.00	0.03	0.00	0.00	1.87	0.09	4.07
	2030	0.11	4.68	0.06	0.00	0.03	0.00	0.00	1.22	0.06	6.14
	2036	0.16	4.68	0.07	0.00	0.03	0.00	0.00	0.69	0.03	5.65
	2045	0.21	4.68	0.05	0.00	0.02	0.00	0.00	0.32	0.02	5.29

Table B1-668. Peak hour FEIR Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/hr

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	**Diesel**	2008	0.5		0.5
		2012	0.5		0.5
		2014	0.1	0.0	0.1
		2018	0.1		0.1
		2023	0.2	0.0	0.2
		2030	0.1	0.0	0.1
		2036	0.2	0.0	0.2
		2045	0.2	0.0	0.2
	LPG	2008	0.3		0.0
		2012	0.4		0.0
		2014	0.7	0.0	0.0
OGV	**MDO/MGO**	2008	3.9		2.8
		2012	1.0		0.9
		2014	7.4	0.0	6.7
		2018	3.6		3.1
		2023	2.4	0.0	1.9
		2030	5.2	0.0	4.7
		2036	5.2	0.0	4.7
		2045	5.2	0.0	4.7
Harbor Craft	**MDO/MGO**	2008	1.7		1.7
		2012	1.0		1.0
		2014	0.3	0.0	0.3
		2018	0.0		0.0
		2023	0.0	0.0	0.0
		2030	0.1	0.0	0.1
		2036	0.1	0.0	0.1
		2045	0.1	0.0	0.1
Onsite Trucks	**Diesel**	2008	0.5	0.6	0.5
		2012	0.0	0.7	0.0
		2014	0.0	1.6	0.0
		2018	0.0	0.0	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	2008	0.0	0.0	0.0
		2012	0.0	0.1	0.0
		2014	0.1	0.1	0.0
		2018	0.1	1.7	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	**LNG+Diesel**	2008	4.6	0.5	4.0
		2012	1.8	0.6	0.5
		2014	2.7	1.4	0.3
		2018	3.2	1.3	0.1
		2023	2.7	1.5	0.0
		2030	2.9	1.7	0.0
		2036	2.9	1.7	0.0
		2045	2.8	1.7	0.0
Onsite PC	**Diesel/Gas/Elec**	2008	0.0	0.0	0.0
		2012	0.0	0.0	0.0
		2014	0.0	0.0	0.0
		2018	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**	2008	0.1	0.1	0.0
		2012	0.1	0.1	0.0
		2014	0.1	0.1	0.0
		2018	0.1	0.2	0.0
		2023	0.2	0.2	0.0
		2030	0.2	0.3	0.0
		2036	0.2	0.3	0.0
		2045	0.2	0.3	0.0
Rail Offsite	**Diesel**	2008	2.5		2.5
		2012	2.0		2.0
		2014	1.8	0.0	1.8
		2018	1.8		1.8
		2023	1.9	0.0	1.9
		2030	1.2	0.0	1.2
		2036	0.7	0.0	0.7
		2045	0.3	0.0	0.3
Rail Onsite	**Diesel**	2008	0.2		0.2
		2012	0.1		0.1
		2014	0.1	0.0	0.1
		2018	0.1		0.1
		2023	0.1	0.0	0.1
		2030	0.1	0.0	0.1
		2036	0.0	0.0	0.0
		2045	0.0	0.0	0.0
Grand Total			**78.5**	**26.7**	**52.6**

Emissions Inventory with Proposed Mitigations (Revised Project)

Table B1-669. Proposed Mitigated Scenario AnnualEmissions by Source Category and Analyis Year in ton/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	2008	40.94	54.78	1.05	15.66	171.71	0.09	0.73	199.50	13.08	497.57
	2012	80.30	75.81	0.71	15.61	108.02	0.07	0.49	176.47	12.06	469.55
	2014	168.10	198.83	2.06	33.28	213.86	0.06	0.35	171.44	12.59	800.57
	2018	133.29	311.07	0.99	32.48	206.41	0.08	0.30	202.64	11.65	898.90
	2023	59.06	293.55	0.93	22.58	110.17	0.06	0.19	243.95	11.96	742.46
	2030	6.91	236.19	0.99	25.62	96.31	0.05	0.13	177.25	8.50	551.94
	2036	7.52	153.50	1.04	25.84	88.85	0.04	0.11	114.60	5.98	397.47
	2045	7.03	67.48	0.94	25.84	97.57	0.04	0.11	62.08	3.81	264.89
Sum of VOC	2008	4.05	2.77	0.08	2.69	10.92	0.12	0.24	10.43	0.69	31.98
	2012	14.21	4.75	0.07	0.96	3.33	0.10	0.15	8.71	0.60	32.88
	2014	30.06	7.32	0.19	1.85	5.41	0.07	0.11	7.52	0.56	53.09
	2018	33.91	16.86	0.11	1.89	6.17	0.09	0.08	7.69	0.46	67.27
	2023	37.80	10.07	0.12	1.32	1.47	0.07	0.04	8.74	0.44	60.08
	2030	6.25	18.50	0.13	1.40	1.03	0.04	0.02	6.10	0.31	33.79
	2036	8.55	18.56	0.14	1.39	0.80	0.03	0.01	3.88	0.22	33.58
	2045	6.75	18.56	0.12	1.38	0.73	0.02	0.01	2.27	0.15	30.00
Sum of CO	2008	97.13	4.00	0.30	7.37	42.73	0.84	7.74	35.23	2.37	197.71
	2012	223.02	8.49	0.41	3.61	11.31	0.68	5.54	37.61	2.73	293.39
	2014	480.06	11.67	1.14	8.40	15.36	0.55	4.17	38.60	3.03	562.99
	2018	448.63	23.58	2.30	8.95	19.11	0.83	4.37	45.12	2.82	555.71
	2023	297.50	18.09	2.32	18.30	6.82	0.84	3.45	67.95	3.44	418.72
	2030	80.74	36.14	2.49	20.33	7.30	0.72	2.85	71.16	3.42	225.17
	2036	84.82	36.22	2.64	20.43	7.35	0.64	2.59	67.27	3.38	225.34
	2045	81.71	36.22	2.34	20.43	8.37	0.60	2.57	61.92	3.38	217.54
Sum of PM25	2008	0.95	3.20	0.04	0.60	5.30	0.00	0.05	6.45	0.42	17.02
	2012	1.96	1.73	0.02	0.09	2.27	0.00	0.05	5.47	0.35	11.95
	2014	2.07	3.04	0.07	0.09	2.48	0.00	0.05	4.72	0.33	12.86
	2018	1.65	4.00	0.02	0.11	3.39	0.00	0.09	4.65	0.25	14.16
	2023	1.32	3.80	0.02	0.06	2.19	0.00	0.11	5.16	0.24	12.90
	2030	0.34	5.42	0.02	0.06	2.32	0.00	0.12	3.43	0.16	11.87
	2036	0.40	5.43	0.03	0.06	2.26	0.00	0.11	1.99	0.10	10.38
	2045	0.36	5.43	0.02	0.06	2.11	0.00	0.12	0.94	0.05	9.09
Sum of PM10	2008	1.01	4.00	0.05	0.64	6.05	0.00	0.12	7.04	0.45	19.35
	2012	2.07	1.88	0.03	0.12	3.25	0.00	0.12	5.90	0.38	13.75
	2014	2.14	3.34	0.08	0.15	4.53	0.00	0.12	5.07	0.35	15.78
	2018	1.71	4.32	0.02	0.17	5.32	0.01	0.21	5.04	0.27	17.07
	2023	1.36	4.11	0.02	0.13	4.48	0.01	0.27	5.54	0.26	16.17
	2030	0.37	5.87	0.02	0.14	4.83	0.01	0.29	3.61	0.16	15.30
	2036	0.43	5.88	0.03	0.14	4.80	0.01	0.28	2.05	0.10	13.72
	2045	0.38	5.88	0.02	0.14	4.66	0.01	0.29	0.94	0.05	12.37
Sum of PM10TW	2008				0.01	0.30	0.00	0.02			0.33
	2012				0.01	0.52	0.00	0.02			0.56
	2014	0.00	0.00	0.00	0.03	1.15	0.00	0.02	0.00	0.00	1.20
	2018				0.03	1.05	0.00	0.04			1.12
	2023		0.00	0.00	0.04	1.30	0.00	0.05	0.00	0.00	1.39
	2030		0.00	0.00	0.04	1.43	0.00	0.05	0.00	0.00	1.52
	2036		0.00	0.00	0.04	1.45	0.00	0.05	0.00	0.00	1.54
	2045		0.00	0.00	0.04	1.46	0.00	0.05	0.00	0.00	1.55
Sum of PM10BW	2008				0.02	0.52	0.00	0.09			0.62
	2012				0.02	0.90	0.00	0.09			1.02
	2014	0.00	0.00	0.00	0.06	1.97	0.00	0.09	0.00	0.00	2.12
	2018				0.05	1.81	0.01	0.16			2.03
	2023		0.00	0.00	0.07	2.23	0.01	0.21	0.00	0.00	2.51
	2030		0.00	0.00	0.08	2.45	0.01	0.23	0.00	0.00	2.76
	2036		0.00	0.00	0.08	2.49	0.01	0.23	0.00	0.00	2.80
	2045		0.00	0.00	0.08	2.50	0.01	0.23	0.00	0.00	2.81
Sum of SOx	2008	0.03	43.14	0.00	0.01	0.15	0.00	0.01	0.14	0.01	43.49
	2012	0.08	8.13	0.00	0.02	0.25	0.00	0.01	0.15	0.01	8.65
	2014	0.15	7.52	0.00	0.04	0.54	0.00	0.01	0.15	0.01	8.42
	2018	0.12	9.89	0.00	0.04	0.49	0.00	0.01	0.18	0.01	10.74
	2023	0.16	8.91	0.00	0.05	0.58	0.00	0.01	0.26	0.01	10.00
	2030	0.18	9.04	0.00	0.05	0.53	0.00	0.01	0.28	0.01	10.10
	2036	0.18	9.05	0.00	0.04	0.46	0.00	0.01	0.26	0.01	10.02
	2045	0.18	9.05	0.00	0.04	0.40	0.00	0.01	0.24	0.01	9.93
Sum of CO2	2008	7267.02	2602.41	45.21	1294.26	14975.26	48.89	818.11	13597.00	911.57	41559.73
	2012	15997.42	4010.63	53.38	2244.12	25063.94	49.93	830.81	14512.34	1048.07	63810.64
	2014	28116.33	13010.84	147.82	5541.12	53495.69	45.70	774.16	14896.86	1161.31	117189.84
	2018	22783.62	14896.99	290.79	5212.30	48706.91	84.74	1289.95	17408.67	1080.94	111754.91
	2023	32844.38	13424.38	281.10	6377.40	54915.88	94.05	1457.95	26219.68	1323.23	136938.07
	2030	33403.23	13613.55	281.10	6073.99	51823.29	87.05	1338.86	27458.44	1314.66	135394.17
	2036	33431.77	13626.87	281.10	5307.14	45383.67	79.94	1224.13	25956.64	1301.43	126592.70
	2045	33455.38	13626.87	281.10	4594.07	40083.61	78.30	1219.53	23890.20	1301.26	118530.33
Sum of CH4	2008	0.53	0.03	0.00	0.16	0.73	0.02	0.05	1.10	0.07	2.69
	2012	1.45	0.05	0.00	0.05	0.22	0.02	0.03	1.17	0.08	3.08
	2014	2.98	0.15	0.00	0.10	0.36	0.01	0.02	1.21	0.09	4.93
	2018	2.84	0.17	0.01	0.11	0.41	0.02	0.02	1.41	0.09	5.07
	2023	12.25	0.18	0.01	0.06	0.10	0.02	0.01	2.12	0.11	14.86
	2030	19.84	0.18	0.01	0.07	0.07	0.01	0.01	2.22	0.11	22.51
	2036	19.83	0.18	0.01	0.07	0.05	0.01	0.00	2.10	0.10	22.35
	2045	19.57	0.18	0.01	0.07	0.05	0.01	0.00	1.93	0.10	21.92
Sum of N2O	2008	0.00	0.17	0.00	0.08	2.54	0.01	0.05	0.36	0.02	3.24
	2012	0.00	0.23	0.00	0.12	4.39	0.01	0.04	0.38	0.03	5.19
	2014	0.00	0.87	0.01	0.27	9.42	0.01	0.03	0.39	0.03	11.02
	2018	0.00	1.00	0.01	0.25	8.67	0.01	0.03	0.46	0.03	10.46
	2023	0.00	0.87	0.01	0.32	10.28	0.01	0.02	0.69	0.03	12.24
	2030	0.00	0.78	0.01	0.29	9.45	0.01	0.02	0.72	0.03	11.31
	2036	0.00	0.78	0.01	0.25	8.20	0.01	0.02	0.68	0.03	9.98
	2045	0.00	0.78	0.01	0.21	7.05	0.01	0.02	0.63	0.03	8.75
Sum of DPM	2008	0.64	3.11	0.05	0.61	5.23	0.00	0.00	7.04	0.45	17.13
	2012	1.35	1.79	0.03	0.07	1.65	0.00	0.00	5.90	0.38	11.17
	2014	0.92	2.48	0.08	0.06	1.31	0.00	0.00	5.07	0.35	10.27
	2018	0.71	3.41	0.02	0.08	2.26	0.00	0.00	5.04	0.27	11.79
	2023	0.58	3.50	0.02	0.02	0.88	0.00	0.00	5.54	0.26	10.79
	2030	0.30	5.27	0.02	0.02	0.88	0.00	0.00	3.61	0.16	10.27
	2036	0.36	5.28	0.03	0.02	0.80	0.00	0.00	2.05	0.10	8.63
	2045	0.31	5.28	0.02	0.02	0.65	0.00	0.00	0.94	0.05	7.28

Table B1-670. 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	2008	0.6		0.6
		2012	1.3		1.3
		2014	0.9	0.0	0.9
		2018	0.7		0.7
		2023	0.6		0.6
		2030	0.3		0.3
		2036	0.4		0.4
		2045	0.3		0.3
	LPG	2008	0.4		0.0
		2012	0.7		0.0
		2014	1.2	0.0	0.0
		2018	1.0		0.0
		2023	0.7		0.0
OGV	MGO/MDO	2008	4.0		3.1
		2012	1.9		1.8
		2014	3.3	0.0	2.5
		2018	4.3		3.4
		2023	4.1	0.0	3.5
		2030	5.9	0.0	5.3
		2036	5.9	0.0	5.3
		2045	5.9	0.0	5.3
Harbor Craft	MGO/MDO	2008	0.0		0.0
		2012	0.0		0.0
		2014	0.1	0.0	0.1
		2018	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
Onsite Trucks	Diesel	2008	0.6	0.9	0.6
		2012	0.1	1.2	0.1
		2014	0.1	2.7	0.1
		2018	0.2	0.0	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	2008	0.0	0.0	0.0
		2012	0.0	0.1	0.0
		2014	0.0	0.2	0.0
		2018	0.0	2.8	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	LNG+Diesel	2008	6.0	0.6	5.2
		2012	3.3	1.1	1.6
		2014	4.5	2.4	1.3
		2018	5.3	2.2	2.3
		2023	4.5	2.6	0.9
		2030	4.8	2.9	0.9
		2036	4.8	2.9	0.8
		2045	4.7	2.9	0.7
Onsite PC	Diesel/Gas/Elec	2008	0.0	0.0	0.0
		2012	0.0	0.0	0.0
		2014	0.0	0.0	0.0
		2018	0.0	0.1	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	2008	0.1	0.2	0.0
		2012	0.1	0.2	0.0
		2014	0.1	0.2	0.0
		2018	0.2	0.4	0.0
		2023	0.3	0.4	0.0
		2030	0.3	0.5	0.0
		2036	0.3	0.5	0.0
		2045	0.3	0.5	0.0
Rail Offsite	Diesel	2008	7.0		7.0
		2012	5.9		5.9
		2014	5.1	0.0	5.1
		2018	5.0		5.0
		2023	5.5	0.0	5.5
		2030	3.6	0.0	3.6
		2036	2.1	0.0	2.1
		2045	0.9	0.0	0.9
Rail Onsite	Diesel	2008	0.5		0.5
		2012	0.4		0.4
		2014	0.4	0.0	0.4
		2018	0.3		0.3
		2023	0.3	0.0	0.3
		2030	0.2	0.0	0.2
		2036	0.1	0.0	0.1
		2045	0.1	0.0	0.1
Grand Total			123.3	44.5	87.3

Table B1-671. Proposed Mitigated Scenario Peakday 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	2008	349.67	1,138.36	40.27	133.70	1,466.46	0.80	6.26	1,703.78	111.75	4,951.05
	2012	641.36	1,005.53	27.26	124.69	862.76	0.59	3.94	1,409.41	96.32	4,171.85
	2014	1,397.95	5,029.09	48.56	276.74	1,778.48	0.47	2.88	1,425.72	104.71	10,064.60
	2018	1,126.77	4,238.71	20.26	274.53	1,744.86	0.64	2.57	1,713.03	98.44	9,219.81
	2023	478.35	6,365.91	19.94	182.88	892.23	0.52	1.54	1,975.64	96.84	10,013.85
	2030	55.96	5,294.19	21.11	207.46	779.95	0.41	1.02	1,435.51	68.85	7,864.46
	2036	60.88	3,424.61	22.12	209.23	719.56	0.36	0.87	928.14	48.43	5,414.21
	2045	56.90	1,479.56	20.04	209.24	790.22	0.36	0.86	502.73	30.84	3,090.75
Sum of VOC	2008	34.55	61.90	2.89	22.96	93.22	1.04	2.03	89.08	5.92	313.60
	2012	113.49	69.13	2.55	7.65	26.58	0.77	1.23	69.60	4.79	295.78
	2014	249.95	241.55	4.56	15.36	44.96	0.62	0.89	62.53	4.69	625.12
	2018	286.65	301.10	2.28	15.98	52.12	0.78	0.72	65.02	3.91	728.57
	2023	306.12	220.74	2.47	10.70	11.89	0.56	0.36	70.78	3.60	627.22
	2030	50.61	403.00	2.74	11.37	8.32	0.36	0.18	49.44	2.50	528.52
	2036	69.25	403.00	2.98	11.23	6.50	0.25	0.12	31.45	1.76	526.53
	2045	54.67	403.00	2.48	11.16	5.93	0.19	0.09	18.42	1.23	497.17
Sum of CO	2008	829.48	70.44	11.47	62.92	364.94	7.17	66.11	300.90	20.23	1733.64
	2012	1781.17	125.22	15.68	28.83	90.35	5.44	44.21	300.35	21.79	2413.05
	2014	3992.15	334.25	26.95	69.87	127.77	4.61	34.66	321.03	25.16	4936.44
	2018	3792.45	155.03	47.00	75.66	161.55	7.03	36.95	381.41	23.84	4680.92
	2023	2409.37	412.22	49.57	148.21	55.20	6.81	27.98	550.34	27.88	3687.59
	2030	653.92	797.41	53.22	164.65	59.11	5.84	23.11	576.34	27.69	2361.31
	2036	686.97	797.41	56.35	165.45	59.55	5.16	20.96	544.81	27.40	2364.07
	2045	661.75	797.41	50.02	165.45	67.80	4.85	20.78	501.45	27.40	2296.91
Sum of PM25	2008	8.15	86.70	1.60	5.09	45.26	0.02	0.43	55.09	3.56	205.91
	2012	15.65	28.88	0.90	0.72	18.11	0.02	0.40	43.65	2.83	111.16
	2014	17.18	82.53	1.66	0.77	20.66	0.02	0.40	39.28	2.72	165.21
	2018	13.95	45.74	0.45	0.95	28.64	0.03	0.73	39.28	2.10	131.87
	2023	10.68	86.20	0.41	0.46	17.73	0.04	0.89	41.79	1.96	160.15
	2030	2.78	123.61	0.48	0.50	18.81	0.04	0.95	27.75	1.26	176.17
	2036	3.22	123.61	0.54	0.49	18.29	0.04	0.92	16.15	0.79	164.05
	2045	2.88	123.61	0.42	0.49	17.11	0.03	0.93	7.63	0.43	153.54
Sum of PM10	2008	8.59	107.78	1.74	5.45	51.66	0.04	0.99	60.10	3.88	240.24
	2012	16.51	31.22	0.98	0.95	25.99	0.03	0.96	47.15	3.06	126.85
	2014	17.79	90.34	1.80	1.26	37.66	0.03	0.96	42.13	2.91	194.90
	2018	14.44	49.49	0.49	1.43	44.97	0.07	1.76	42.57	2.28	157.49
	2023	11.05	93.32	0.45	1.02	36.25	0.08	2.16	44.84	2.10	191.27
	2030	2.98	133.86	0.52	1.12	39.12	0.08	2.33	29.22	1.32	210.55
	2036	3.45	133.86	0.59	1.11	38.90	0.08	2.28	16.61	0.81	197.70
	2045	3.08	133.86	0.45	1.11	37.75	0.08	2.32	7.64	0.43	186.72
Sum of PM10TW	2008				0.08	2.58	0.00	0.16			2.83
	2012				0.12	4.19	0.00	0.16			4.48
	2014	0.00	0.00	0.00	0.27	9.53	0.00	0.17	0.00	0.00	9.97
	2018				0.26	8.92	0.01	0.30			9.49
	2023		0.00	0.00	0.32	10.51	0.01	0.38	0.00	0.00	11.22
	2030		0.00	0.00	0.36	11.55	0.01	0.41	0.00	0.00	12.32
	2036		0.00	0.00	0.36	11.74	0.01	0.40	0.00	0.00	12.51
	2045		0.00	0.00	0.36	11.79	0.01	0.41	0.00	0.00	12.57
Sum of PM10BW	2008				0.14	4.42	0.02	0.75			5.34
	2012				0.20	7.19	0.02	0.75			8.16
	2014	0.00	0.00	0.00	0.47	16.34	0.02	0.76	0.00	0.00	17.60
	2018				0.45	15.29	0.05	1.39			17.18
	2023		0.00	0.00	0.55	18.03	0.06	1.72	0.00	0.00	20.36
	2030		0.00	0.00	0.61	19.80	0.06	1.87	0.00	0.00	22.35
	2036		0.00	0.00	0.61	20.13	0.06	1.85	0.00	0.00	22.65
	2045		0.00	0.00	0.61	20.21	0.06	1.88	0.00	0.00	22.77
Sum of SOx	2008	0.28	1154.16	0.02	0.08	1.27	0.00	0.07	1.17	0.08	1157.14
	2012	0.64	155.04	0.02	0.14	2.02	0.00	0.07	1.17	0.08	159.17
	2014	1.21	156.06	0.04	0.37	4.46	0.00	0.06	1.25	0.10	163.55
	2018	0.98	112.05	0.06	0.35	4.16	0.01	0.11	1.49	0.09	119.29
	2023	1.30	195.06	0.06	0.38	4.67	0.01	0.12	2.14	0.11	203.86
	2030	1.43	203.90	0.06	0.38	4.30	0.01	0.11	2.25	0.11	212.54
	2036	1.43	203.90	0.06	0.33	3.74	0.01	0.10	2.12	0.11	211.81
	2045	1.43	203.90	0.06	0.29	3.22	0.01	0.10	1.95	0.11	211.08
Sum of CO2	2008	62061.03	73496.74	1727.46	11052.99	127890.05	417.55	6986.72	116119.66	7784.91	407537.12
	2012	127766.54	70776.17	2057.40	17922.93	200178.19	398.80	6635.45	115905.70	8370.60	550011.77
	2014	233815.08	310793.00	3484.09	46079.50	444869.51	380.07	6437.90	123882.15	9657.47	1179398.77
	2018	192599.11	168434.43	5953.72	44061.26	411739.09	716.31	10904.47	147162.48	9137.63	990708.51
	2023	265996.60	293160.40	6004.67	51648.23	444746.93	761.72	11807.49	212345.16	10716.45	1297187.64
	2030	270522.55	306416.04	6004.67	49190.99	419700.93	705.01	10843.01	222377.46	10647.02	1296407.68
	2036	270753.71	306416.04	6004.67	42980.52	367548.42	647.44	9913.84	210214.91	10539.86	1225019.42
	2045	270944.85	306416.04	6004.67	37205.67	324624.92	634.12	9876.62	193479.44	10538.51	1159724.85
Sum of CH4	2008	4.52	0.58	0.04	1.39	6.26	0.19	0.39	9.40	0.63	23.40
	2012	11.57	0.60	0.04	0.44	1.79	0.15	0.25	9.38	0.67	24.88
	2014	24.75	4.59	0.07	0.86	3.02	0.12	0.18	10.03	0.77	44.40
	2018	24.01	1.80	0.12	0.91	3.50	0.16	0.17	11.91	0.73	43.32
	2023	99.24	3.85	0.12	0.52	0.80	0.13	0.10	17.19	0.86	122.81
	2030	160.70	3.99	0.12	0.54	0.56	0.09	0.05	18.00	0.86	184.91
	2036	160.58	3.99	0.12	0.53	0.44	0.07	0.04	17.01	0.85	183.63
	2045	158.45	3.99	0.12	0.53	0.40	0.05	0.03	15.66	0.85	180.09
Sum of N2O	2008	0.00	4.47	0.08	0.67	21.73	0.06	0.42	3.06	0.20	30.68
	2012	0.00	4.06	0.09	0.97	35.05	0.05	0.28	3.05	0.22	43.78
	2014	0.00	19.02	0.16	2.25	78.35	0.04	0.22	3.26	0.25	103.55
	2018	0.00	11.34	0.27	2.15	73.30	0.07	0.24	3.87	0.24	91.49
	2023	0.00	17.86	0.27	2.55	83.29	0.07	0.19	5.59	0.28	110.11
	2030	0.00	16.38	0.27	2.37	76.49	0.06	0.16	5.85	0.28	101.86
	2036	0.00	16.38	0.27	2.03	66.37	0.06	0.14	5.53	0.28	91.06
	2045	0.00	16.38	0.27	1.74	57.12	0.06	0.15	5.09	0.28	81.07
Sum of DPM	2008	5.47	82.81	1.74	5.24	44.65	0.00	0.00	60.10	3.88	203.89
	2012	10.78	29.50	0.98	0.57	13.17	0.00	0.00	47.15	3.06	105.21
	2014	7.69	76.37	1.80	0.48	10.87	0.00	0.00	42.13	2.91	142.26
	2018	6.01	39.31	0.49	0.66	19.14	0.00	0.00	42.57	2.28	110.46
	2023	4.70	82.99	0.45	0.14	7.11	0.00	0.00	44.84	2.10	142.32
	2030	2.42	123.82	0.52	0.14	7.17	0.00	0.00	29.22	1.32	164.61
	2036	2.90	123.82	0.59	0.13	6.49	0.00	0.00	16.61	0.81	151.34
	2045	2.52	123.82	0.45	0.13	5.30	0.00	0.00	7.64	0.43	140.29

Table B1-672. Peakday Proposed Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/day

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	Diesel	2008	5.5		5.5
		2012	10.8		10.8
		2014	7.7	0.0	7.7
		2018	6.0		6.0
		2023	4.7		4.7
		2030	2.4		2.4
		2036	2.9		2.9
		2045	2.5		2.5
	LPG	2008	3.1		0.0
		2012	5.7		0.0
		2014	10.1	0.0	0.0
		2018	8.4		0.0
		2023	6.1		0.0
OGV	MDO/MGO	2008	107.8		82.8
		2012	31.2		29.5
		2014	90.3	0.0	76.4
		2018	49.5		39.3
		2023	93.3	0.0	83.0
		2030	133.9	0.0	123.8
		2036	133.9	0.0	123.8
		2045	133.9	0.0	123.8
Harbor Craft	MDO/MGO	2008	1.7		1.7
		2012	1.0		1.0
		2014	1.8	0.0	1.8
		2018	0.5		0.5
		2023	0.4	0.0	0.4
		2030	0.5	0.0	0.5
		2036	0.6	0.0	0.6
		2045	0.5	0.0	0.5
Onsite Trucks	Diesel	2008	5.5	7.3	5.2
		2012	0.9	9.5	0.6
		2014	1.2	22.7	0.5
		2018	1.3	0.0	0.7
		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	2008	0.0	0.0	0.0
		2012	0.1	1.1	0.0
		2014	0.1	2.0	0.0
		2018	0.1	23.8	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	LNG+Diesel	2008	51.7	5.3	44.7
		2012	26.0	8.5	13.2
		2014	37.7	20.0	10.9
		2018	45.0	18.5	19.1
		2023	36.3	20.9	7.1
		2030	39.1	23.1	7.2
		2036	38.9	23.7	6.5
		2045	37.8	23.6	5.3
Onsite PC	Diesel/Gas/Elec	2008	0.0	0.2	0.0
		2012	0.0	0.2	0.0
		2014	0.0	0.2	0.0
		2018	0.1	0.5	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	2008	1.0	1.6	0.0
		2012	1.0	1.6	0.0
		2014	1.0	1.7	0.0
		2018	1.8	3.0	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	2008	60.1		60.1
		2012	47.2		47.2
		2014	42.1	0.0	42.1
		2018	42.6		42.6
		2023	44.8	0.0	44.8
		2030	29.2	0.0	29.2
		2036	16.6	0.0	16.6
		2045	7.6	0.0	7.6
Rail Onsite	Diesel	2008	3.9		3.9
		2012	3.1		3.1
		2014	2.9	0.0	2.9
		2018	2.3		2.3
		2023	2.1	0.0	2.1
		2030	1.3	0.0	1.3
		2036	0.8	0.0	0.8
		2045	0.4	0.0	0.4
Grand Total			1503.7	363.9	1160.4

Table B1-673. Proposed Mitigated Scenario Peak 8hr 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	2008	216.58	645.31	40.27	82.81	908.30	0.50	3.88	567.93	37.25	2,502.83
	2012	315.34	519.38	27.26	61.31	424.20	0.29	1.94	469.80	32.11	1,851.62
	2014	684.47	3,663.32	7.71	135.50	870.79	0.23	1.41	475.24	34.90	5,873.56
	2018	555.60	2,842.78	11.07	135.37	860.38	0.32	1.27	571.01	32.81	5,010.60
	2023	253.39	2,048.22	7.17	96.88	472.63	0.27	0.82	658.55	32.28	3,570.21
	2030	29.64	1,838.66	6.08	109.89	413.15	0.21	0.54	478.50	22.95	2,899.64
	2036	32.25	1,080.74	6.37	110.84	381.16	0.19	0.46	309.38	16.14	1,937.53
	2045	30.14	572.27	5.77	110.84	418.59	0.19	0.46	167.58	10.28	1,316.12
Sum of VOC	2008	21.40	44.98	2.89	14.22	57.74	0.65	1.26	29.69	1.97	174.81
	2012	55.80	45.80	2.55	3.76	13.07	0.38	0.60	23.20	1.60	146.76
	2014	122.38	181.09	0.84	7.52	22.01	0.30	0.44	20.84	1.56	357.00
	2018	141.35	218.65	1.25	7.88	25.70	0.38	0.35	21.67	1.30	418.55
	2023	162.16	63.69	0.89	5.67	6.30	0.30	0.19	23.59	1.20	263.98
	2030	26.81	169.68	0.79	6.02	4.41	0.19	0.10	16.48	0.83	225.30
	2036	36.68	169.68	0.86	5.95	3.44	0.13	0.06	10.48	0.59	227.87
	2045	28.96	169.68	0.72	5.91	3.14	0.10	0.05	6.14	0.41	215.10
Sum of CO	2008	513.77	29.09	11.47	38.97	226.04	4.44	40.95	100.30	6.74	971.77
	2012	875.77	71.91	15.68	14.18	44.42	2.68	21.74	100.12	7.26	1153.75
	2014	1954.65	209.65	4.94	34.21	62.56	2.26	16.97	107.01	8.39	2400.63
	2018	1870.03	79.87	25.68	37.31	79.66	3.47	18.22	127.14	7.95	2249.31
	2023	1276.28	109.08	17.83	78.51	29.24	3.61	14.82	183.45	9.29	1722.12
	2030	346.39	316.14	15.33	87.22	31.31	3.10	12.24	192.11	9.23	1013.07
	2036	363.90	316.14	16.23	87.64	31.54	2.73	11.10	181.60	9.13	1020.02
	2045	350.54	316.14	14.40	87.64	35.91	2.57	11.01	167.15	9.13	994.50
Sum of PM25	2008	5.05	36.83	1.60	3.15	28.03	0.01	0.27	18.36	1.19	94.51
	2012	7.69	14.58	0.90	0.36	8.90	0.01	0.20	14.55	0.94	48.14
	2014	8.41	52.57	0.25	0.38	10.12	0.01	0.20	13.09	0.91	85.92
	2018	6.88	24.12	0.25	0.47	14.12	0.02	0.36	13.09	0.70	60.01
	2023	5.66	27.09	0.15	0.24	9.39	0.02	0.47	13.93	0.65	57.61
	2030	1.47	49.08	0.14	0.26	9.96	0.02	0.50	9.25	0.42	71.11
	2036	1.71	49.08	0.16	0.26	9.69	0.02	0.49	5.38	0.26	67.04
	2045	1.53	49.08	0.12	0.26	9.06	0.02	0.49	2.54	0.14	63.25
Sum of PM10	2008	5.32	45.82	1.74	3.38	32.00	0.02	0.61	20.03	1.29	110.22
	2012	8.12	15.78	0.98	0.47	12.78	0.02	0.47	15.72	1.02	55.35
	2014	8.71	57.25	0.27	0.62	18.44	0.02	0.47	14.04	0.97	100.80
	2018	7.12	26.11	0.27	0.70	22.17	0.03	0.87	14.19	0.76	72.22
	2023	5.86	29.33	0.16	0.54	19.20	0.04	1.14	14.95	0.70	71.92
	2030	1.58	53.15	0.15	0.59	20.72	0.04	1.23	9.74	0.44	87.65
	2036	1.83	53.15	0.17	0.59	20.60	0.04	1.21	5.54	0.27	83.40
	2045	1.63	53.15	0.13	0.59	20.00	0.04	1.23	2.55	0.14	79.46
Sum of PM10TW	2008				0.05	1.60	0.00	0.10			1.75
	2012				0.06	2.06	0.00	0.08			2.20
	2014	0.00	0.00	0.00	0.13	4.67	0.00	0.08	0.00	0.00	4.88
	2018				0.13	4.40	0.01	0.15			4.68
	2023		0.00	0.00	0.17	5.57	0.01	0.20	0.00	0.00	5.94
	2030		0.00	0.00	0.19	6.12	0.01	0.22	0.00	0.00	6.53
	2036		0.00	0.00	0.19	6.22	0.01	0.21	0.00	0.00	6.63
	2045		0.00	0.00	0.19	6.24	0.01	0.22	0.00	0.00	6.66
Sum of PM10BW	2008				0.08	2.74	0.01	0.47			3.30
	2012				0.10	3.53	0.01	0.37			4.01
	2014	0.00	0.00	0.00	0.23	8.00	0.01	0.37	0.00	0.00	8.62
	2018				0.22	7.54	0.02	0.69			8.47
	2023		0.00	0.00	0.29	9.55	0.03	0.91	0.00	0.00	10.78
	2030		0.00	0.00	0.32	10.49	0.03	0.99	0.00	0.00	11.84
	2036		0.00	0.00	0.32	10.66	0.03	0.98	0.00	0.00	12.00
	2045		0.00	0.00	0.32	10.71	0.03	1.00	0.00	0.00	12.06
Sum of SOx	2008	0.17	444.49	0.02	0.05	0.79	0.00	0.04	0.39	0.03	445.98
	2012	0.31	60.93	0.02	0.07	0.99	0.00	0.03	0.39	0.03	62.78
	2014	0.59	105.53	0.01	0.18	2.19	0.00	0.03	0.42	0.03	108.97
	2018	0.48	53.73	0.03	0.17	2.05	0.00	0.05	0.50	0.03	57.05
	2023	0.69	66.52	0.02	0.20	2.47	0.00	0.06	0.71	0.04	70.72
	2030	0.76	78.24	0.02	0.20	2.28	0.00	0.06	0.75	0.04	82.34
	2036	0.76	78.24	0.02	0.18	1.98	0.00	0.05	0.71	0.04	81.97
	2045	0.76	78.24	0.02	0.15	1.71	0.00	0.05	0.65	0.04	81.62
Sum of CO2	2008	38439.76	28299.68	1727.46	6846.07	79213.36	258.63	4327.48	38706.55	2594.97	200413.96
	2012	62820.16	27826.12	2057.40	8812.33	98423.47	196.08	3262.51	38635.23	2790.20	244823.51
	2014	114481.23	184121.12	626.34	22561.58	217818.32	186.09	3152.15	41294.05	3219.16	587460.03
	2018	94969.39	80795.85	3252.70	21726.33	203025.92	353.21	5376.92	49054.16	3045.88	461600.36
	2023	140902.84	99877.06	2160.02	27358.93	235589.87	403.49	6254.62	70781.72	3572.15	586900.71
	2030	143300.31	117513.40	1729.30	26057.29	222322.59	373.46	5743.72	74125.82	3549.01	594714.88
	2036	143422.76	117513.40	1729.30	22767.50	194696.53	342.96	5251.53	70071.64	3513.29	559308.90
	2045	143524.01	117513.40	1729.30	19708.46	171959.24	335.90	5231.81	64493.15	3512.84	528008.11
Sum of CH4	2008	2.80	0.26	0.04	0.86	3.88	0.12	0.24	3.13	0.21	11.54
	2012	5.69	0.27	0.04	0.22	0.88	0.07	0.12	3.13	0.22	10.64
	2014	12.12	3.44	0.01	0.42	1.48	0.06	0.09	3.34	0.26	21.23
	2018	11.84	1.07	0.07	0.45	1.73	0.08	0.08	3.97	0.24	19.53
	2023	52.57	1.19	0.04	0.28	0.42	0.07	0.05	5.73	0.29	60.63
	2030	85.12	1.47	0.04	0.29	0.30	0.05	0.03	6.00	0.29	93.58
	2036	85.06	1.47	0.04	0.28	0.23	0.03	0.02	5.67	0.28	93.09
	2045	83.94	1.47	0.04	0.28	0.21	0.03	0.02	5.22	0.28	91.48
Sum of N2O	2008	0.00	1.73	0.08	0.42	13.46	0.04	0.26	1.02	0.07	17.07
	2012	0.00	1.55	0.09	0.48	17.23	0.02	0.14	1.02	0.07	20.61
	2014	0.00	11.24	0.03	1.10	38.36	0.02	0.11	1.09	0.08	52.03
	2018	0.00	5.57	0.15	1.06	36.14	0.04	0.12	1.29	0.08	44.45
	2023	0.00	6.22	0.10	1.35	44.12	0.04	0.10	1.86	0.09	53.89
	2030	0.00	6.28	0.08	1.26	40.52	0.03	0.08	1.95	0.09	50.29
	2036	0.00	6.28	0.08	1.08	35.16	0.03	0.08	1.84	0.09	44.63
	2045	0.00	6.28	0.08	0.92	30.26	0.03	0.08	1.70	0.09	39.43
Sum of DPM	2008	3.39	37.49	1.74	3.24	27.66	0.00	0.00	20.03	1.29	94.85
	2012	5.30	15.21	0.98	0.28	6.48	0.00	0.00	15.72	1.02	44.98
	2014	3.77	51.34	0.27	0.24	5.32	0.00	0.00	14.04	0.97	75.95
	2018	2.96	22.43	0.27	0.33	9.44	0.00	0.00	14.19	0.76	50.37
	2023	2.49	25.19	0.16	0.07	3.77	0.00	0.00	14.95	0.70	47.32
	2030	1.28	49.15	0.15	0.07	3.80	0.00	0.00	9.74	0.44	64.63
	2036	1.53	49.15	0.17	0.07	3.44	0.00	0.00	5.54	0.27	60.17
	2045	1.34	49.15	0.13	0.07	2.81	0.00	0.00	2.55	0.14	56.19

Table B1-674. Peak 8hr Proposed 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	2008	3.4		3.4
		2012	5.3		5.3
		2014	3.8	0.0	3.8
		2018	3.0		3.0
		2023	2.5		2.5
		2030	1.3		1.3
		2036	1.5		1.5
		2045	1.3		1.3
	LPG	2008	1.9		0.0
		2012	2.8		0.0
		2014	4.9	0.0	0.0
		2018	4.2		0.0
		2023	3.2		0.0
OGV	MDO/MGO	2008	45.8		37.5
		2012	15.8		15.2
		2014	57.3	0.0	51.3
		2018	26.1		22.4
		2023	29.3	0.0	25.2
		2030	53.1	0.0	49.2
		2036	53.1	0.0	49.2
		2045	53.1	0.0	49.2
Harbor Craft	MDO/MGO	2008	1.7		1.7
		2012	1.0		1.0
		2014	0.3	0.0	0.3
		2018	0.3		0.3
		2023	0.2	0.0	0.2
		2030	0.1	0.0	0.1
		2036	0.2	0.0	0.2
		2045	0.1	0.0	0.1
Onsite Trucks	Diesel	2008	3.4	4.5	3.2
		2012	0.4	4.7	0.3
		2014	0.6	11.1	0.2
		2018	0.6	0.0	0.3
		2023	0.5	14.2	0.1
		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	2008	0.0	0.0	0.0
		2012	0.0	0.5	0.0
		2014	0.1	1.0	0.0
		2018	0.1	11.7	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	LNG+Diesel	2008	32.0	3.3	27.7
		2012	12.8	4.2	6.5
		2014	18.4	9.8	5.3
		2018	22.2	9.1	9.4
		2023	19.2	11.1	3.8
		2030	20.7	12.3	3.8
		2036	20.6	12.6	3.4
		2045	20.0	12.5	2.8
Onsite PC	Diesel/Gas/Elec	2008	0.0	0.2	0.0
		2012	0.0	0.1	0.0
		2014	0.0	0.1	0.0
		2018	0.0	0.2	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	2008	0.6	1.0	0.0
		2012	0.5	0.8	0.0
		2014	0.5	0.8	0.0
		2018	0.9	1.5	0.0
		2023	1.1	1.8	0.0
		2030	1.2	2.0	0.0
		2036	1.2	2.0	0.0
		2045	1.2	2.0	0.0
Rail Offsite	Diesel	2008	20.0		20.0
		2012	15.7		15.7
		2014	14.0	0.0	14.0
		2018	14.2		14.2
		2023	14.9	0.0	14.9
		2030	9.7	0.0	9.7
		2036	5.5	0.0	5.5
		2045	2.5	0.0	2.5
Rail Onsite	Diesel	2008	1.3		1.3
		2012	1.0		1.0
		2014	1.0	0.0	1.0
		2018	0.8		0.8
		2023	0.7	0.0	0.7
		2030	0.4	0.0	0.4
		2036	0.3	0.0	0.3
		2045	0.1	0.0	0.1
Grand Total			**660.0**	**189.7**	**494.5**

Table B1-675. Proposed Mitigated Scenario Peak hour 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	2008	30.98	30.82	40.27	11.85	129.93	0.07	0.55	70.99	4.66	320.11
	2012	45.06	30.38	27.26	8.76	60.62	0.04	0.28	58.73	4.01	235.14
	2014	98.43	566.40	7.71	19.49	125.22	0.03	0.20	59.40	4.36	881.24
	2018	79.85	414.20	0.00	19.46	123.66	0.05	0.18	71.38	4.10	712.87
	2023	35.25	93.87	0.00	13.48	65.74	0.04	0.11	82.32	4.04	294.84
	2030	4.12	151.51	2.36	15.29	57.47	0.03	0.08	59.81	2.87	293.54
	2036	4.49	86.39	2.47	15.42	53.02	0.03	0.06	38.67	2.02	202.56
	2045	4.19	50.60	2.24	15.42	58.23	0.03	0.06	20.95	1.29	153.00
Sum of VOC	2008	3.06	1.06	2.89	2.03	8.26	0.09	0.18	3.71	0.25	21.54
	2012	7.97	1.46	2.55	0.54	1.87	0.05	0.09	2.90	0.20	17.63
	2014	17.60	29.28	0.84	1.08	3.17	0.04	0.06	2.61	0.20	54.88
	2018	20.32	27.08	0.00	1.13	3.69	0.06	0.05	2.71	0.16	55.20
	2023	22.56	3.50	0.00	0.79	0.88	0.04	0.03	2.95	0.15	30.89
	2030	3.73	20.10	0.31	0.84	0.61	0.03	0.01	2.06	0.10	27.79
	2036	5.10	20.10	0.33	0.83	0.48	0.02	0.01	1.31	0.07	28.25
	2045	4.03	20.10	0.28	0.82	0.44	0.01	0.01	0.77	0.05	26.50
Sum of CO	2008	73.49	2.58	11.47	5.57	32.33	0.64	5.86	12.54	0.84	145.32
	2012	125.15	3.33	15.68	2.03	6.35	0.38	3.11	12.51	0.91	169.45
	2014	281.09	30.18	4.94	4.92	9.00	0.32	2.44	13.38	1.05	347.31
	2018	268.77	11.00	0.00	5.36	11.45	0.50	2.62	15.89	0.99	316.58
	2023	177.54	8.87	0.00	10.92	4.07	0.50	2.06	22.93	1.16	228.05
	2030	48.18	29.19	5.94	12.13	4.36	0.43	1.70	24.01	1.15	127.11
	2036	50.62	29.19	6.29	12.19	4.39	0.38	1.54	22.70	1.14	128.45
	2045	48.76	29.19	5.58	12.19	5.00	0.36	1.53	20.89	1.14	124.65
Sum of PM25	2008	0.72	3.12	1.60	0.45	4.01	0.00	0.04	2.30	0.15	12.39
	2012	1.10	0.89	0.90	0.05	1.27	0.00	0.03	1.82	0.12	6.19
	2014	1.21	7.27	0.25	0.05	1.45	0.00	0.03	1.64	0.11	12.02
	2018	0.99	3.37	0.00	0.07	2.03	0.00	0.05	1.64	0.09	8.23
	2023	0.79	2.25	0.00	0.03	1.31	0.00	0.07	1.74	0.08	6.27
	2030	0.21	4.78	0.05	0.04	1.39	0.00	0.07	1.16	0.05	7.74
	2036	0.24	4.78	0.06	0.04	1.35	0.00	0.07	0.67	0.03	7.24
	2045	0.21	4.78	0.05	0.04	1.26	0.00	0.07	0.32	0.02	6.74
Sum of PM10	2008	0.76	3.87	1.74	0.48	4.58	0.00	0.09	2.50	0.16	14.19
	2012	1.16	0.96	0.98	0.07	1.83	0.00	0.07	1.96	0.13	7.16
	2014	1.25	7.92	0.27	0.09	2.65	0.00	0.07	1.76	0.12	14.13
	2018	1.02	3.65	0.00	0.10	3.19	0.00	0.12	1.77	0.09	9.96
	2023	0.81	2.44	0.00	0.08	2.67	0.01	0.16	1.87	0.09	8.12
	2030	0.22	5.18	0.06	0.08	2.88	0.01	0.17	1.22	0.06	9.87
	2036	0.25	5.18	0.07	0.08	2.87	0.01	0.17	0.69	0.03	9.35
	2045	0.23	5.18	0.05	0.08	2.78	0.01	0.17	0.32	0.02	8.83
Sum of PM10TW	2008				0.01	0.23	0.00	0.01			0.25
	2012				0.01	0.29	0.00	0.01			0.31
	2014	0.00	0.00	0.00	0.02	0.67	0.00	0.01	0.00	0.00	0.70
	2018				0.02	0.63	0.00	0.02			0.67
	2023		0.00	0.00	0.02	0.77	0.00	0.03	0.00	0.00	0.83
	2030		0.00	0.00	0.03	0.85	0.00	0.03	0.00	0.00	0.91
	2036		0.00	0.00	0.03	0.86	0.00	0.03	0.00	0.00	0.92
	2045		0.00	0.00	0.03	0.87	0.00	0.03	0.00	0.00	0.93
Sum of PM10BW	2008				0.01	0.39	0.00	0.07			0.47
	2012				0.01	0.51	0.00	0.05			0.57
	2014	0.00	0.00	0.00	0.03	1.15	0.00	0.05	0.00	0.00	1.24
	2018				0.03	1.08	0.00	0.10			1.22
	2023		0.00	0.00	0.04	1.33	0.00	0.13	0.00	0.00	1.50
	2030		0.00	0.00	0.04	1.46	0.00	0.14	0.00	0.00	1.65
	2036		0.00	0.00	0.05	1.48	0.00	0.14	0.00	0.00	1.67
	2045		0.00	0.00	0.05	1.49	0.00	0.14	0.00	0.00	1.68
Sum of SOx	2008	0.03	44.35	0.02	0.01	0.11	0.00	0.01	0.05	0.00	44.58
	2012	0.04	5.88	0.02	0.01	0.14	0.00	0.00	0.05	0.00	6.16
	2014	0.08	14.35	0.01	0.03	0.31	0.00	0.00	0.05	0.00	14.84
	2018	0.07	8.11	0.00	0.02	0.30	0.00	0.01	0.06	0.00	8.57
	2023	0.10	5.65	0.00	0.03	0.34	0.00	0.01	0.09	0.00	6.23
	2030	0.11	6.87	0.01	0.03	0.32	0.00	0.01	0.09	0.00	7.43
	2036	0.11	6.87	0.01	0.02	0.28	0.00	0.01	0.09	0.00	7.38
	2045	0.11	6.87	0.01	0.02	0.24	0.00	0.01	0.08	0.00	7.34
Sum of CO2	2008	5498.58	2824.82	1727.46	979.29	11330.99	36.99	619.02	4838.32	324.37	28179.83
	2012	8977.49	2684.38	2057.40	1259.35	14065.47	28.02	466.24	4829.40	348.78	34716.53
	2014	16462.98	24752.21	626.34	3244.47	31323.38	26.76	453.29	5161.76	402.39	82453.58
	2018	13649.49	12200.62	0.00	3122.62	29179.93	50.77	772.80	6131.77	380.73	65488.74
	2023	19600.00	8475.65	0.00	3805.71	32771.25	56.13	870.04	8847.72	446.52	74873.02
	2030	19933.50	10303.92	670.02	3624.65	30925.73	51.95	798.97	9265.73	443.63	76018.09
	2036	19950.53	10303.92	670.02	3167.03	27082.87	47.71	730.50	8758.95	439.16	71150.69
	2045	19964.62	10303.92	670.02	2741.51	23920.04	46.73	727.76	8061.64	439.10	66875.34
Sum of CH4	2008	0.40	0.02	0.04	0.12	0.55	0.02	0.03	0.39	0.03	1.61
	2012	0.81	0.02	0.04	0.03	0.13	0.01	0.02	0.39	0.03	1.48
	2014	1.74	0.56	0.01	0.06	0.21	0.01	0.01	0.42	0.03	3.06
	2018	1.70	0.17	0.00	0.06	0.25	0.01	0.01	0.50	0.03	2.74
	2023	7.31	0.07	0.00	0.04	0.06	0.01	0.01	0.72	0.04	8.24
	2030	11.84	0.10	0.01	0.04	0.04	0.01	0.00	0.75	0.04	12.83
	2036	11.83	0.10	0.01	0.04	0.03	0.00	0.00	0.71	0.04	12.77
	2045	11.68	0.10	0.01	0.04	0.03	0.00	0.00	0.65	0.04	12.55
Sum of N2O	2008	0.00	0.17	0.08	0.06	1.92	0.01	0.04	0.13	0.01	2.41
	2012	0.00	0.16	0.09	0.07	2.46	0.00	0.02	0.13	0.01	2.94
	2014	0.00	1.62	0.03	0.16	5.52	0.00	0.02	0.14	0.01	7.49
	2018	0.00	0.85	0.00	0.15	5.19	0.01	0.02	0.16	0.01	6.40
	2023	0.00	0.49	0.00	0.19	6.14	0.01	0.01	0.23	0.01	7.08
	2030	0.00	0.57	0.03	0.17	5.64	0.00	0.01	0.24	0.01	6.69
	2036	0.00	0.57	0.03	0.15	4.89	0.00	0.01	0.23	0.01	5.90
	2045	0.00	0.57	0.03	0.13	4.21	0.00	0.01	0.21	0.01	5.18
Sum of DPM	2008	0.48	2.83	1.74	0.46	3.96	0.00	0.00	2.50	0.16	12.15
	2012	0.76	0.89	0.98	0.04	0.93	0.00	0.00	1.96	0.13	5.69
	2014	0.54	7.21	0.27	0.03	0.77	0.00	0.00	1.76	0.12	10.70
	2018	0.43	3.15	0.00	0.05	1.36	0.00	0.00	1.77	0.09	6.85
	2023	0.35	1.92	0.00	0.01	0.52	0.00	0.00	1.87	0.09	4.76
	2030	0.18	4.68	0.06	0.01	0.53	0.00	0.00	1.22	0.06	6.72
	2036	0.21	4.68	0.07	0.01	0.48	0.00	0.00	0.69	0.03	6.17
	2045	0.19	4.68	0.05	0.01	0.39	0.00	0.00	0.32	0.02	5.65

Table B1-676. Peak hour Proposed Mitigated Scenario different type of PM10 emissions by Fuel Type and Source Category in lbs/hr

Source category	Fuel	Year	PM10exh,tire,brk	PM10fugdust	DPM
CHE	**Diesel**	2008	0.5		0.5
		2012	0.8		0.8
		2014	0.5	0.0	0.5
		2018	0.4		0.4
		2023	0.3		0.3
		2030	0.2		0.2
		2036	0.2		0.2
		2045	0.2		0.2
	LPG	2008	0.3		0.0
		2012	0.4		0.0
		2014	0.7	0.0	0.0
		2018	0.6		0.0
		2023	0.4		0.0
OGV	**MDO/MGO**	2008	3.9		2.8
		2012	1.0		0.9
		2014	7.9	0.0	7.2
		2018	3.6		3.1
		2023	2.4	0.0	1.9
		2030	5.2	0.0	4.7
		2036	5.2	0.0	4.7
		2045	5.2	0.0	4.7
Harbor Craft	**MDO/MGO**	2008	1.7		1.7
		2012	1.0		1.0
		2014	0.3	0.0	0.3
		2018	0.0		0.0
		2023	0.0	0.0	0.0
		2030	0.1	0.0	0.1
		2036	0.1	0.0	0.1
		2045	0.1	0.0	0.1
Onsite Trucks	**Diesel**	2008	0.5	0.6	0.5
		2012	0.1	0.7	0.0
		2014	0.1	1.6	0.0
		2018	0.1	0.0	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	2008	0.0	0.0	0.0
		2012	0.0	0.1	0.0
		2014	0.0	0.1	0.0
		2018	0.0	1.7	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	**LNG+Diesel**	2008	4.6	0.5	4.0
		2012	1.8	0.6	0.9
		2014	2.7	1.4	0.8
		2018	3.2	1.3	1.4
		2023	2.7	1.5	0.5
		2030	2.9	1.7	0.5
		2036	2.9	1.7	0.5
		2045	2.8	1.7	0.4
Onsite PC	**Diesel/Gas/Elec**	2008	0.0	0.0	0.0
		2012	0.0	0.0	0.0
		2014	0.0	0.0	0.0
		2018	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**	2008	0.1	0.1	0.0
		2012	0.1	0.1	0.0
		2014	0.1	0.1	0.0
		2018	0.1	0.2	0.0
		2023	0.2	0.2	0.0
		2030	0.2	0.3	0.0
		2036	0.2	0.3	0.0
		2045	0.2	0.3	0.0
Rail Offsite	**Diesel**	2008	2.5		2.5
		2012	2.0		2.0
		2014	1.8	0.0	1.8
		2018	1.8		1.8
		2023	1.9	0.0	1.9
		2030	1.2	0.0	1.2
		2036	0.7	0.0	0.7
		2045	0.3	0.0	0.3
Rail Onsite	**Diesel**	2008	0.2		0.2
		2012	0.1		0.1
		2014	0.1	0.0	0.1
		2018	0.1		0.1
		2023	0.1	0.0	0.1
		2030	0.1	0.0	0.1
		2036	0.0	0.0	0.0
		2045	0.0	0.0	0.0
Grand Total			**81.5**	**26.7**	**58.7**

Appendix B2

Air Dispersion Modeling

Contents

List of Tables

List of Figures

1.0 Introduction

This appendix describes the methods and results of air dispersion modeling that predict the ground-level concentrations of criteria pollutants from past and future operation of the China Shipping Terminal at Berths 97-109. The analysis modeled the following concentrations:

- 1-hour and annual nitrogen dioxide (NO_2);
- 1-hour and 24-hour sulfur dioxide (SO_2);
- 1-hour and 8-hour carbon monoxide (CO);
- 24-hour and annual particulate matter less than ten microns (PM_{10}); and
- 24-hour particulate matter less than 2.5 microns ($PM_{2.5}$).

The following two scenarios were analyzed:

- **Revised Project:** this scenario is the proposed Project for which this Supplemental EIR (SEIR) has been prepared. As described in Chapter 2 of the Recirculated Draft SEIR, the 2008 EIS/EIR for the China Shipping Terminal included a number of mitigation measures, some of which have yet to be fully implemented for various reasons. The Revised Project consists of continued future operation of the terminal under the new or modified mitigation measures described in Chapter 1 of the Final SEIR. Revised Project impacts were evaluated for future years 2023, 2030, 2036, and 2045. The analysis for the Revised Project also evaluated actual emissions associated with terminal operation in two past years (2012 and 2014) and the present year (2018).

- **FEIR Mitigated Scenario:** this scenario represents operation of the terminal as it would have been and would be with timely implementation of all 2008 EIS/EIR mitigation measures. The FEIR Mitigated Scenario was evaluated for the same past, present, and future analysis years as the Revised Project. Analysis of the FEIR Mitigated Scenario is provided for informational purposes to compare to the Revised Project.

For more details about the baseline and scenarios, see Section 2.0 in Appendix B1.

Air quality impacts of the two Project scenarios described above were analyzed relative to a 2008 Actual Baseline, which represents the actual emissions associated with terminal operation in 2008. As discussed in Section 3.1.4.2 of the Recirculated Draft SEIR, the terminal was in compliance with applicable 2008 EIS/EIR mitigation measures during the 2008 Actual Baseline year.

Due to improvements in procedures and assumptions used to calculate emissions and in atmospheric dispersion modeling procedures used to estimate resulting pollutant concentrations, it is not possible to directly compare air quality impacts presented in the 2008 Final EIS/EIR with impacts calculated for this Final SEIR, nor is it possible to reproduce the outdated methods, models, and procedures used to analyze air quality impacts in the 2008 EIS/EIR. Therefore, this appendix presents an evaluation of air quality impacts using current, state-of-the-art emission estimation and air quality modeling procedures. The emission estimation procedures are described more fully in Appendix B1.

The air dispersion modeling was performed using the U.S. Environmental Protection Agency's (USEPA's) AERMOD Modeling system, version 18081 (USEPA, 2018). The modeling methodology was based on the USEPA's *Guideline on Air Quality Models* (USEPA, 2017) and the South Coast Air Quality Management District's (SCAQMD's) Modeling Guidance for AERMOD (SCAQMD, 2018). Ambient concentrations of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ were modeled for the scenarios and 2008 Actual Baseline. The maximum predicted impacts for the Project scenarios were compared to the relevant SCAQMD air quality significance thresholds.

Updates related to fine grid dispersion modeling

Six fine-grid dispersion model runs that were not performed for the Recirculated Draft SEIR were modeled for the Final SEIR. As a result, several NO_2 concentrations have been revised to slightly higher values and their locations have moved slightly. The revised tables and figures are included in the Final SEIR. All of the concentrations to which revisions have been made would remain well below the significance thresholds. Therefore, this revision would not change any of the significance findings in the Recirculated Draft SEIR.

2.0 Estimation of Emissions Used in the Air Dispersion Modeling

2.1 Emission Source Identification

The following operational emission sources were modeled in AERMOD:

- Container ships transiting between the SCAQMD overwater boundary and the terminal (about 40 nautical miles), anchoring while waiting for an available berth, and hoteling while at berth. Ship emission sources include propulsion engines, auxiliary engines, and boilers.
- Tugboats used to assist ships while arriving and departing the Port. Tugboat emission sources include propulsion and auxiliary engines.
- Locomotives performing switching activities at the on-dock rail yard; and line-haul locomotives moving and idling at the on-dock rail yard, and hauling trains to and from the yard. Locomotive emission sources include engine exhaust.
- Cargo handling equipment working both on-terminal and handling China Shipping-related containers at the on-dock rail yard. Cargo handling equipment emission sources include engine exhaust.
- Trucks idling at the in-gate, out-gate, and on-terminal; driving on-terminal; and driving off-terminal along the primary truck routes. Truck emission sources include engine exhaust, tire wear, brake wear, and road dust.
- Worker vehicles driving both on- and off-terminal. Worker vehicle emission sources include engine exhaust, tire wear, brake wear, and road dust.

2.2 Derivation of Emissions for the Pollutant Averaging Periods

Section 3.1.4.1 of the Recirculated Draft SEIR and Appendix B1 describe the methodology for estimating annual, peak day, peak 8-hour, and peak 1-hour emissions associated with terminal operations. In general, peak day emissions were calculated for each source category (container ships, tugboats, locomotives, cargo handling equipment, trucks, and worker vehicles) based on expected maximum daily activity levels within the annual period being modeled. Peak 1-hour and 8-hour emissions for cargo handling equipment, trucks, and worker vehicles were calculated internally by AERMOD based on the assumption that the peak daily source emissions follow the time-of-day profiles listed in Table B2-2. Peak 1-hour and 8-hour emissions for container ships, tugboats, and locomotives were calculated outside of AERMOD as described in Appendix B1 and modeled directly in AERMOD.

3.0 Dispersion Modeling Approach

3.1 Dispersion Model Selection and Inputs

Air dispersion modeling was performed using the USEPA AERMOD dispersion model, version 18081 (USEPA, 2018), based on the *Guideline on Air Quality Models* (USEPA, 2017) and SCAQMD Modeling Guidance for AERMOD (SCAQMD, 2018). AERMOD is a steady-state, multiple source, Gaussian dispersion model designed for applications which include areas of ground elevations that exceed emission source stack heights. AERMOD is well suited for this analysis because it is (1) accepted by the modeling community and regulatory agencies due to of its ability to provide reasonable results for large industrial projects with multiple emission sources, (2) annual sets of hourly meteorological data are available in AERMOD format, and (3) the model can handle various sources types, including point, area, line, and volume. Finally, AERMOD has been approved by the USEPA and SCAQMD for analysis of mobile sources.

3.1.1 Emission Source Modeling Representation

Operational emission sources were represented in AERMOD as follows:

- Container ships in transit were simulated as a series of separated volume sources extending from Berths 100 and 102 to the South Coast Air Basin (SCAB) overwater boundary. Volume source spacing was 100 meters within the harbor, 500 meters in the precautionary zone, 1,000 meters between the precautionary zone and 20 nautical miles from Point Fermin, and 2,000 meters between 20 nautical miles and the SCAB overwater boundary. Transit emissions were apportioned 75 percent to the north trans-Pacific route, and 25 percent to the west route, based on arrival and departure statistics for the terminal (Ramboll Environ, 2016).
- Container ships at berth were modeled as point sources located adjacent to Berths 100 and 102.
- Container ships at anchorage were modeled as an area source within the harbor.

- Tugboats were modeled as a series of separated volume sources extending from Berths 100 and 102 to the Port breakwater. The volume source spacing was 100 meters.
- Locomotives were modeled as a series of contiguous line sources along the arriving and departing routes as well as within the on-dock rail yard. Locomotives were modeled as far north as Sepulveda Blvd, about 4.5 miles northeast of the terminal. A sensitivity AERMOD run showed that this range was sufficient to adequately capture maximum pollutant concentrations.
- Cargo handling equipment was modeled as area sources positioned over most of the terminal and the on-dock rail yard.
- Trucks driving and idling on-site were modeled as area sources positioned over the in-gate, out-gate, and terminal.
- Trucks and worker vehicles driving off-site were modeled a series of contiguous line sources along the primary travel routes. They were modeled as far north as Sepulveda Blvd, about 4.5 miles northeast of the terminal. A sensitivity AERMOD run showed that this range was sufficient to adequately capture maximum pollutant concentrations.
- Worker vehicles on-site were modeled as area sources positioned over the entrance roads and on-terminal parking lots.

Table B2-1 presents the source parameters used in the dispersion modeling of operational emissions. The source parameters are consistent with those developed and used in prior LAHD NEPA/CEQA documents for container terminals, including the 2008 EIS/EIR for the China Shipping Terminal (LAHD 2008; LAHD 2011; LAHD 2014). The locations of the emission sources as modeled are shown in Figures B2-1 through B2-3.

Table B2-1. AERMOD Source Parameters

Source Description	AERMOD Source Type	Release Height (m) [a]	Initial Vertical Dimension (m) [b]	Stack Exit Velocity (m/s)	Stack Exit Temp. (K)	Stack Inside Diameter (m)
Ships – Fairway and Precautionary Area Transit	Volume	49.1	11.4	--	--	--
Ships – Harbor Transit	Volume	59.1	13.7	--	--	--
Ships – Turning and Docking Near-Berth	Volume	78.6	18.3	--	--	--
Ships - At Berth - Auxiliary Engines	Point	44.5	--	7.5	583	0.539
Ships - At Berth – Boilers	Point	39.9	--	18.24	559	0.494
Ships - At Anchorage	Area	44.5	10.3	--	--	--
Tugboats	Volume	15.2	3.5	--	--	--
Locomotives - Offsite – Day [c]	Line	5.6	2.6	--	--	--
Locomotives - Offsite – Night	Line	14.6	6.79	--	--	--
Locomotives - Onsite – Day	Line	6.64	3.08	--	--	--
Locomotives - Onsite – Night	Line	13.56	6.31	--	--	--
Cargo Handling Equipment (except RTGs)	Area	4.57	1.06	--	--	--
Rubber Tired Gantry (RTG) Cranes	Area	12.5	2.9	--	--	--
Trucks	Area, Line [d]	4.57	1.06	--	--	--
Worker Vehicles	Area, Line [d]	0.61	0.14	--	--	--

Notes:

a. The release height for point sources in this table represents the actual release height of the exhaust above ground (or water, in this case). AERMOD then accounts for additional plume rise due to the upward momentum and buoyancy of the stack exhaust gas, based on the exit velocity, exit temperature, and stack diameter. By contrast, AERMOD does not calculate any additional plume rise for volume, area, and line sources. Therefore, the release heights presented in this table for volume, area, and line sources have been adjusted higher than the actual exhaust release heights in many cases to account for plume rise due to upward momentum and buoyancy of the stack exhaust gas.

b. The initial vertical dimension of the plume (σ_z) was determined by dividing the initial vertical thickness by 4.3 for elevated releases and by 2.15 for ground-based releases.

c. Locomotive plume heights were derived from the *Roseville Rail Yard Study* (CARB, 2004). The plume heights vary by day versus night due to differences in atmospheric stability conditions. The line source release heights were set equal to the plume heights because line sources do not have a plume rise algorithm in AERMOD.

d. Trucks and worker vehicles were modeled with area sources on-site and line sources off-site.

e. Source parameters are consistent with prior LAHD CEQA documents for container terminals (LAHD 2008; LAHD 2011; LAHD 2014).

Figure B2-1. AERMOD Source Representation – Ship (OGV) Transits

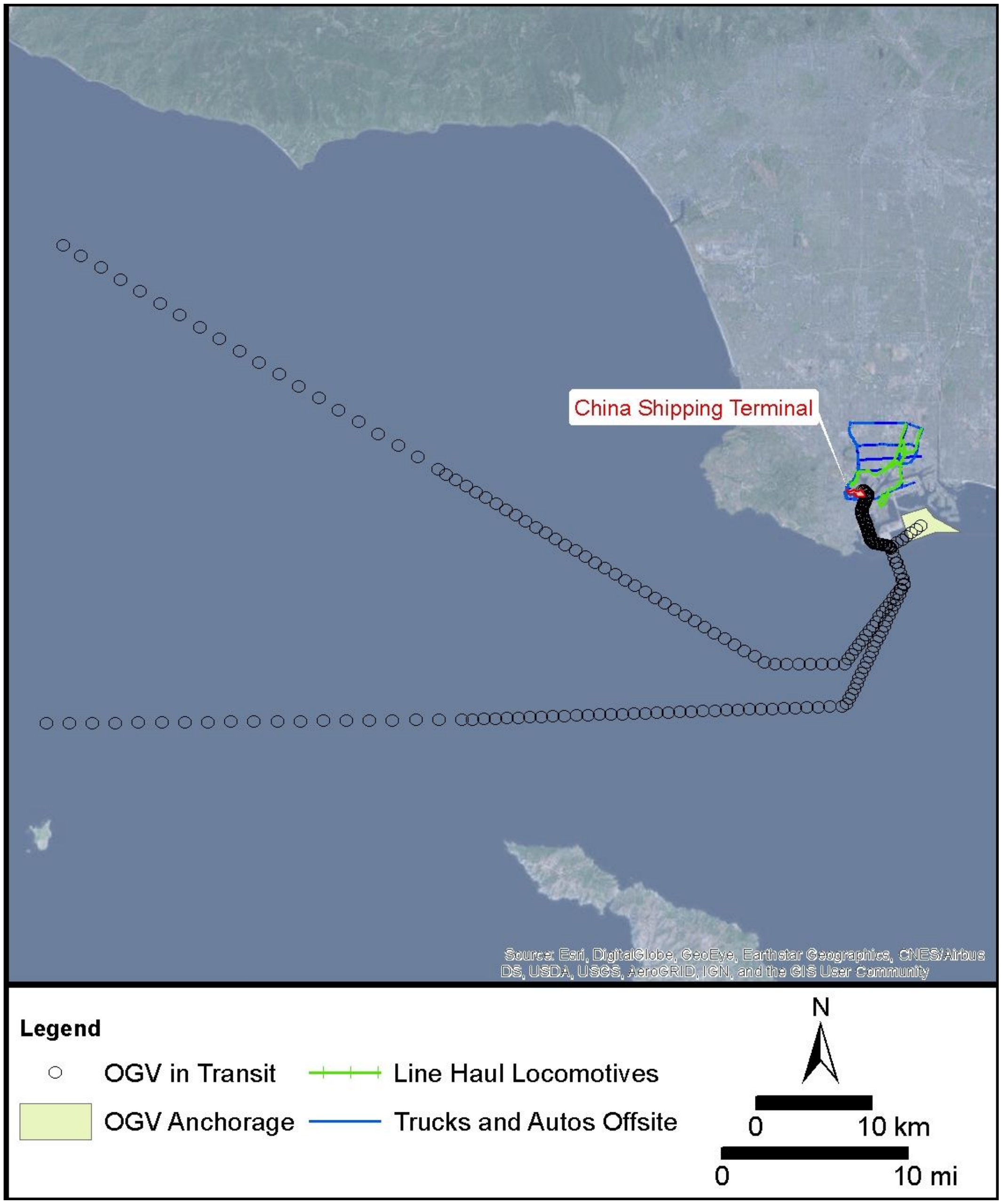


Figure B2-2. AERMOD Source Representation – OGV Maneuvering and Anchorage, Off-site Line Haul Locomotives, and Off-site Trucks and Worker Vehicles

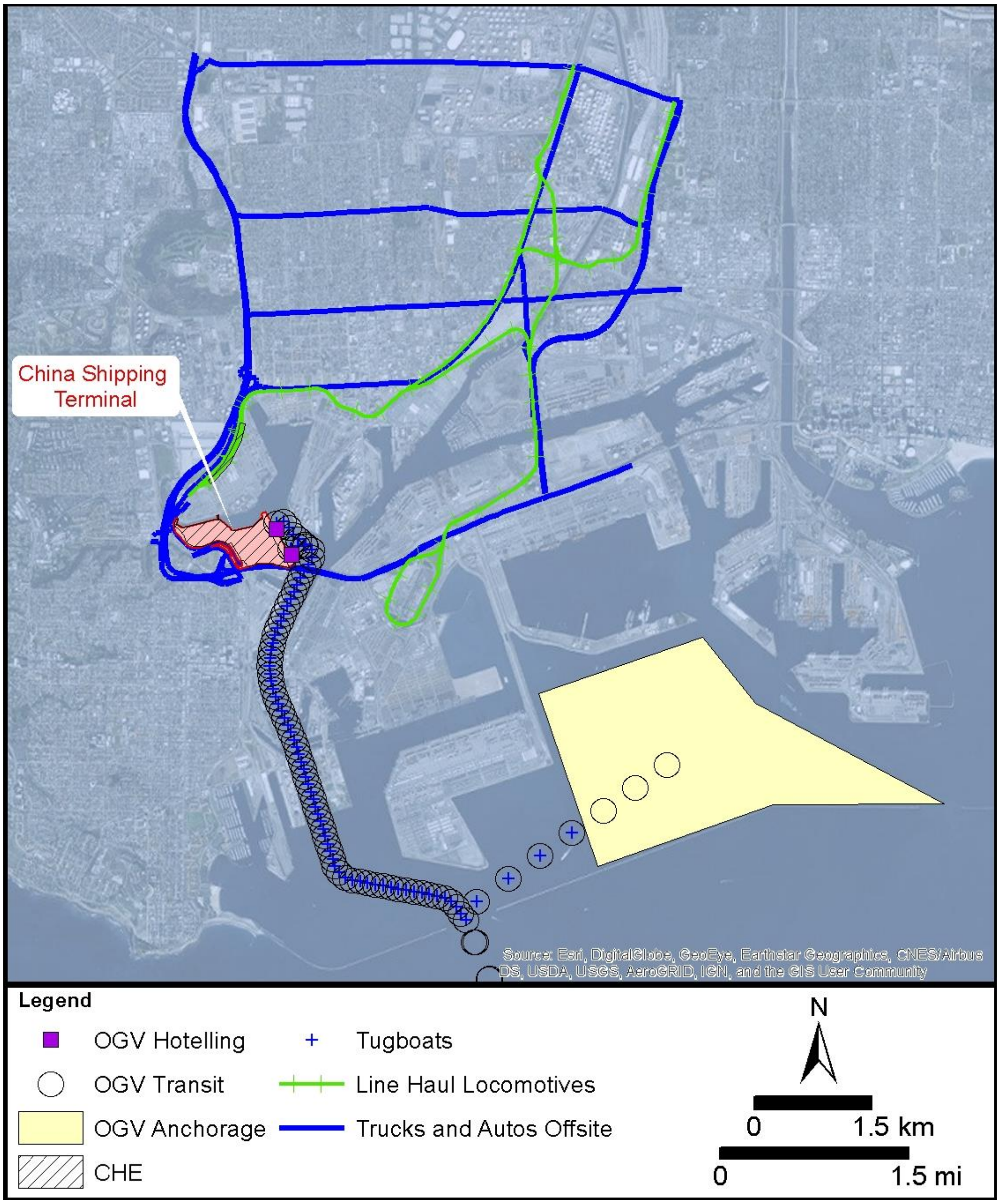
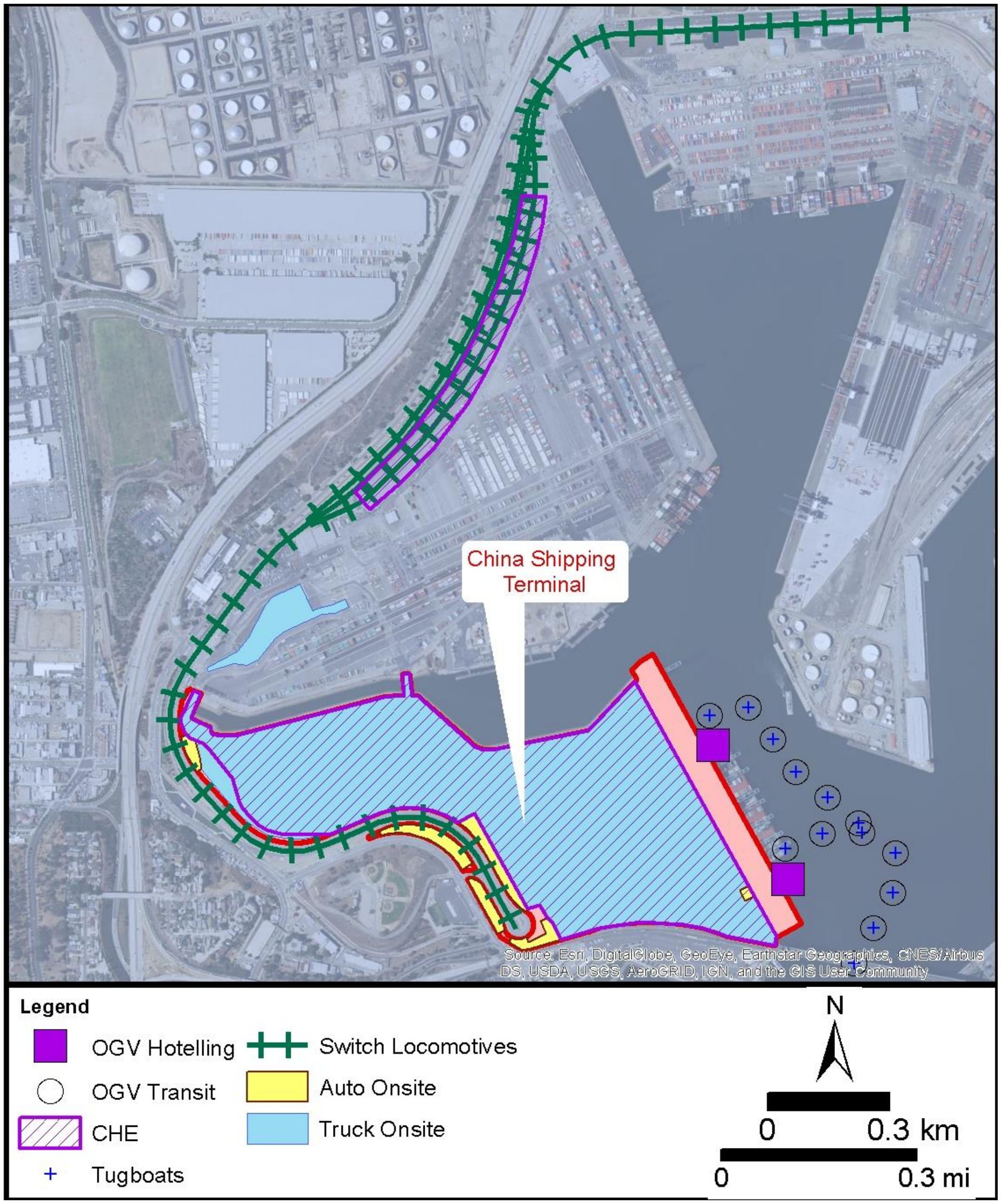


Figure B2-3. AERMOD Source Representation – OGV Hoteling, Cargo Handling Equipment (CHE), On-site Trucks and Worker Vehicles, and Switch Locomotives



3.1.2 Meteorological Data

The complex interaction of the ocean, land, and Palos Verdes hills near the Port may result in significant variations in wind patterns over relatively short distances (LAHD 2010). POLA and POLB currently operate monitoring stations that collect meteorological data from several locations within and near port boundaries. For this dispersion analysis, the meteorological data collected at the Wilmington Community Station, located at Saints Peter and Paul School, were used for dispersion modeling. The station is located about 1.6 mile north-northeast of the China Shipping terminal and is considered the most representative meteorological station for the terminal in accordance with the "Sphere of Influence" analysis conducted by POLA and POLB in 2010 (LAHD 2010).

The meteorological data used in AERMOD were collected between September 2006 and August 2007, the first complete 12-month period recorded at all six of the site-specific monitoring stations operated by the Ports of Los Angeles and Long Beach. The use of one year of meteorological data is consistent with USEPA guidelines, which state that "at least one year of site-specific" data are required" (USEPA, 2017). For project-to-project consistency, this same meteorological period has been used in numerous POLA and POLB EIRs since 2007.

The meteorological data were processed in 2013 using the USEPA's approved AERMET (version 12345) meteorological data preprocessor (USEPA, 2018b). To promote project-to-project consistency, the Ports reprocess the data with updated versions of AERMET only when necessary, such as when a new version of AERMET is different enough to substantially affect the AERMOD results for the Port projects. A review of USEPA-prepared test cases for various versions of AERMET and AERMOD (USEPA, 2018c) confirmed that the differences between AERMET versions 12345 and 18081 would have a negligible effect on the AERMOD-predicted concentrations for the types of sources modeled in this report. Therefore, the meteorological data processed with AERMET 12345 was used for this analysis. Moreover, as part of the data processing effort, the 2006-2007 meteorological data were compared to the more recent meteorological data collected during years 2009 to 2012. It was determined that the 2006-2007 data period is representative in comparison to the 2009 to 2012 data period. The evaluation showed that the average wind speed and wind patterns of the original data period are very similar to that of the 2009 to 2012 data period across the stations at both POLA and POLB. Therefore, it was concluded that the original data period is representative (ENVIRON 2013).

3.1.3 Model Options

Regulatory default technical options were selected in AERMOD for all pollutants. Consistent with SCAQMD and EPA guidance (SCAQMD, 2018; USEPA, 2010; USEPA, 2011a; USEPA, 2014; USEPA, 2017), the conversion of nitrogen oxide (NO_X) to NO_2 in ambient air was simulated in AERMOD using the Ozone Limiting Method (OLM). The following in-stack NO_2/NO_X ratios were assumed: 0.1 for container ship propulsion engines and boilers (derived from USEPA, 2000); 0.11 for diesel heavy-duty trucks (CAPCOA, 2011); 0.25 for worker vehicles (CAPCOA, 2011); and 0.20 for all other diesel internal combustion engines, including ship auxiliary engines, tugboats, locomotives, and cargo handling equipment (CAPCOA, 2011). For the OLM, AERMOD used hourly ambient ozone concentration data from the SCAQMD's North Long Beach monitoring station.

As recommended by the SCAQMD (2018), all sources were modeled with urban dispersion coefficients. An urban population of 9,818,605, representative of Los Angeles County, was used in AERMOD. Receptor and source base elevations were determined from USGS 1/3-arcsecond National Elevation Dataset (NED) files using AERMAP, version 18081 (USEPA 2018d). All coordinates were referenced to UTM NAD83, Zone 11.

3.1.4 Temporal Distribution Assumptions

For dispersion modeling purposes, operational emissions were assumed to occur during the times specified in Table B2-2. Emissions were assumed to be uniformly distributed during the specific time periods described in the table. The same temporal distribution assumptions were used for the FEIR Mitigated, Revised Project and 2008 Actual Baseline.

Table B2-2. Temporal Distribution of Emissions in AERMOD

Source Description	Temporal Distribution	
Container Ships	24 hours per day	
Tugboats	24 hours per day	
Locomotives	24 hours per day	
Cargo Handling Equipment [a]	10.0 percent 12 a.m. – 6 a.m. 25.0 percent 6 a.m. – 12 p.m. 32.5 percent 12 p.m. – 6 p.m. 32.5 percent 6 p.m. – 12 a.m.	
Trucks [b]	4.46 percent 12 a.m. – 1 a.m. 3.50 percent 1 a.m. – 2 a.m. 1.33 percent 2 a.m. – 3 a.m. 0.38 percent 3 a.m. – 4 a.m. 0.38 percent 4 a.m. – 5 a.m. 0.42 percent 5 a.m. – 6 a.m. 0.46 percent 6 a.m. – 7 a.m. 1.13 percent 7 a.m. – 8 a.m. 5.38 percent 8 a.m. – 9 a.m. 6.08 percent 9 a.m. – 10 a.m. 6.00 percent 10 a.m. – 11 a.m. 6.38 percent 11 a.m. – 12 p.m.	5.21 percent 12 p.m. – 1 p.m. 7.04 percent 1 p.m. – 2 p.m. 6.67 percent 2 p.m. – 3 p.m. 6.21 percent 3 p.m. – 4 p.m. 4.54 percent 4 p.m. – 5 p.m. 2.63 percent 5 p.m. – 6 p.m. 5.96 percent 6 p.m. – 7 p.m. 6.25 percent 7 p.m. – 8 p.m. 5.63 percent 8 p.m. – 9 p.m. 5.25 percent 9 p.m. – 10 p.m. 3.54 percent 10 p.m. – 11 p.m. 5.21 percent 11 p.m. – 12 a.m.
Worker Vehicles	Same distribution as trucks	

Notes:
[a] The temporal distribution for cargo handling equipment was derived from the truck distribution since a correlation exists between cargo handling and drayage truck visits. The truck factors were grouped into four 6-hour blocks to give less hour-by-hour variability than trucks because of a more steady-state workforce operating the cargo handling equipment.
[b] The temporal distribution for trucks was provided by the traffic study.

3.1.5 Receptor Locations

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the Project area to assess ground-level pollution concentrations, identify the extent of impacts, and identify maximum impact locations. Initial AERMOD runs were conducted with a 22 by 12 kilometer (km) coarse grid, with receptors placed 1,000 meters (m) apart, centered over the Project site. Embedded within this receptor grid were additional receptors, placed 500 m apart, covering an area 9 km x 12 km. Also embedded were additional receptors, placed 250 m apart, covering an area 7.5 km x 10.5 km in which maximum concentrations were anticipated to occur.

Once the locations of the maximum concentrations were identified on the aforementioned coarse grid, additional AERMOD runs were conducted with grids of receptors, placed 50 m apart, centered over locations of the maximum coarse grid concentrations and along the China Shipping Terminal boundary. Receptors over water and in modeled roadway and rail traffic lanes were not considered in determining the maximum receptor locations because any human exposure there would be brief and transient.

Figures B2-4 and B2-5 show the receptor grids used in AERMOD for criteria pollutants.

Figure B2-4. AERMOD Fine and Coarse Grid Receptors (Far Field)

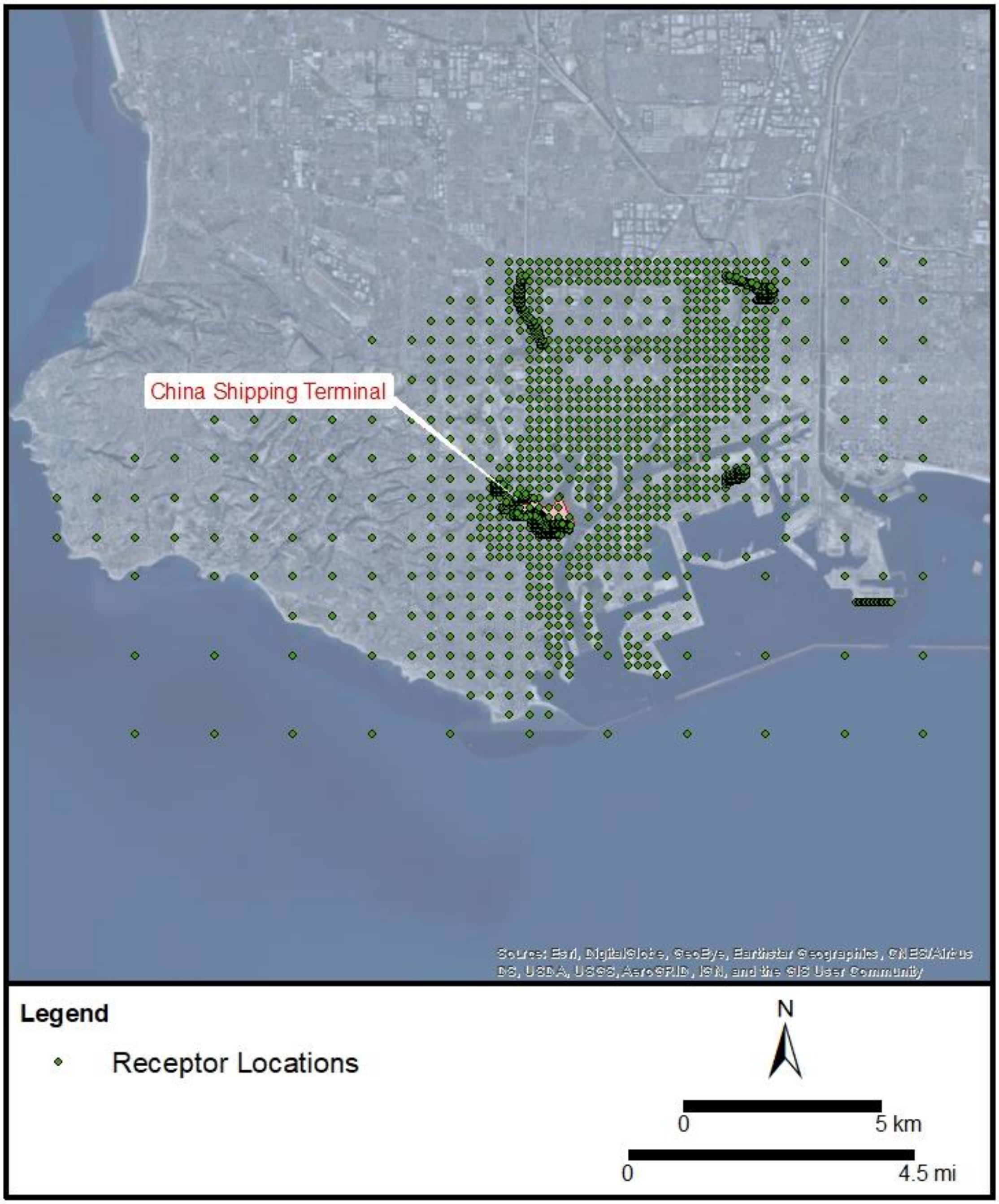
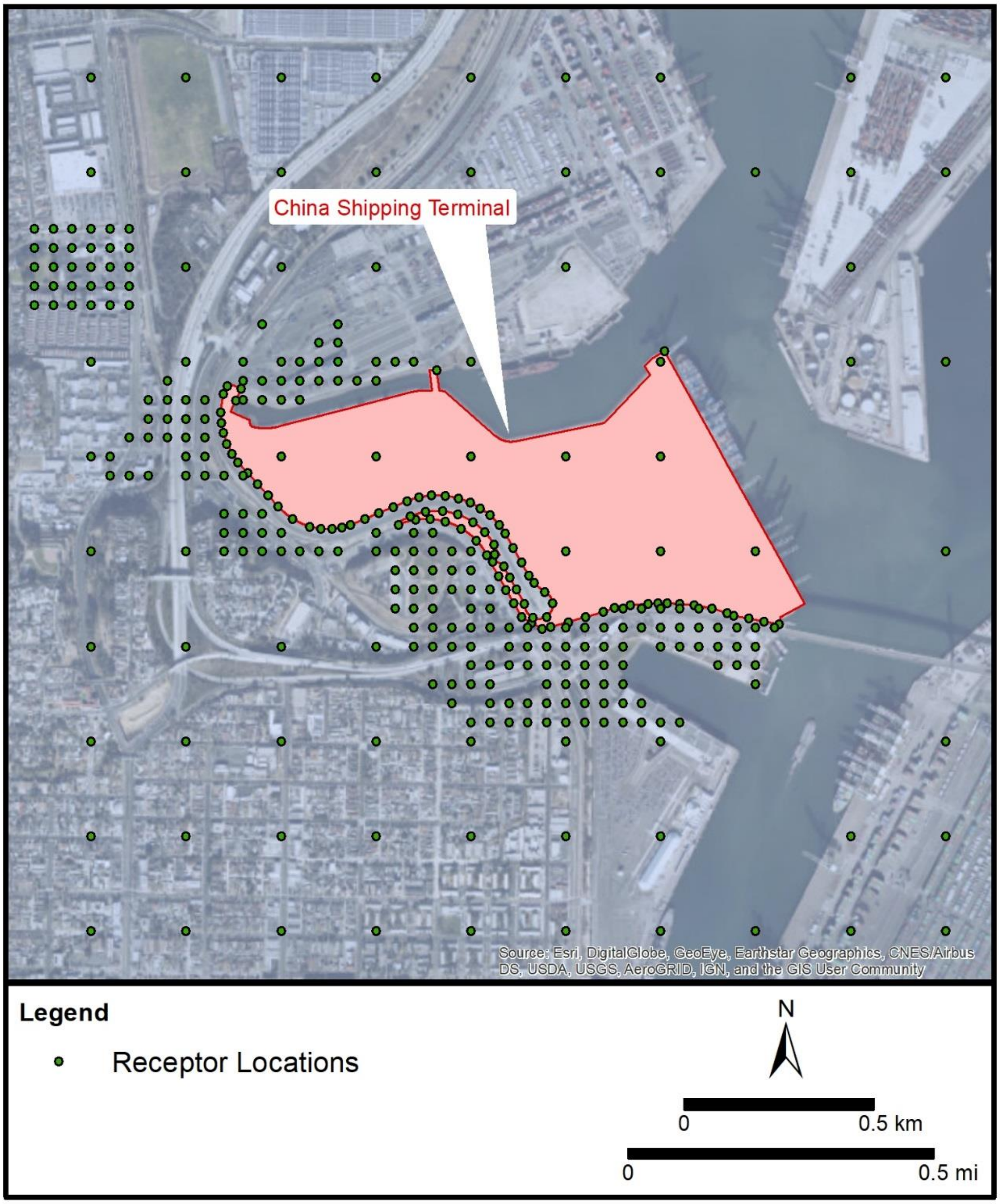


Figure B2-5. AERMOD Fine and Coarse Grid Receptors (Near Field)



3.2 Methodology for Determination of Impacts

NO_2, PM_{10} and $PM_{2.5}$ concentrations associated with the Revised Project and FEIR Mitigated Scenario were modeled for each analysis year (2012, 2014, 2018, 2023, 2030, 2036, and 2045). Because prior Port projects have shown that SO_2 and CO are unlikely to exceed the significance thresholds, a conservative screening approach was used for SO_2 and CO where each AERMOD source was modeled with its maximum emissions over all analysis years. Thus, single worst case emission scenarios were modeled for CO and SO_2, whereas individual analysis years were modeled for NO_2, $PM_{2.5}$ and PM_{10}. The pollutant concentrations modeled by AERMOD were compared to the significance thresholds in Table B2-3 to assess impacts.

3.2.1 Methodology for NO_2, SO_2, and CO

The significance concentration thresholds for NO_2, SO_2, and CO are absolute thresholds based on the ambient air quality standards. Therefore, modeled Project concentration increments were added to ambient background concentrations to yield total concentrations. The modeled Project concentration increment is the modeled pollutant concentration under Project conditions minus the modeled pollutant concentration under 2008 Actual Baseline conditions, determined at each modeled receptor. The background concentration represents the maximum ambient concentration in the vicinity of the Project site, excluding the incremental contribution from the Revised Project or FEIR Mitigated Scenario. This approach for determining total concentrations was endorsed by the SCAQMD (SCAQMD 2012a and SCAMQD 2012b). Significance was determined by comparing the modeled receptors with the greatest total concentrations to the significance thresholds.

Ambient background concentrations were obtained from the Port's Wilmington Community Station at Saints Peter and Paul School. This air monitoring station is part of the Port's site-specific monitoring network, and therefore captures the contributions to ambient air pollutant levels from the Port including the China Shipping Terminal. The three most recent years of monitoring data, 2015-2017, were used to determine the background concentrations for the modeled analysis years 2018 through 2045. For analysis years 2012 and 2014, the three years of monitoring data leading up to and including the analysis years were used to determine the background concentrations. Therefore, 2010-2012 monitoring data were used for analysis year 2012, and 2012-2014 monitoring data were used for analysis year 2014. Tables B2-4, B2-5, and B2-6 show the derivation of the background concentrations used in this analysis.

To be consistent with the federal 1-hour NO_2 standard, the modeled federal 1-hour NO_2 concentrations represent the 98th percentile (8th highest) of the annual distribution of daily maximum 1-hour concentrations. Although compliance with the federal 1-hour NO_2 standard is based on a three-year average of the 98th percentile 1-hour concentrations, the EPA states that the use of one or more years of available site specific meteorological data serves as an unbiased estimate of the 3-year average for purposes of modeling demonstrations of compliance with the NAAQS (EPA, 2010). All other modeled pollutant concentrations, including the state 1-hour NO_2 concentration, represent the highest concentrations over the entire year of meteorological data.

3.2.2 Methodology for PM_{10} and $PM_{2.5}$

The significance concentration thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds. Therefore, the modeled Project concentration increments (Project minus 2008 Actual Baseline) were compared directly to the thresholds without adding background concentrations. Significance was determined by comparing the modeled receptors with the greatest increments to the thresholds.

Table B2-3: SCAQMD Significance Thresholds for Operations

Air Pollutant	Operation Ambient Concentration Threshold
Nitrogen Dioxide (NO_2)[a]	
1-hour average (federal)[b]	0.100 ppm (188 µg/m^3)
1-hour average (state)	0.18 ppm (339 µg/m^3)
Annual average (federal)[c]	0.0534 ppm (100 µg/m^3)
Annual average (state)	0.030 ppm (57 µg/m^3)
Sulfur Dioxide (SO_2)[a]	
1-hour average (federal)[d]	0.075 ppm (196 µg/m^3)
1-hour average (state)	0.250 ppm (655 µg/m^3)
24-hour average	0.040 ppm (105 µg/m^3)
Carbon Monoxide (CO)[a]	
1-hour average	20 ppm (23,000 µg/m^3)
8-hour average	9.0 ppm (10,000 µg/m^3)
Particulates (PM_{10} or $PM_{2.5}$)[e]	
24-hour average (PM_{10} and $PM_{2.5}$)	2.5 µg/m^3
Annual average (PM_{10} only)	1.0 µg/m^3

Notes:

[a] The NO_2, SO_2, and CO thresholds are absolute thresholds; the maximum predicted Project impact is added to the background concentration and compared to the threshold.

[b] This analysis included the use of both the current SCAQMD NO_2 threshold (0.18 ppm), which is the state standard, and the newer federal 1-hour ambient air quality standard (0.100 ppm). To attain the federal standard, the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour averages at a receptor must not exceed 0.100 ppm.

[c] For the purpose of determining significance, the more stringent annual state NO_2 standard of 57 µg/m^3 was used in instead of the higher annual federal standard.

[d] To attain the SO_2 federal 1-hour standard, the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm. This analysis conservatively used the highest modeled 1-hour SO_2 concentration.

[e] The PM_{10} and $PM_{2.5}$ thresholds are incremental thresholds; the maximum Project impact relative to the 2008 Actual Baseline is compared to these thresholds without adding a background concentration.

Sources:

SCAQMD 2015; USEPA 2017b.

Table B2-4. Background Concentrations Measured at the Wilmington Community Station for Analysis Year 2012

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2010	2011	2012	(ppm)	(μg/m^3) [e]
NO_2	State 1-Hour	0.098	0.091	0.078	0.098	185
	Federal 1-Hour [b]	0.079	0.080	0.062	0.074	139
	Annual	0.021	0.021	0.016	0.021	40
CO	1-Hour	4.6	5.0	4.7	5.0	5,740
	8-Hour	2.7	3.0	2.5	3.0	3,444
SO_2	State 1-Hour	0.046	0.029	0.028	0.046	121
	Federal 1-Hour [c]	0.030	0.024	0.016	0.023	61
	24-Hour	0.009	0.009	0.006	0.009	24

Notes:

a. All reported values represent the highest observed concentration during the year unless otherwise noted.

b. The federal 1-hour NO_2 concentration for each year represents the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

c. The federal 1-hour SO_2 concentration for each year represents the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

d. The background concentrations for federal 1-hour NO_2 and SO_2 are averages of the three reported years. The background concentrations for all other pollutants and averaging periods are maximums of the three reported years.

e. The concentration in micrograms per cubic meter (μg/m^3) is calculated as follows: μg/m^3 = ppm x MW / 0.0244. The molecular weights (MW) are 28.01 for CO, 46.0055 for NO_2, and 64.066 for SO_2.

f. Source: POLA, 2018. The years reported in this table represent the following 12-month observation periods: Year 2010 represents May 2010 - April 2011, Year 2011 represents May 2011 - April 2012, and Year 2012 represents May 2012 - April 2013.

Table B2-5. Background Concentrations Measured at the Wilmington Community Station for Analysis Year 2014

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2012	2013	2014	(ppm)	(μg/m^3) [e]
NO_2	State 1-Hour	0.078	0.092	0.085	0.092	173
	Federal 1-Hour [b]	0.062	0.074	0.066	0.067	127
	Annual	0.016	0.018	0.017	0.018	34
CO	1-Hour	4.7	4.0	3.8	4.7	5,395
	8-Hour	2.5	2.9	2.5	2.9	3,329
SO_2	State 1-Hour	0.028	0.050	0.027	0.050	131
	Federal 1-Hour [c]	0.016	0.015	0.018	0.016	43
	24-Hour	0.006	0.006	0.005	0.006	16

Notes:

a. All reported values represent the highest observed concentration during the year unless otherwise noted.

b. The federal 1-hour NO_2 concentration for each year represents the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

c. The federal 1-hour SO_2 concentration for each year represents the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

d. The background concentrations for federal 1-hour NO_2 and SO_2 are averages of the three reported years. The background concentrations for all other pollutants and averaging periods are maximums of the three reported years.

e. The concentration in micrograms per cubic meter (μg/m^3) is calculated as follows: μg/m^3 = ppm x MW / 0.0244. The molecular weights (MW) are 28.01 for CO, 46.0055 for NO_2, and 64.066 for SO_2.

f. Source: POLA, 2018. The years reported in this table represent the following 12-month observation periods: Year 2012 represents May 2012 - April 2013, Year 2013 represents May 2013 - April 2014, and Year 2014 represents May 2014 - April 2015.

Table B2-6. Background Concentrations Measured at the Wilmington Community Station for Analysis Years 2018-2045

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2015	2016	2017	(ppm)	(μg/m^3) [e]
NO_2	State 1-Hour	0.086	0.087	0.076	0.087	164
	Federal 1-Hour [b]	0.064	0.066	0.066	0.065	123
	Annual	0.017	0.015	0.013	0.017	32
CO	1-Hour	3.9	3.4	3.8	3.9	4,477
	8-Hour	2.4	2.2	2.3	2.4	2,755
SO_2	State 1-Hour	0.04	0.038	0.052	0.052	137
	Federal 1-Hour [c]	0.018	0.016	0.019	0.018	46
	24-Hour	0.005	0.004	0.009	0.009	24

Notes:

a. All reported values represent the highest observed concentration during the year unless otherwise noted.

b. The federal 1-hour NO_2 concentration for each year represents the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

c. The federal 1-hour SO_2 concentration for each year represents the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

d. The background concentrations for federal 1-hour NO_2 and SO_2 are averages of the three reported years. The background concentrations for all other pollutants and averaging periods are maximums of the three reported years.

e. The concentration in micrograms per cubic meter (μg/m^3) is calculated as follows: μg/m^3 = ppm x MW / 0.0244. The molecular weights (MW) are 28.01 for CO, 46.0055 for NO_2, and 64.066 for SO_2.

f. Source: POLA, 2018. The years reported in this table represent the following 12-month observation periods: Year 2015 represents May 2015 - April 2016, Year 2016 represents May 2016 - April 2017, and Year 2017 represents May 2017 - April 2018.

3.3 Predicted Air Quality Impacts

3.3.1 Revised Project

Table B2-7 presents the maximum off-site NO_2 concentration impacts associated with the Revised Project in each analysis year. Results show that impacts would exceed the federal 1-hour NO_2 significance threshold in 2014 and 2018, the state 1-hour NO_2 threshold in 2014, and the annual NO_2 threshold in 2014 and 2018.

Table B2-8 presents the maximum off-site SO_2 and CO concentration impacts associated with the Revised Project. Because prior Port projects have shown that SO_2 and CO are unlikely to exceed the significance thresholds, a conservative screening approach was used for SO_2 and CO where each AERMOD source was modeled with its maximum emissions over all analysis years. The screening results show that impacts would be below the SO_2 and CO significance thresholds in all analysis years.

Table B2-9 presents the maximum off-site PM_{10} and $PM_{2.5}$ concentration increments associated with the Revised Project in each analysis year. Results show that impacts would exceed the 24-hour and annual PM_{10} significance thresholds in 2014, 2018, 2023, 2030, 2036, and 2045. Impacts would be below the $PM_{2.5}$ significance thresholds in all analysis years.

Table B2-7. Maximum Off-Site Ambient NO_2 Concentrations Associated with the Revised Project

Pollutant	Averaging Period	Analysis Year	Background Concentration (μg/m^3)[c]	Maximum Modeled Project Concentration Increment (μg/m^3)[d,~~f~~]	Total Concentration (μg/m^3)[a,e]	Significance Threshold (μg/m^3)	Threshold Exceeded?
NO_2[b]	Federal 1-hour	2012	139	40.3	179	188	No
		2014	127	158.9	286	188	Yes
		2018	123	108.7	232	188	Yes
		2023	123	17.8~~15.6~~	141~~139~~	188	No
		2030	123	11.6	135	188	No
		2036	123	4.3	127	188	No
		2045	123	0.7~~< 0~~	124~~123~~	188	No
	State 1-hour	2012	185	44.4	229	339	No
		2014	173	169.6	343	339	Yes
		2018	164	119.2	283	339	No
		2023	164	19.9	184	339	No
		2030	164	13.0	177	339	No
		2036	164	5.1	169	339	No
		2045	164	2.1~~1.2~~	166~~165~~	339	No
	Annual	2012	40	11.6	52	57	No
		2014	34	31.7	66	57	Yes
		2018	32	25.2	57	57	Yes
		2023	32	8.7	41	57	No
		2030	32	1.6	34	57	No
		2036	32	0.6	33	57	No
		2045	32	0.7	33	57	No

[a] Exceedances of the thresholds are indicated in bold.
[b] The federal 1-hour NO_2 modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations. The state 1-hour NO_2 modeled concentration represents the maximum concentration.
[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[d] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
~~[f] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the 2008 Actual Baseline concentration at every modeled receptor.~~

Table B2-8. Maximum Off-Site Ambient SO2 and CO Concentrations Associated with the Revised Project

Pollutant	Averaging Period	Background Concentration (μg/m^3)[b]	Maximum Modeled Project Concentration Increment (μg/m^3)[c,e]	Total Concentration (μg/m^3)[a,d]	Significance Threshold (μg/m^3)	Threshold Exceeded?
SO_2	Federal 1-hour	61	< 0	61	196	No
	State 1-hour	137	< 0	137	655	No
	24-hour	24	< 0	24	105	No
CO	1-hour	5,740	2,216	7,956	23,000	No
	8-hour	3,444	1,554	4,998	10,000	No

[a] Exceedances of the thresholds are indicated in bold.
[b] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[c] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[d] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
[e] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the 2008 Actual Baseline concentration at every modeled receptor.

Table B2-9. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentration Increments Associated with the Revised Project

Pollutant	Averaging Period	Analysis Year	Maximum Modeled Project Concentration Increment ($\mu g/m^3$)[a,b,c,d]	Significance Threshold ($\mu g/m^3$)	Threshold Exceeded?
PM_{10}	24-hour	2012	1.9	2.5	No
		2014	5.9	2.5	Yes
		2018	4.7	2.5	Yes
		2023	4.9	2.5	Yes
		2030	3.8	2.5	Yes
		2036	3.9	2.5	Yes
		2045	3.9	2.5	Yes
	Annual	2012	0.7	1.0	No
		2014	1.9	1.0	Yes
		2018	1.5	1.0	Yes
		2023	1.7	1.0	Yes
		2030	1.4	1.0	Yes
		2036	1.4	1.0	Yes
		2045	1.4	1.0	Yes
$PM_{2.5}$	24-hour	2012	1.2	2.5	No
		2014	2.2	2.5	No
		2018	1.2	2.5	No
		2023	0.3	2.5	No
		2030	< 0	2.5	No
		2036	< 0	2.5	No
		2045	< 0	2.5	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.

[c] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the 2008 Baseline concentration at every modeled receptor.

[d] Because the thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds, background concentrations are not added to the Maximum Modeled Project Concentration Increment.

Figures B2-6 and B2-7 show the locations of the maximum modeled concentrations of NO_2, CO, PM_{10}, and $PM_{2.5}$ associated with the Revised Project. The locations in the figures correspond to the concentrations displayed in Tables B2-7, B2-8, and B2-9. In the figures, only the receptor locations with modeled concentration increments greater than zero are shown because negative increments would approach a maximum value of zero infinitely far away from the Project site.

Figure B2-6. Locations of Maximum Modeled Pollutant Concentrations Associated with the Revised Project (far field)

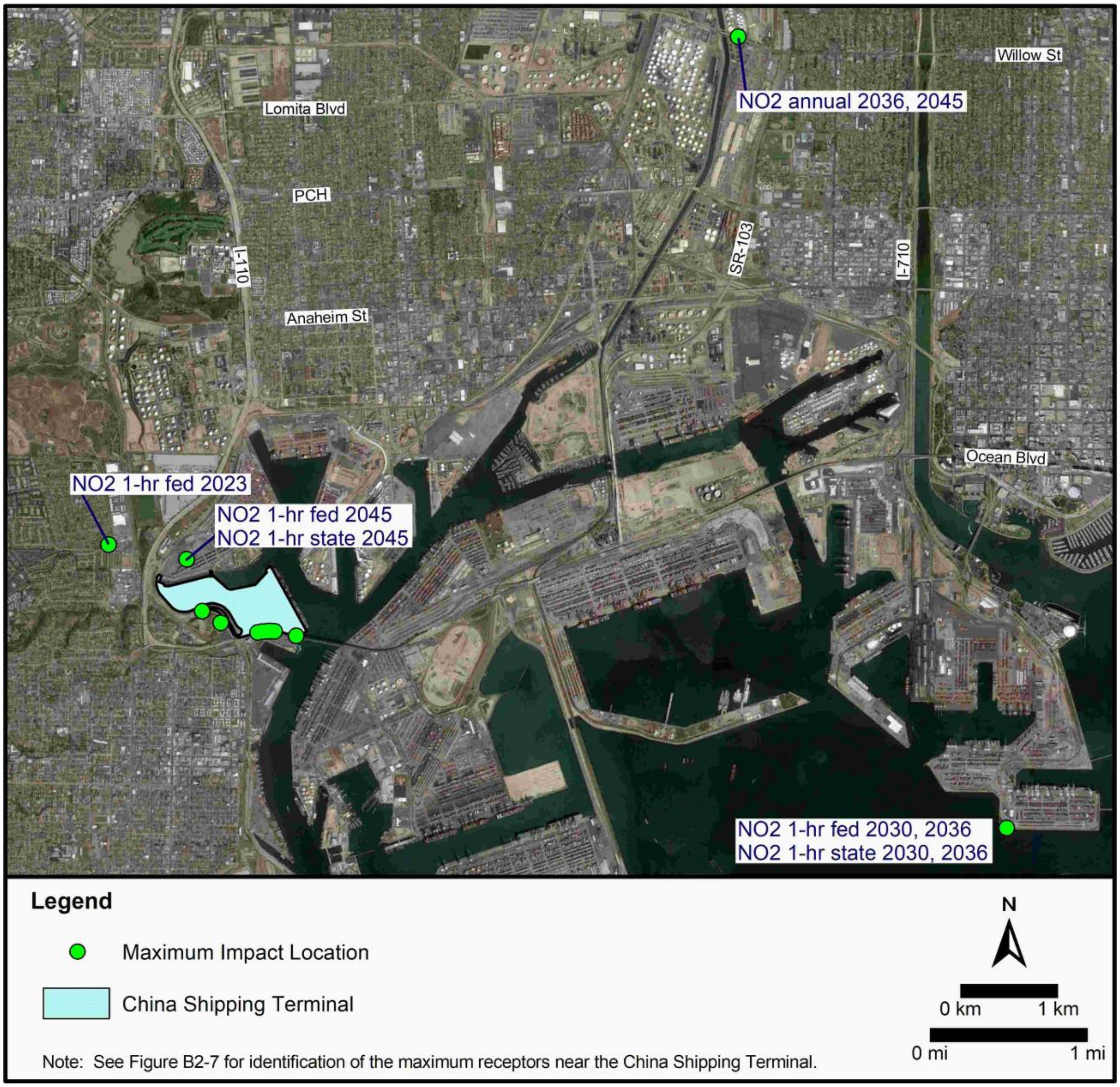
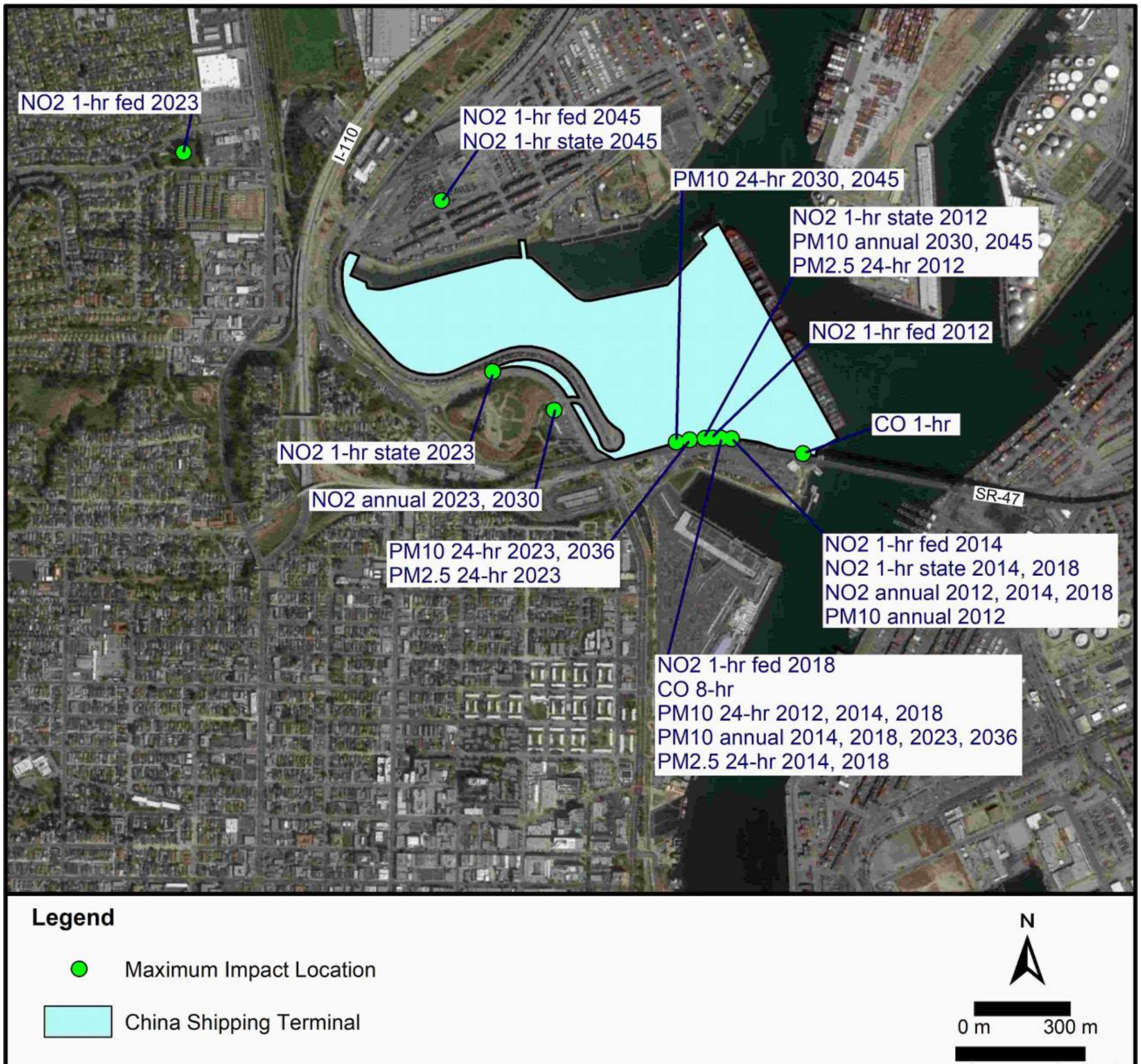


Figure B2-7. Locations of Maximum Modeled Pollutant Concentrations Associated with the Revised Project (near field)



Note: See Figure B2-6 for identification of maximum receptors farther away from the China Shipping Terminal.

Figures B2-8 and B2-9 show the areas where the federal 1-hour NO_2 concentrations associated with the Revised Project would exceed the significance threshold in 2014 and 2018, respectively. Figure B2-10 shows the area where the state 1-hour NO_2 concentration associated with the Revised Project would exceed the significance threshold in 2014. Figures B2-11 and B2-12 show the areas where the annual NO_2 concentrations associated with the Revised Project would exceed the significance threshold in 2014 and 2018, respectively. None of the exceedance areas would extend over existing residences.

Figures B2-13, B2-14, B2-15, B2-16, B2-17, and B2-18 show the areas where the 24-hour PM_{10} concentration increments associated with the Revised Project would exceed the significance threshold in 2014, 2018, 2023, 2030, 2036, and 2045, respectively. Figures B2-19, B2-20, B2-21, B2-22, B2-23, and B2-24 show the areas where the annual PM_{10} concentration increments associated with the Revised Project would exceed the significance threshold in 2014, 2018, 2023, 2030, 2036, and 2045, respectively. None of the exceedance areas would extend over existing residences.

Figure B2-8. Area of Threshold Exceedance for the Revised Project; 2014 Federal 1-Hour NO_2 Concentrations

Figure B2-9. Area of Threshold Exceedance for the Revised Project; 2018 Federal 1-Hour NO_2 Concentrations

Figure B2-10. Area of Threshold Exceedance for the Revised Project; 2014 State 1-Hour NO_2 Concentrations

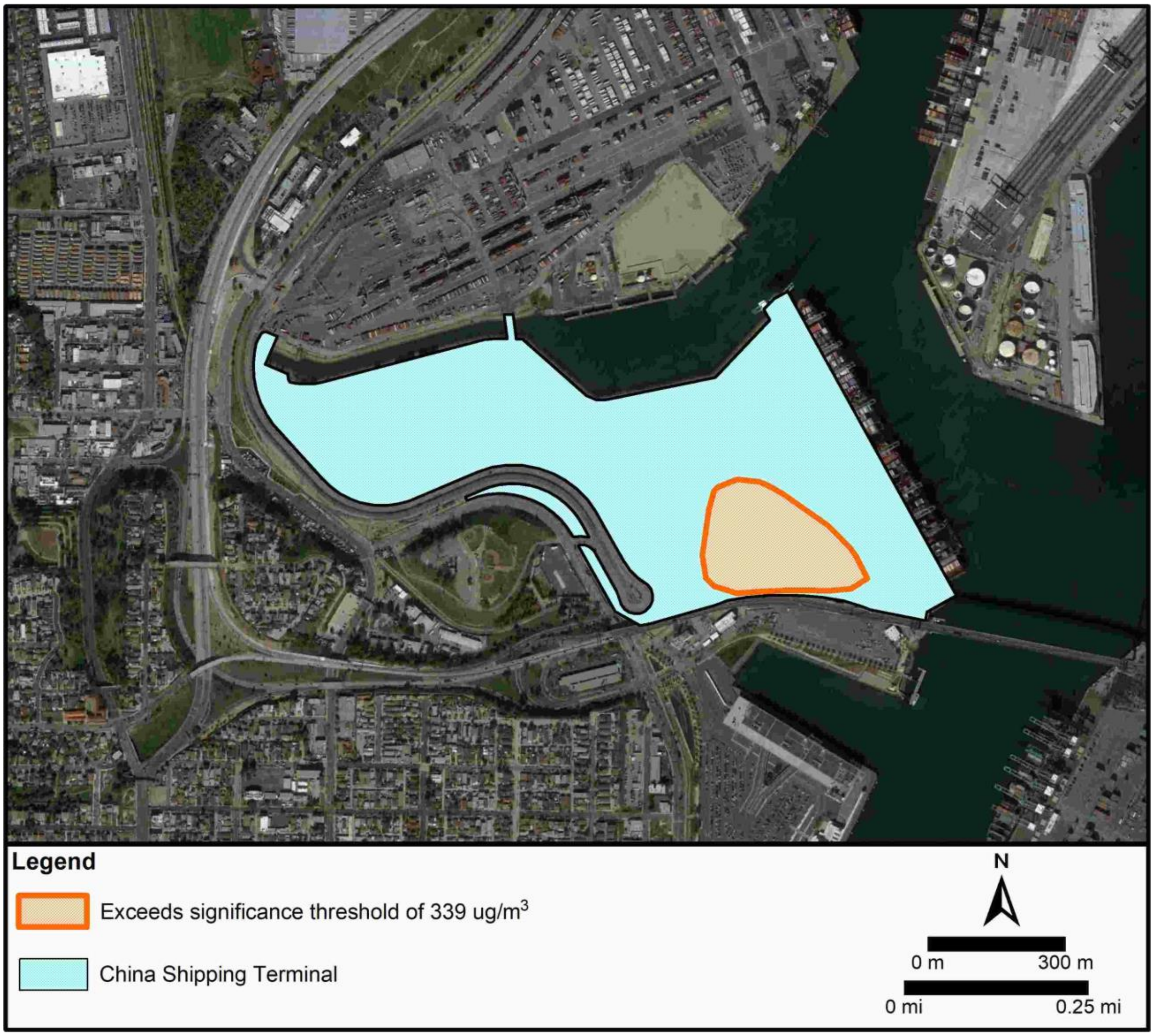


Figure B2-11. Area of Threshold Exceedance for the Revised Project; 2014 Annual NO_2 Concentrations

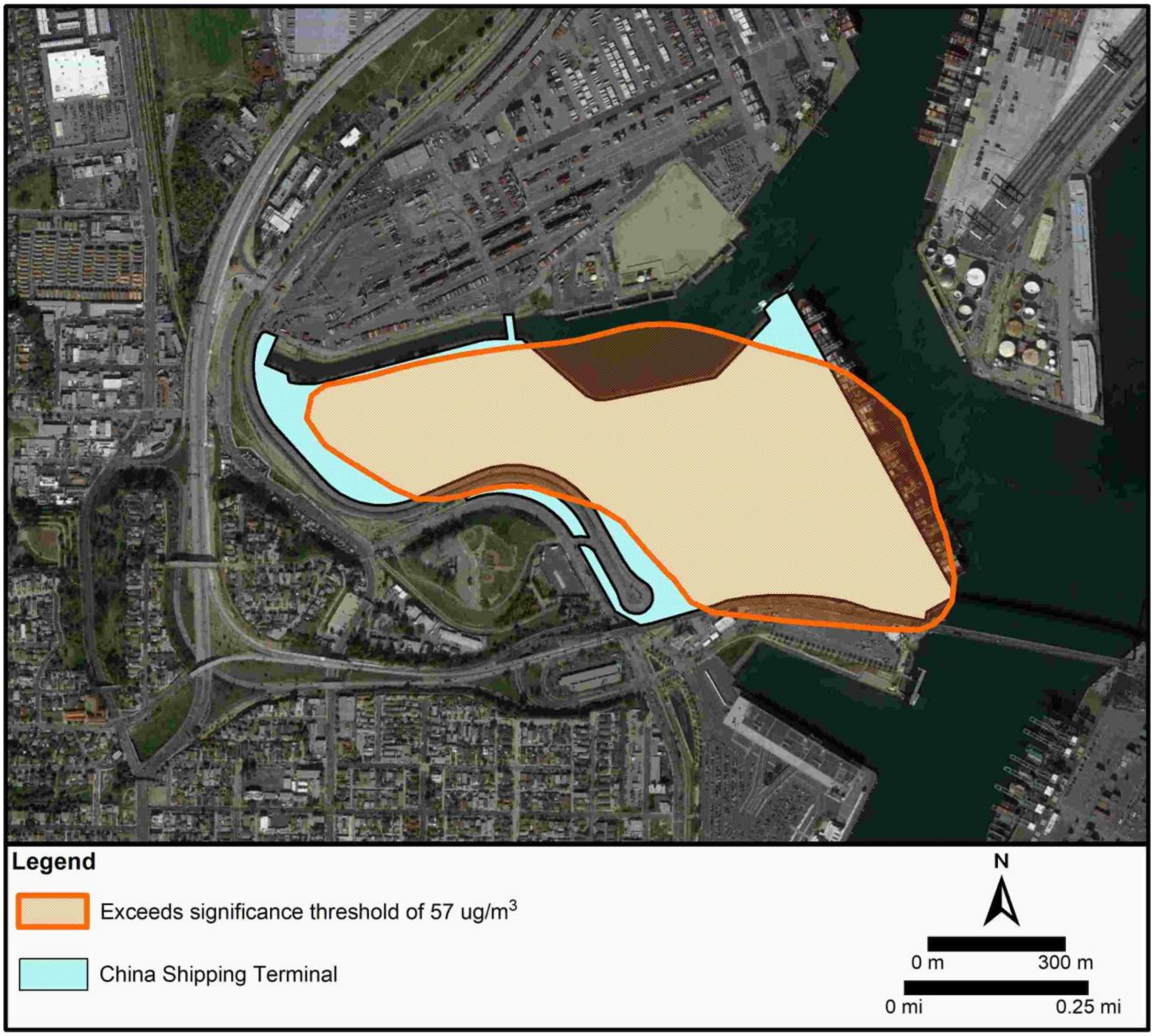


Figure B2-12. Area of Threshold Exceedance for the Revised Project; 2018 Annual NO_2 Concentrations

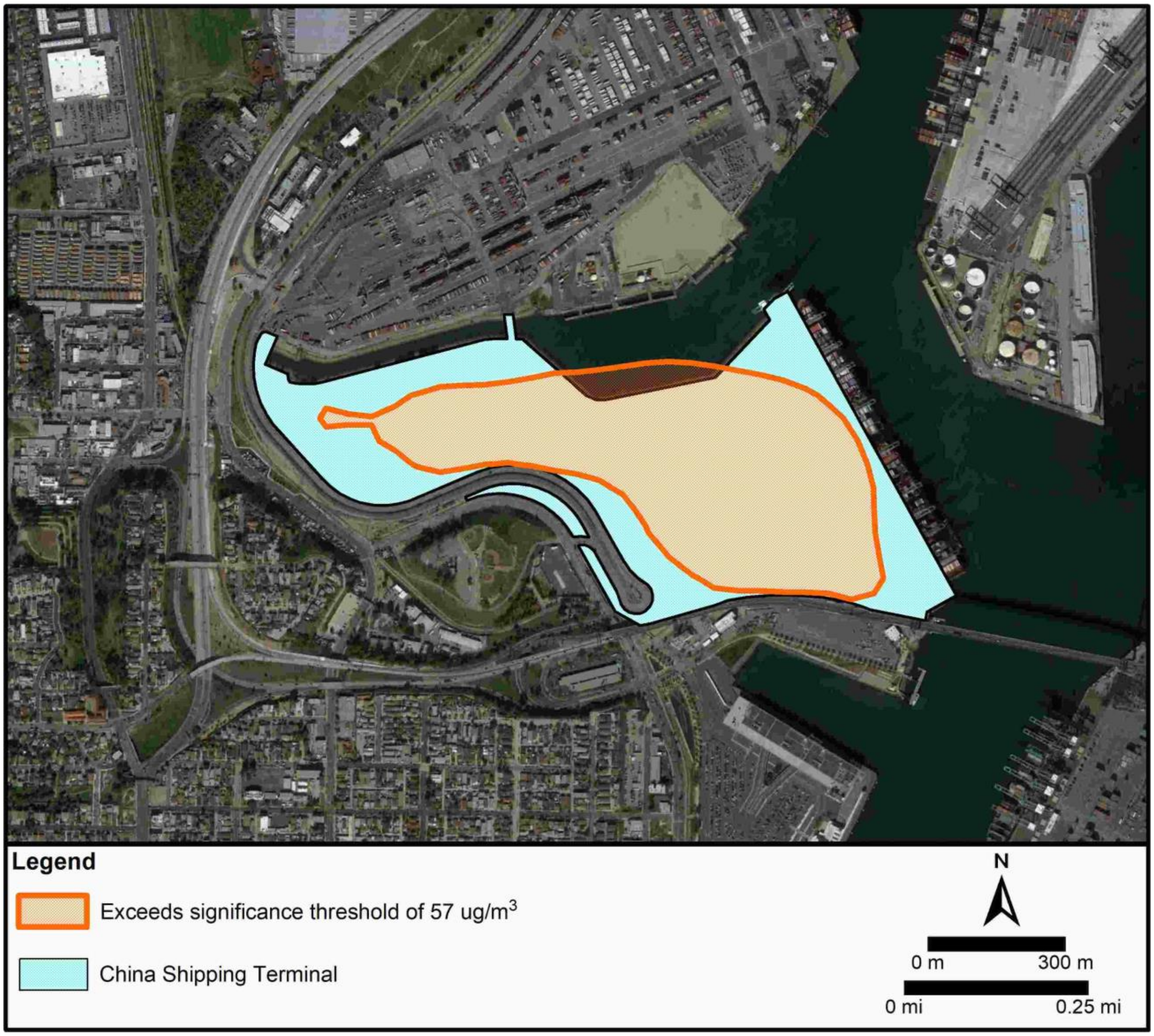


Figure B2-13. Area of Threshold Exceedance for the Revised Project; 2014 24-Hour PM_{10} Concentration Increments

Figure B2-14. Area of Threshold Exceedance for the Revised Project; 2018 24-Hour PM_{10} Concentration Increments

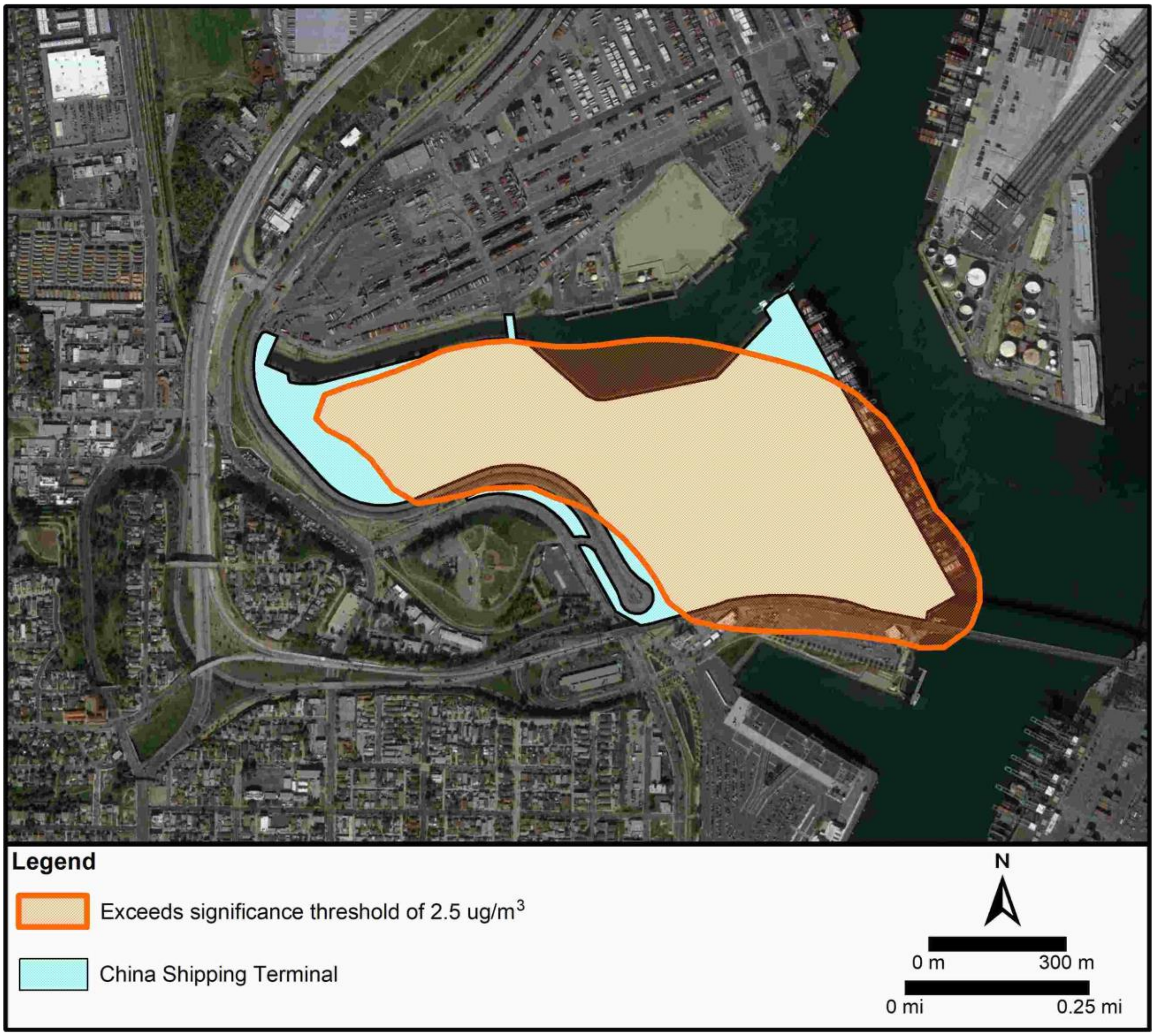


Figure B2-15. Area of Threshold Exceedance for the Revised Project; 2023 24-Hour PM_{10} Concentration Increments

Figure B2-16. Area of Threshold Exceedance for the Revised Project; 2030 24-Hour PM_{10} Concentration Increments

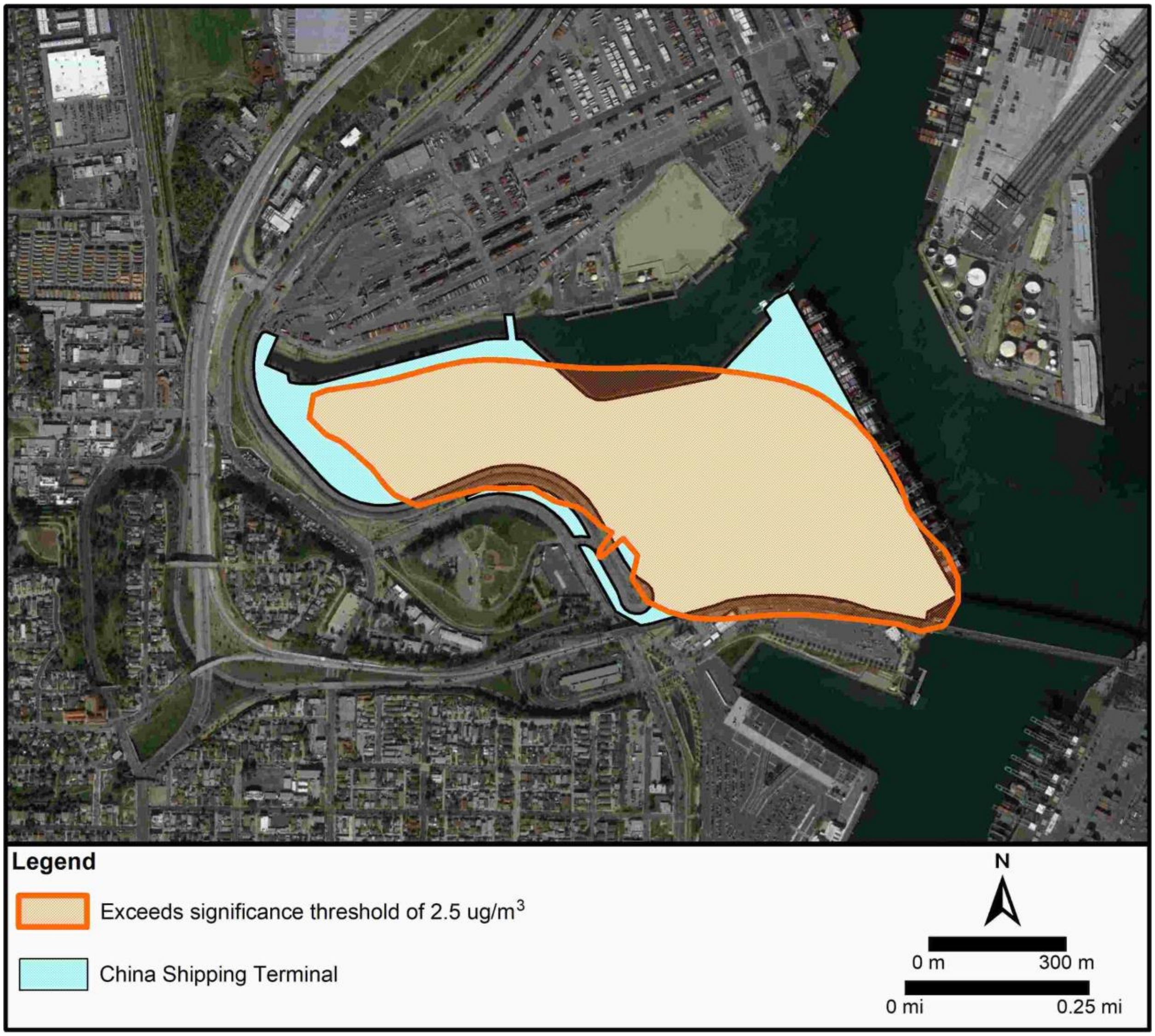


Figure B2-17. Area of Threshold Exceedance for the Revised Project; 2036 24-Hour PM_{10} Concentration Increments

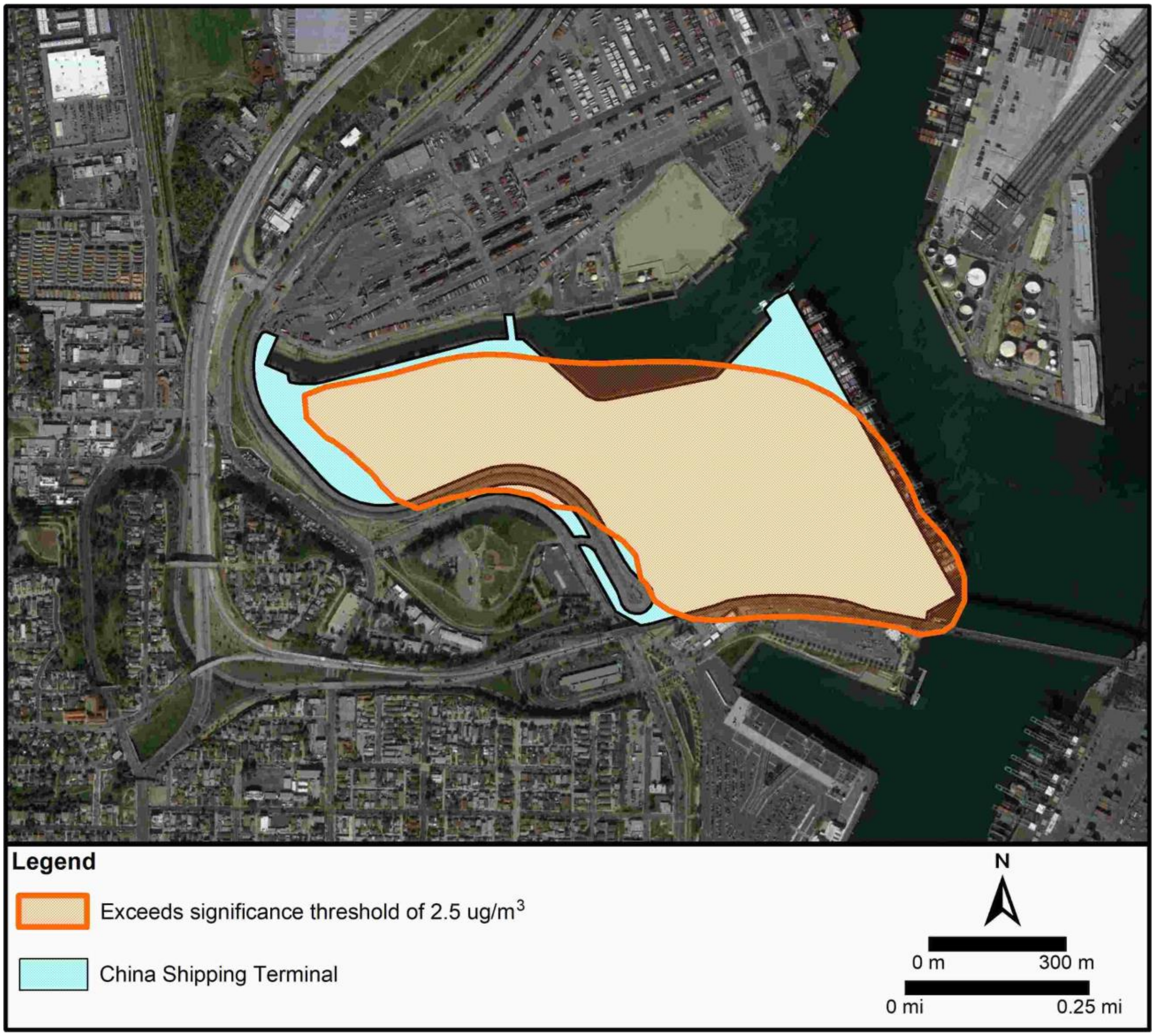


Figure B2-18. Area of Threshold Exceedance for the Revised Project; 2045 24-Hour PM_{10} Concentration Increments

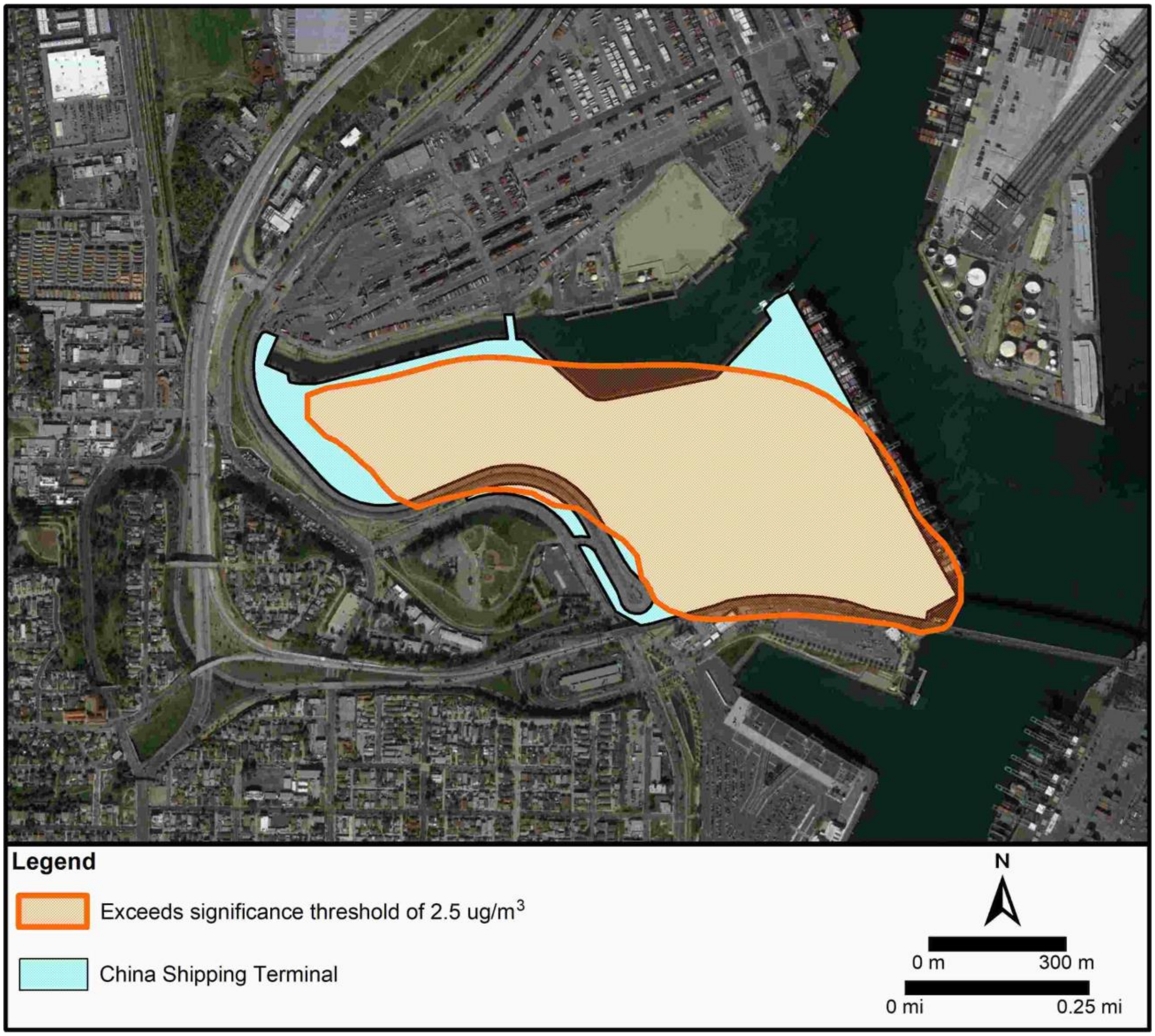


Figure B2-19. Area of Threshold Exceedance for the Revised Project; 2014 Annual PM_{10} Concentration Increments

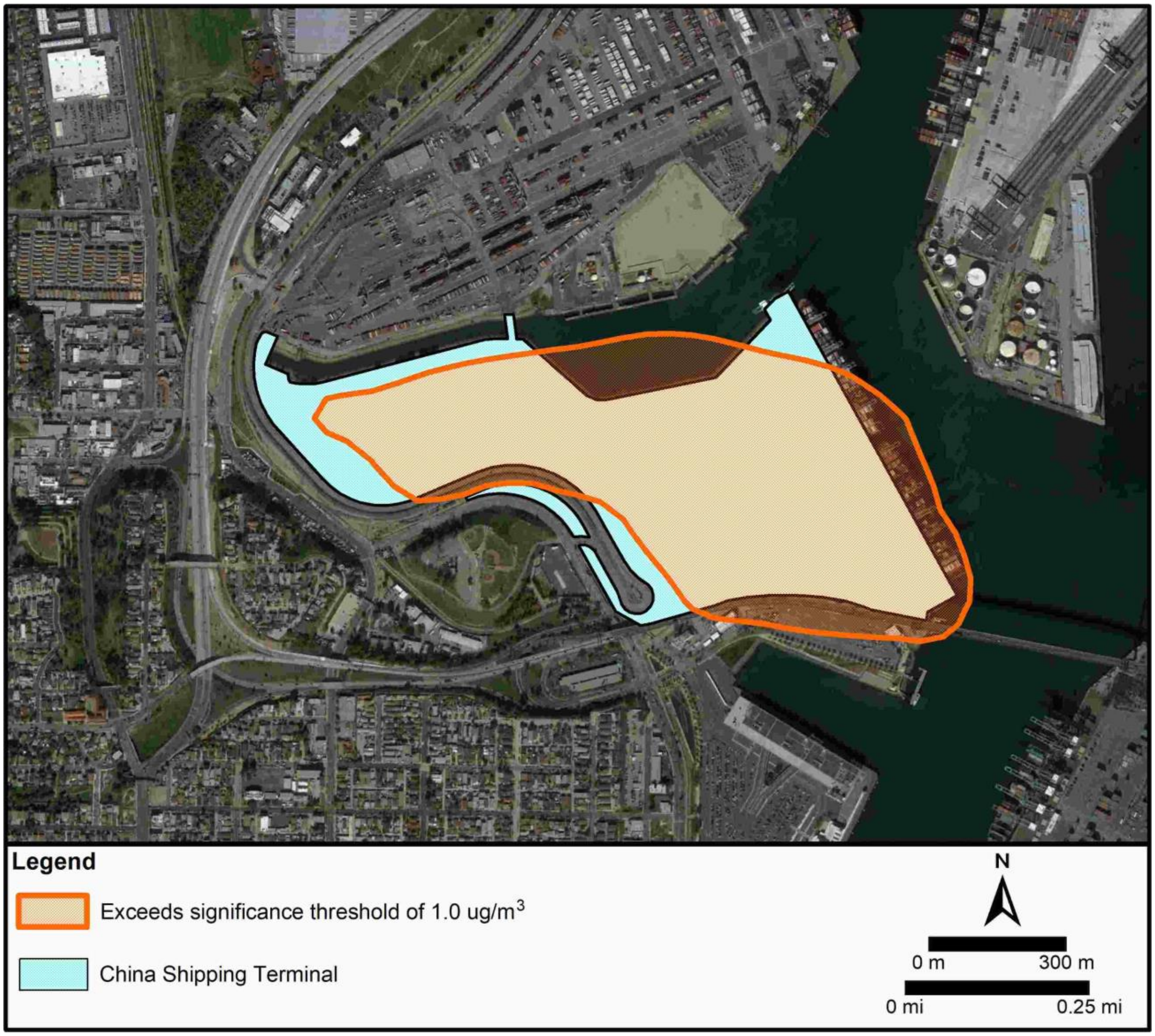


Figure B2-20. Area of Threshold Exceedance for the Revised Project; 2018 Annual PM_{10} Concentration Increments

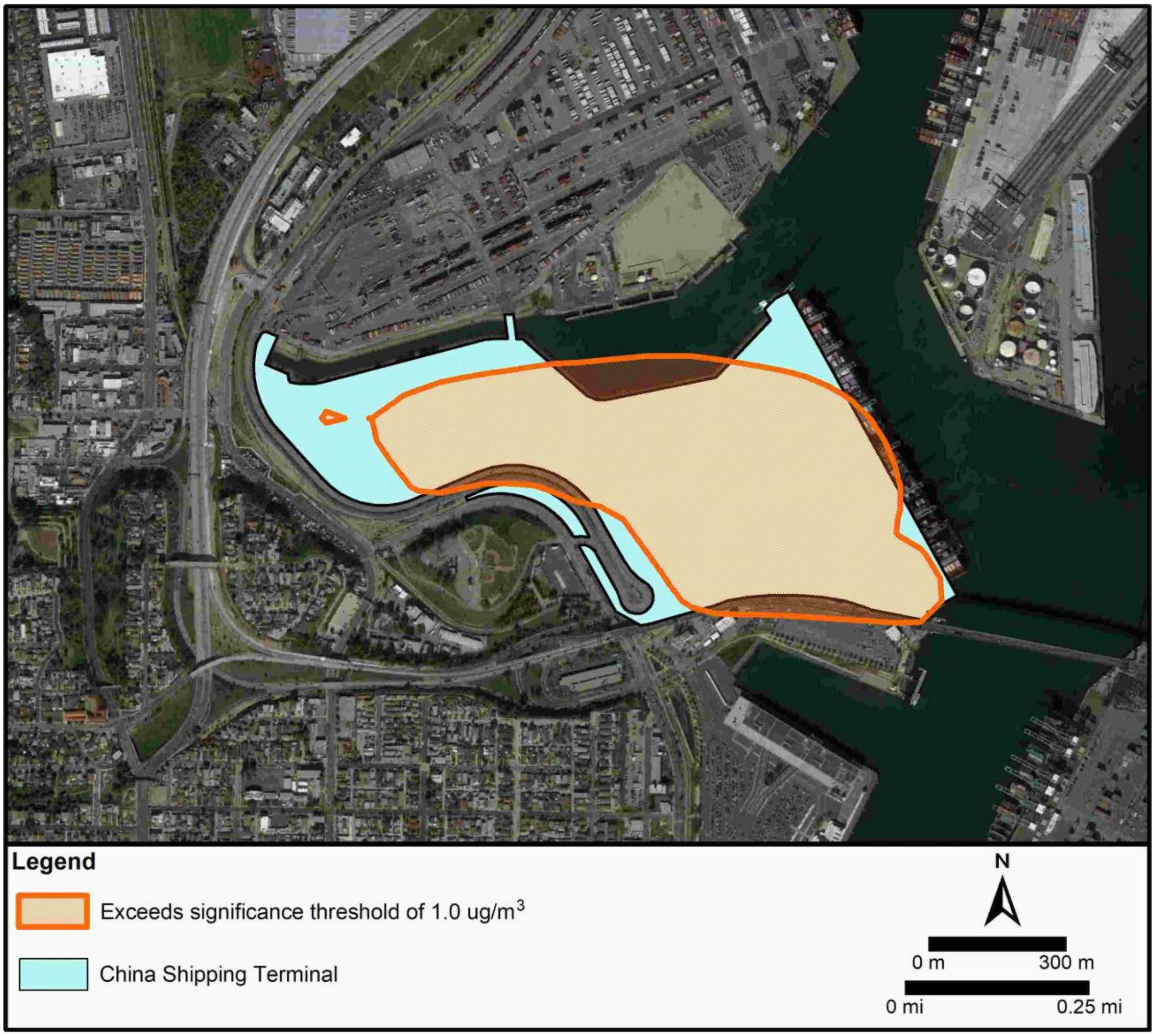


Figure B2-21. Area of Threshold Exceedance for the Revised Project; 2023 Annual PM_{10} Concentration Increments

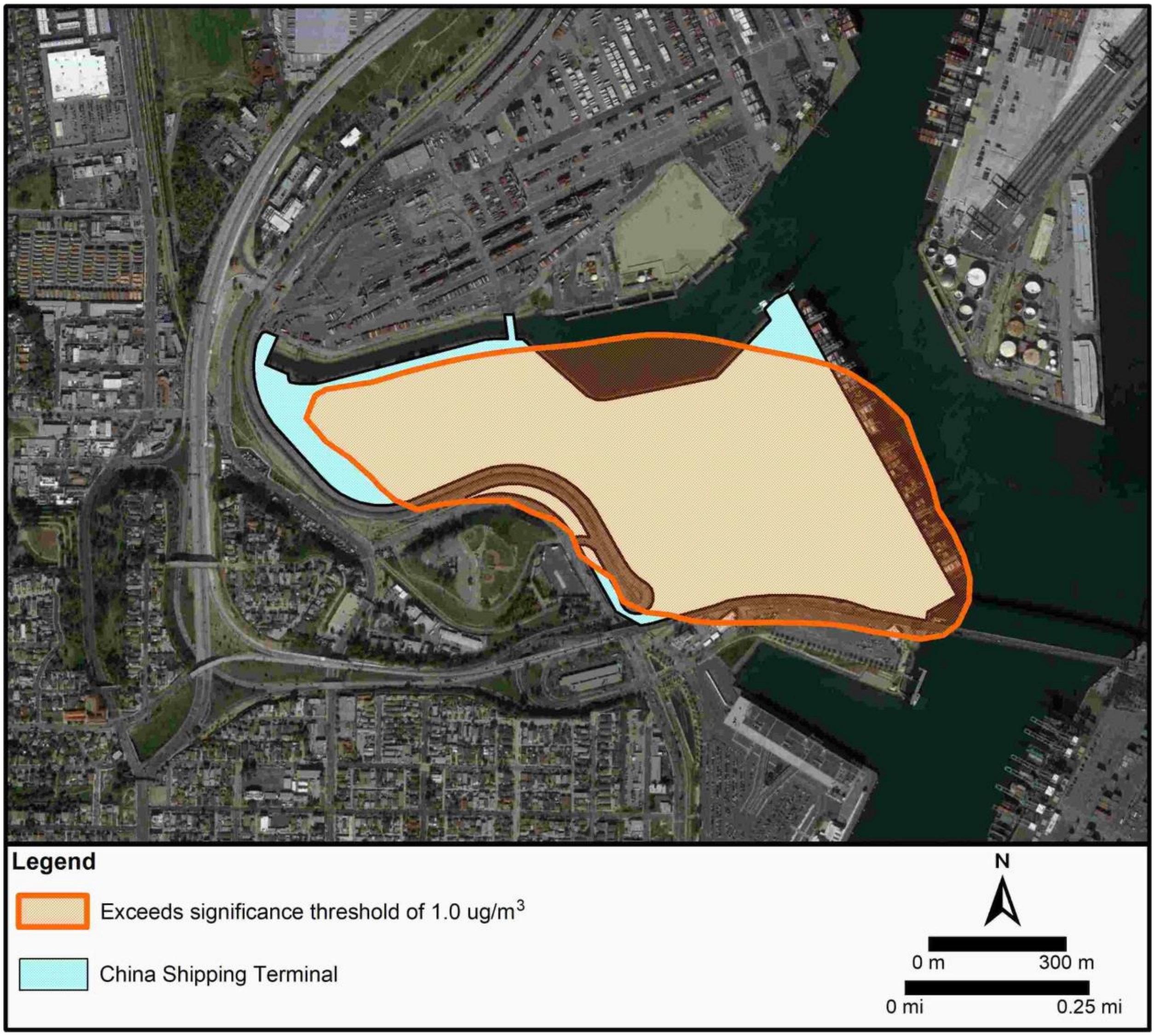


Figure B2-22. Area of Threshold Exceedance for the Revised Project; 2030 Annual PM_{10} Concentration Increments

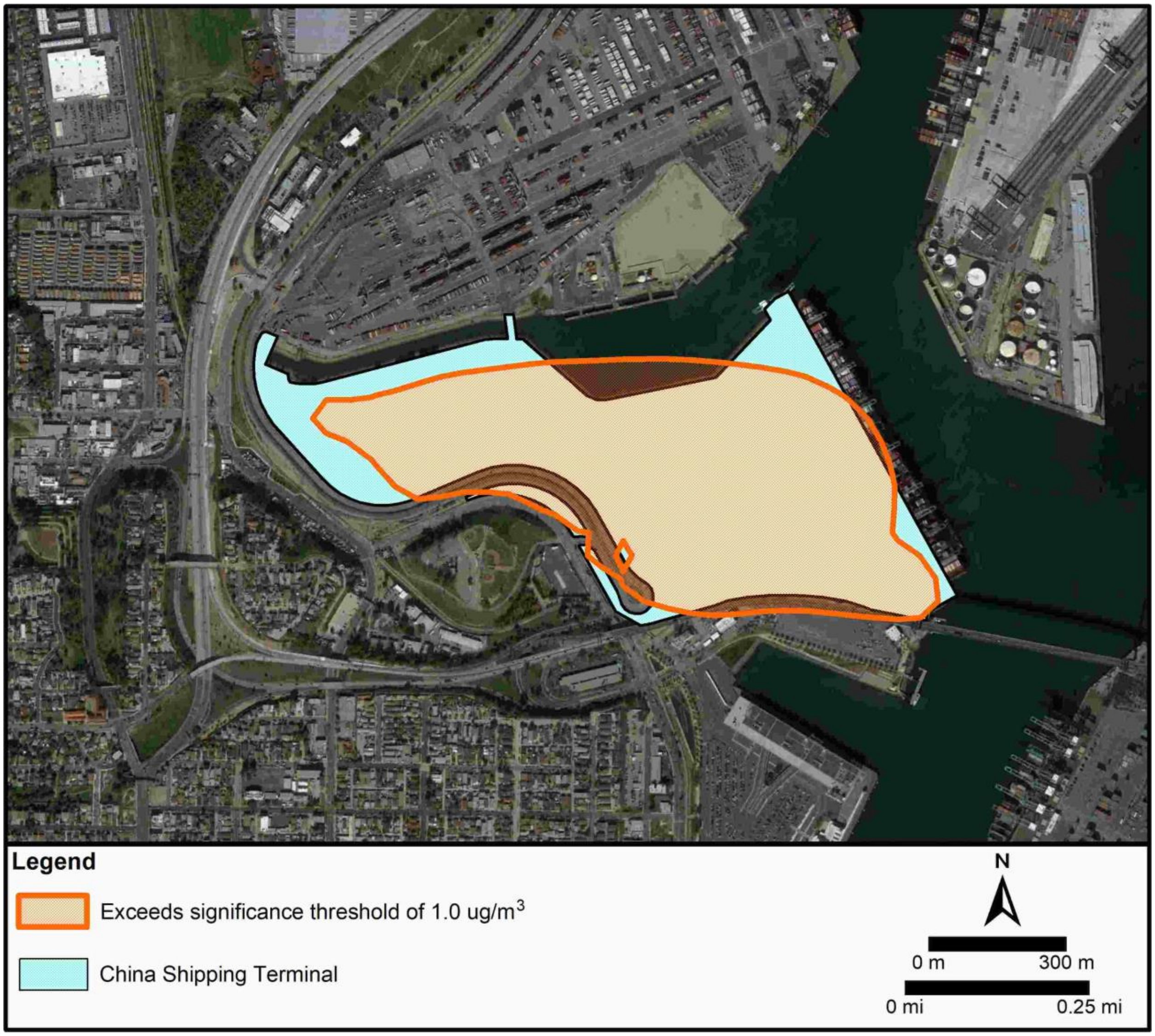


Figure B2-23. Area of Threshold Exceedance for the Revised Project; 2036 Annual PM_{10} Concentration Increments

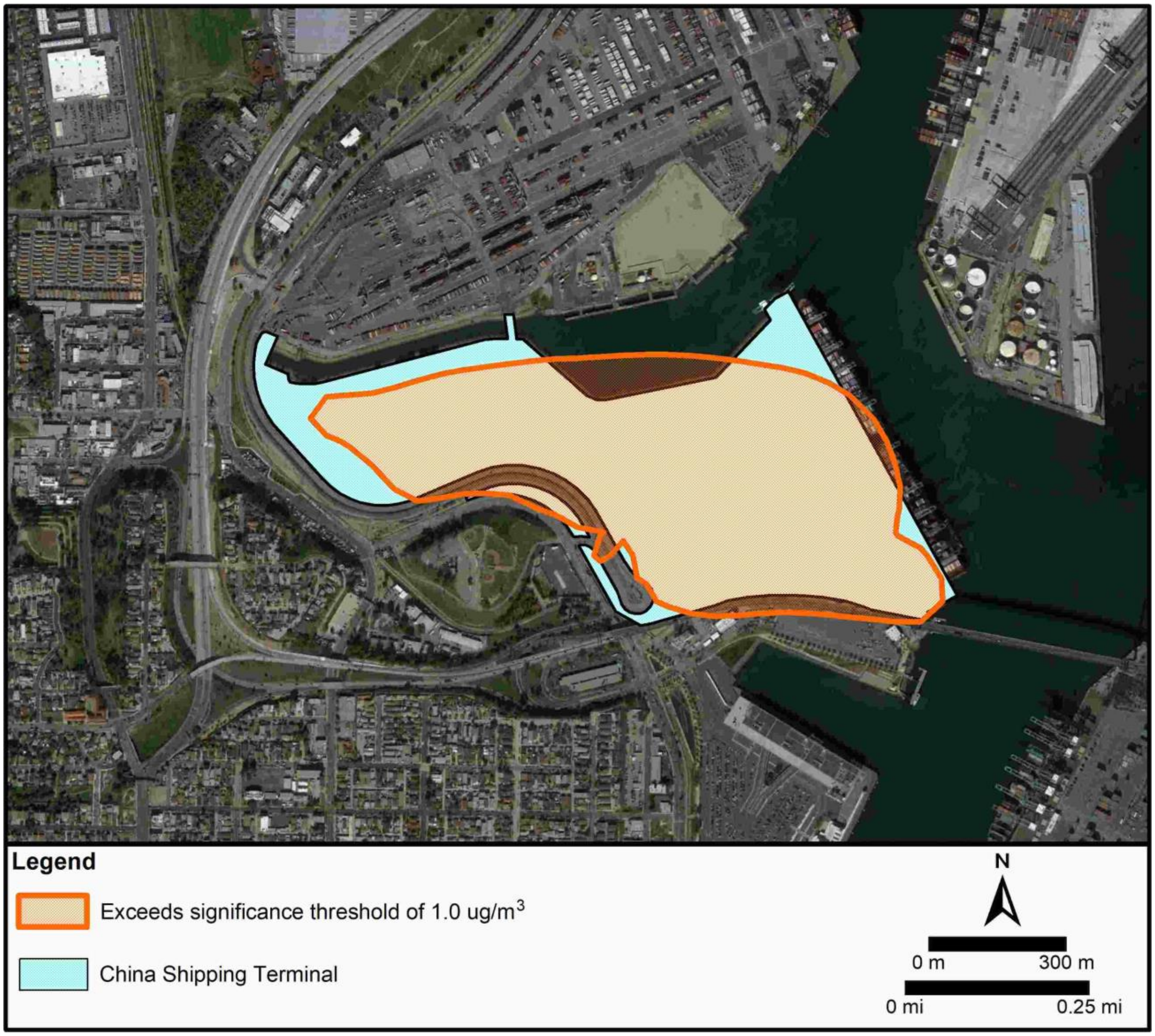


Figure B2-24. Area of Threshold Exceedance for the Revised Project; 2045 Annual PM_{10} Concentration Increments

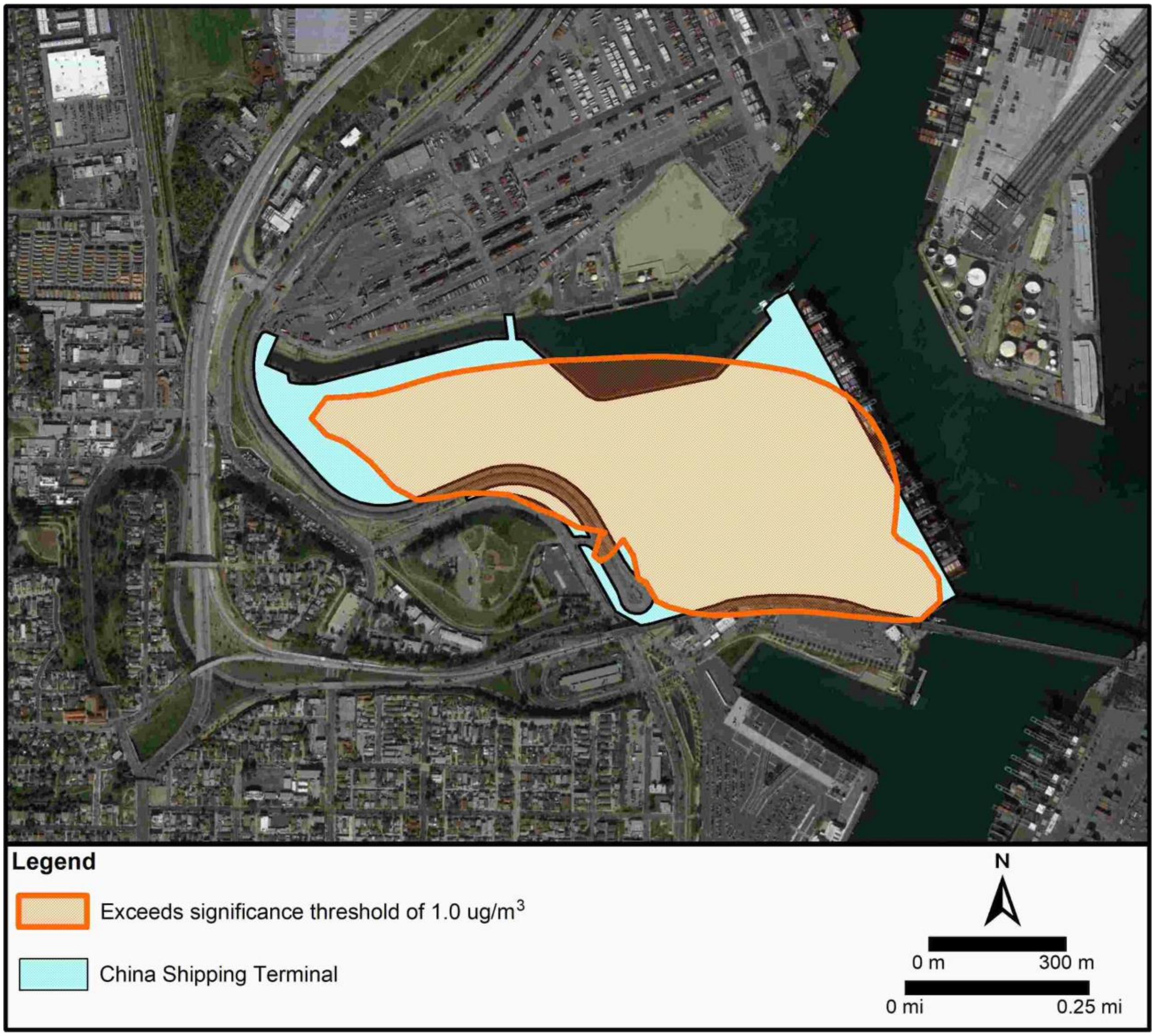


Table B2-10 presents the contributions by source type to the maximum off-site pollutant concentrations associated with the Revised Project. The table presents contributions in the analysis year with the greatest predicted impact for those pollutants and averaging times that would exceed a significance threshold. In the case of the Revised Project, all presented impacts (federal 1-hour, state 1-hour, and annual NO_2; and 24-hour and annual PM_{10}) would occur in analysis year 2014 along the southern boundary of the China Shipping terminal. The table shows that, at this location adjacent to the terminal, cargo handling equipment and on-site trucks are the primary contributors.

Table B2-10. Source Contributions to Maximum Off-Site Pollutant Concentrations Associated with the Revised Project

Source Category	Contribution at Maximum Off-Site Receptor [a]				
	Federal 1-Hour NO_2	State 1-Hour NO_2	Annual NO_2	24-Hour PM_{10}	Annual PM_{10}
Ships in Transit	17.6%	17.8%	0.1%	0.1%	0.0%
Ships at Berth	2.1%	2.7%	0.2%	0.6%	0.2%
Ships at Anchorage	2.4%	3.0%	0.1%	0.3%	0.0%
Tugboats	2.0%	2.5%	0.1%	0.3%	0.1%
Trucks at Gates and On-Terminal	13.4%	13.7%	12.6%	55.6%	57.1%
Trucks Driving Off-Terminal	0.8%	0.8%	0.4%	0.6%	0.5%
Switch Locomotives	0.2%	0.2%	0.1%	0.0%	0.0%
Line Haul Locomotives	0.8%	0.8%	0.1%	0.3%	0.2%
Cargo Handling Equipment	84.8%	87.7%	86.3%	43.1%	41.6%
Worker Vehicles	0.0%	0.0%	0.0%	0.5%	0.3%

[a] Percentages for 1-Hour and 24-Hour averaging periods add to greater than 100 percent because maximum source contributions do not occur simultaneously.

3.3.2 FEIR Mitigated Scenario

Impacts associated with the FEIR Mitigated Scenario are presented for informational purposes to enable a comparison to the Revised Project. Table B2-11 presents the maximum off-site NO_2 concentration impacts associated with the FEIR Mitigated Scenario in each analysis year. Results show that impacts would be below the NO_2 significance thresholds in all analysis years.

Table B2-12 presents the maximum off-site SO_2 and CO concentration impacts associated with the FEIR Mitigated Scenario. Because prior Port projects have shown that SO_2 and CO are unlikely to exceed the significance thresholds, a conservative screening approach was used for SO_2 and CO where each AERMOD source was modeled with its maximum emissions over all analysis years. The screening results show that impacts would be below the SO_2 and CO significance thresholds in all analysis years.

Table B2-13 presents the maximum off-site PM_{10} and $PM_{2.5}$ concentration increments associated with the FEIR Mitigated Scenario in each analysis year. Results show that impacts would exceed the 24-hour and annual PM_{10} significance thresholds in 2014, 2023, 2030, 2036, and 2045. Impacts would be below the $PM_{2.5}$ significance thresholds in all analysis years.

Table B2-11. Maximum Off-Site Ambient NO_2 Concentrations Associated with the FEIR Mitigated Scenario

Pollutant	Averaging Period	Analysis Year	Background Concentration[c] ($\mu g/m^3$)	Maximum Modeled Project Concentration Increment ($\mu g/m^3$)[a,d,~~f~~]	Total Concentration[e] ($\mu g/m^3$)	Significance Threshold ($\mu g/m^3$)	Threshold Exceeded?
NO_2[b]	Federal 1-hour	2012	139	9.6	149	188	No
		2014	127	53.5	180	188	No
		2018	123	9.1	132	188	No
		2023	123	11.1	134	188	No
		2030	123	11.6	135	188	No
		2036	123	4.3	127	188	No
		2045	123	0.7~~< 0~~	124~~123~~	188	No
	State 1-hour	2012	185	16.9	202	339	No
		2014	173	61.7	235	339	No
		2018	164	10.8	175	339	No
		2023	164	14.6	179	339	No
		2030	164	13.0	177	339	No
		2036	164	5.1	169	339	No
		2045	164	2.1~~1.3~~	166~~165~~	339	No
	Annual	2012	40	5.2	45	57	No
		2014	34	16.7	51	57	No
		2018	32	7.0~~6.4~~	39~~38~~	57	No
		2023	32	3.3	35	57	No
		2030	32	2.8	35	57	No
		2036	32	1.9	34	57	No
		2045	32	1.8	34	57	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The federal 1-hour NO_2 modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations. The state 1-hour NO_2 modeled concentration represents the maximum concentration.

[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).

[d] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of 2008 Actual Baseline.

[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.

~~[f] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the 2008 Actual Baseline concentration at every modeled receptor.~~

Table B2-12. Maximum Off-Site Ambient SO_2 and CO Concentrations Associated with the FEIR Mitigated Scenario

Pollutant	Averaging Period	Background Concentration[b] (µg/m³)	Maximum Modeled Project Concentration Increment (µg/m³)[a,c,e]	Total Concentration[d] (µg/m³)	Significance Threshold (µg/m³)	Threshold Exceeded?
SO_2	Federal 1-hour	61	< 0	61	196	No
	State 1-hour	137	< 0	137	655	No
	24-hour	24	< 0	24	105	No
CO	1-hour	5,740	2,245	7,985	23,000	No
	8-hour	3,444	1,569	5,013	10,000	No

[a] Exceedances of the thresholds are indicated in bold.
[b] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).
[c] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[d] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.
[e] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the 2008 Actual Baseline concentration at every modeled receptor.

Table B2-13. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentration Increments Associated with the FEIR Mitigated Scenario

Pollutant	Averaging Period	Analysis Year	Maximum Modeled Project Concentration Increment[a,b,c,d] (µg/m³)	Significance Threshold (µg/m³)	Threshold Exceeded?
PM_{10}	24-hour	2012	0.5	2.5	No
		2014	3.7	2.5	Yes
		2018	1.8	2.5	No
		2023	3.6	2.5	Yes
		2030	4.2	2.5	Yes
		2036	4.6	2.5	Yes
		2045	4.7	2.5	Yes
	Annual	2012	0.3	1.0	No
		2014	1.3	1.0	Yes
		2018	0.6	1.0	No
		2023	1.3	1.0	Yes
		2030	1.5	1.0	Yes
		2036	1.6	1.0	Yes
		2045	1.7	1.0	Yes
$PM_{2.5}$	24-hour	2012	0.004	2.5	No
		2014	0.2	2.5	No
		2018	< 0	2.5	No
		2023	< 0	2.5	No
		2030	< 0	2.5	No
		2036	< 0	2.5	No
		2045	< 0	2.5	No

[a] Exceedances of the thresholds are indicated in bold.
[b] The Modeled Project Concentration Increment represents the modeled concentration of the Project minus the modeled concentration of the 2008 Actual Baseline.
[c] A Maximum Modeled Project Concentration Increment less than zero means that the Project concentration would be less than the 2008 Actual Baseline concentration at every modeled receptor.
[d] Because the thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds, background concentrations are not added to the Maximum Modeled Project Concentration Increment.

Figures B2-25 and B2-26 show the locations of the maximum modeled concentrations of NO_2, CO, PM_{10}, and $PM_{2.5}$ associated with the FEIR Mitigated Scenario. The locations in the figures correspond to the concentrations displayed in Tables B2-11, B2-12, and B2-13. In the figures, only the receptor locations with modeled concentration increments greater than zero are shown because negative increments would approach a maximum value of zero infinitely far away from the Project site.

Figure B2-25. Locations of Maximum Modeled Pollutant Concentrations Associated with the FEIR Mitigated Scenario (far field)

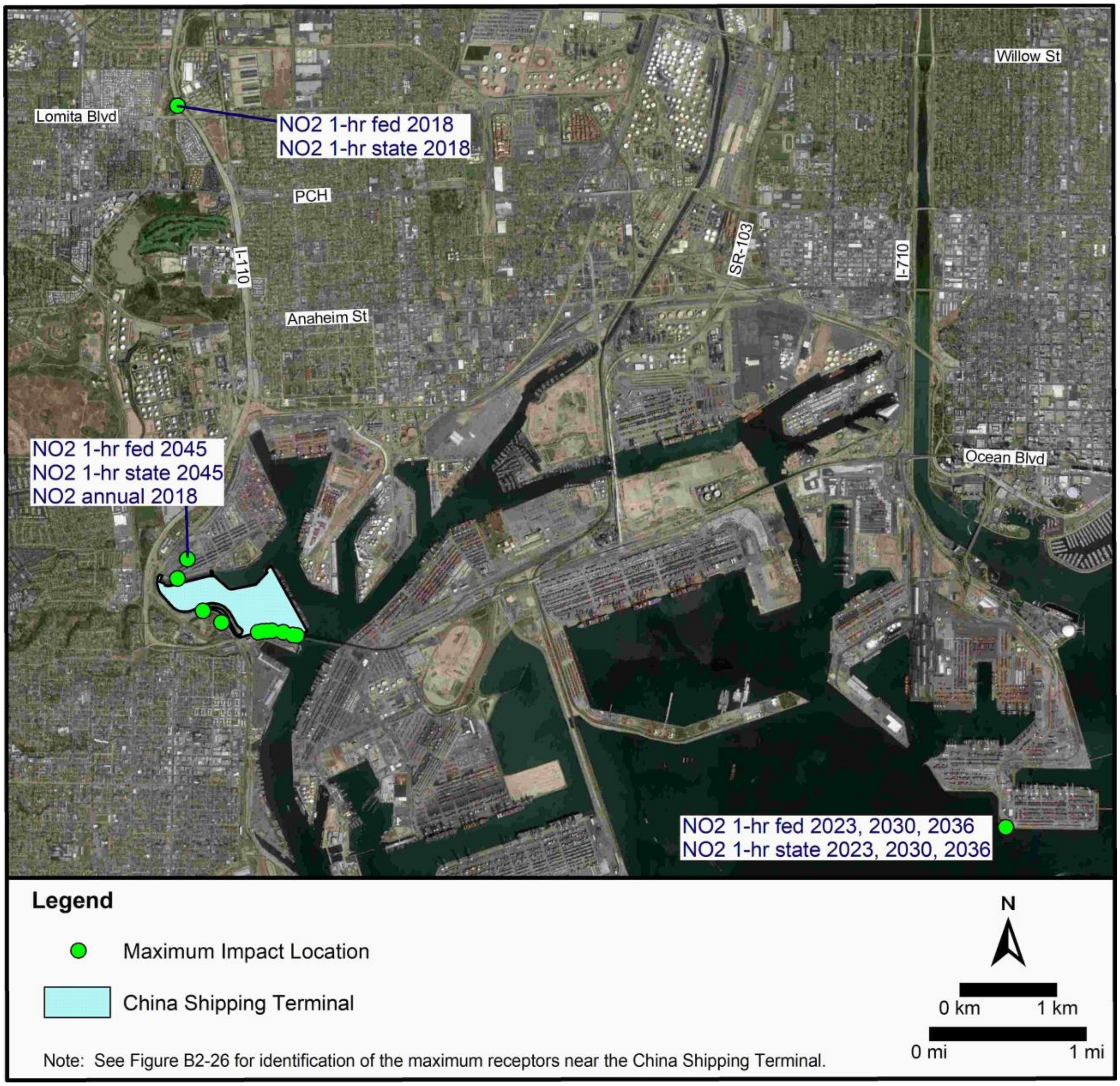
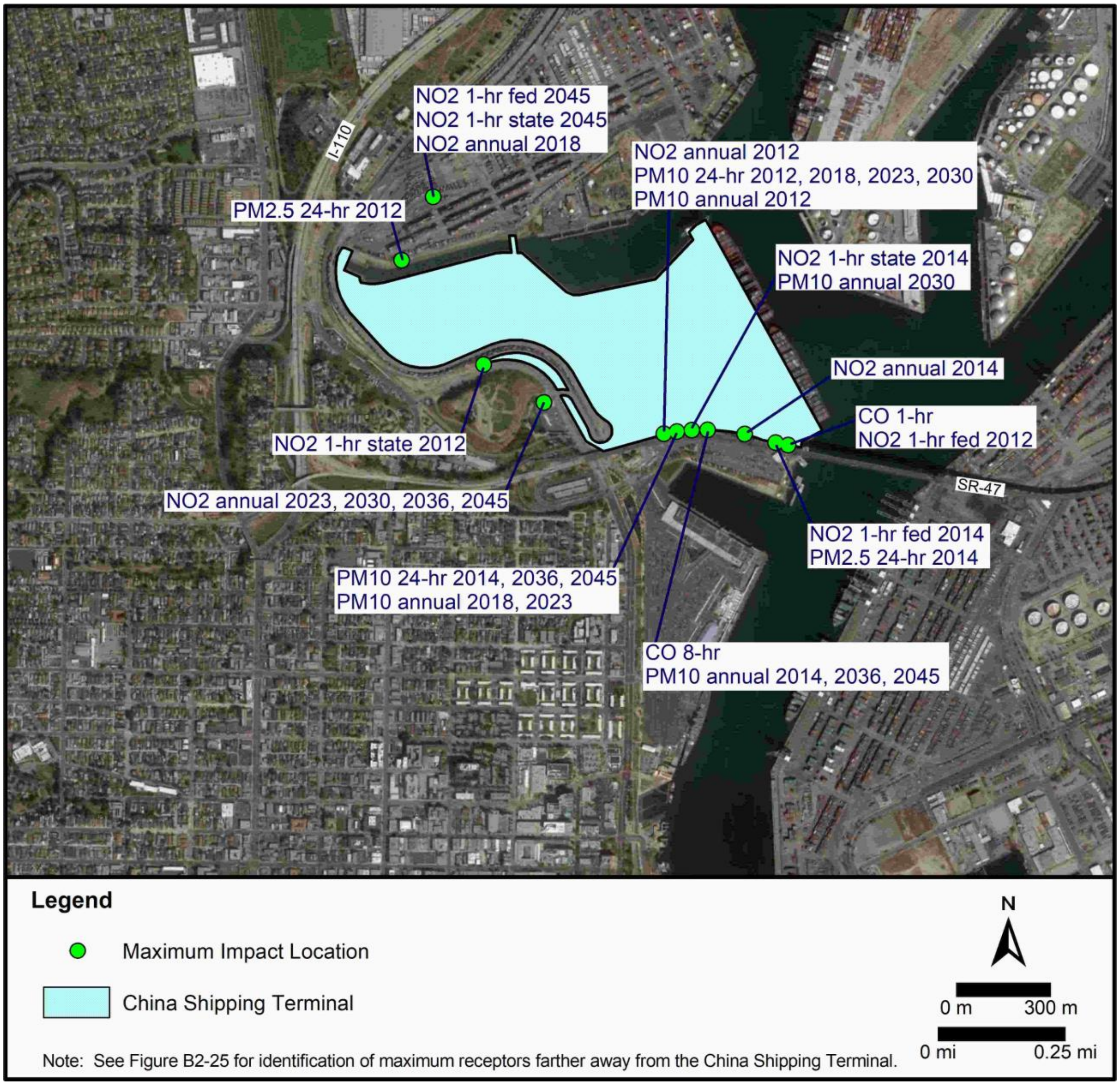


Figure B2-26. Locations of Maximum Modeled Pollutant Concentrations Associated with the FEIR Mitigated Scenario (near field)



Figures B2-27, B2-28, B2-29, B2-30, and B2-31 show the areas where the 24-hour PM_{10} concentration increments associated with the FEIR Mitigated Scenario would exceed the significance threshold in 2014, 2023, 2030, 2036, and 2045, respectively. Figures B2-32, B2-33, B2-34, B2-35, and B2-36 show the areas where the annual PM_{10} concentration increments associated with the FEIR Mitigated Scenario would exceed the significance threshold in 2014, 2023, 2030, 2036, and 2045, respectively. None of the exceedance areas would extend over existing residences.

Figure B2-27. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2014 24-Hour PM_{10} Concentration Increments

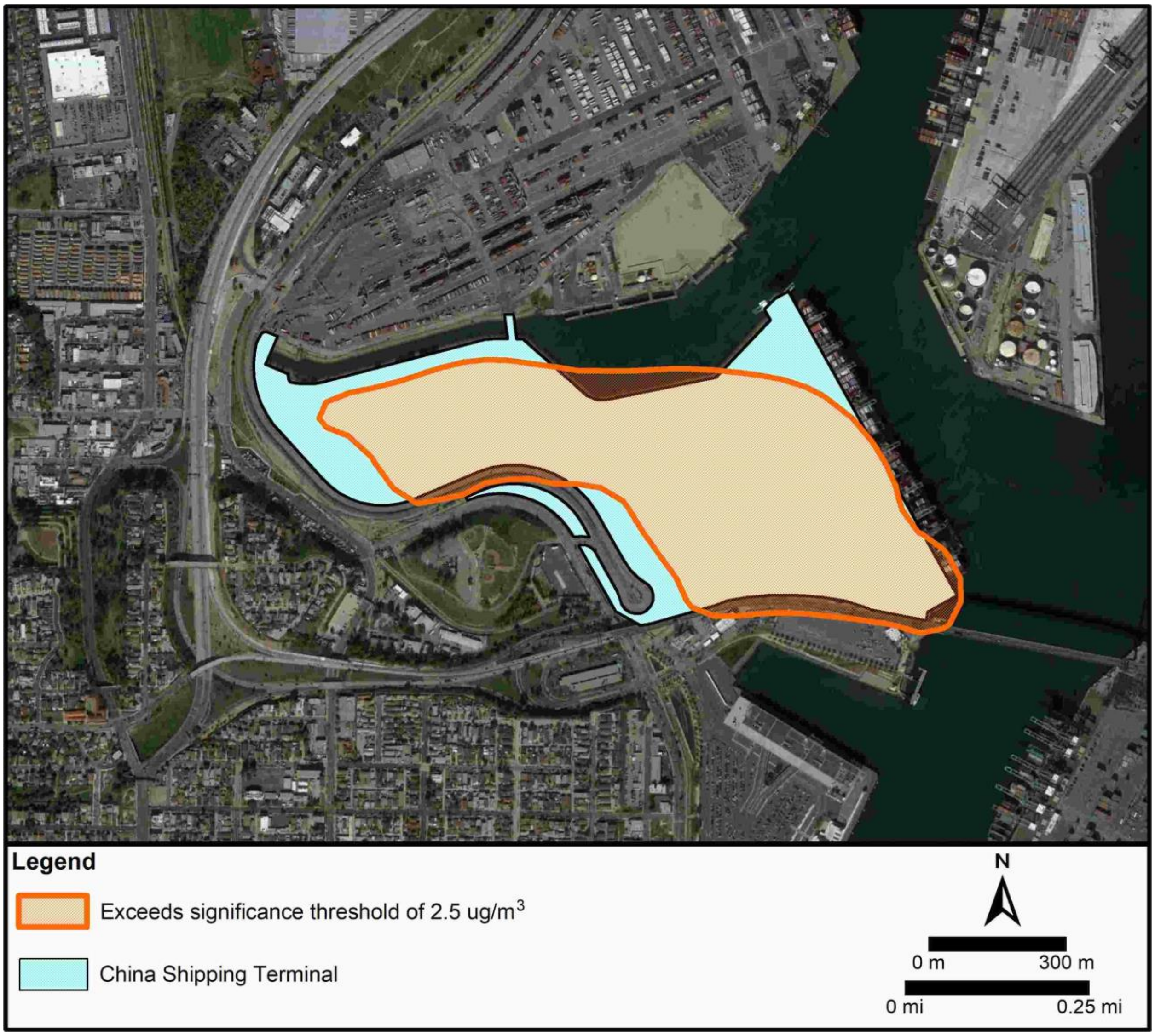


Figure B2-28. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2023 24-Hour PM_{10} Concentration Increments

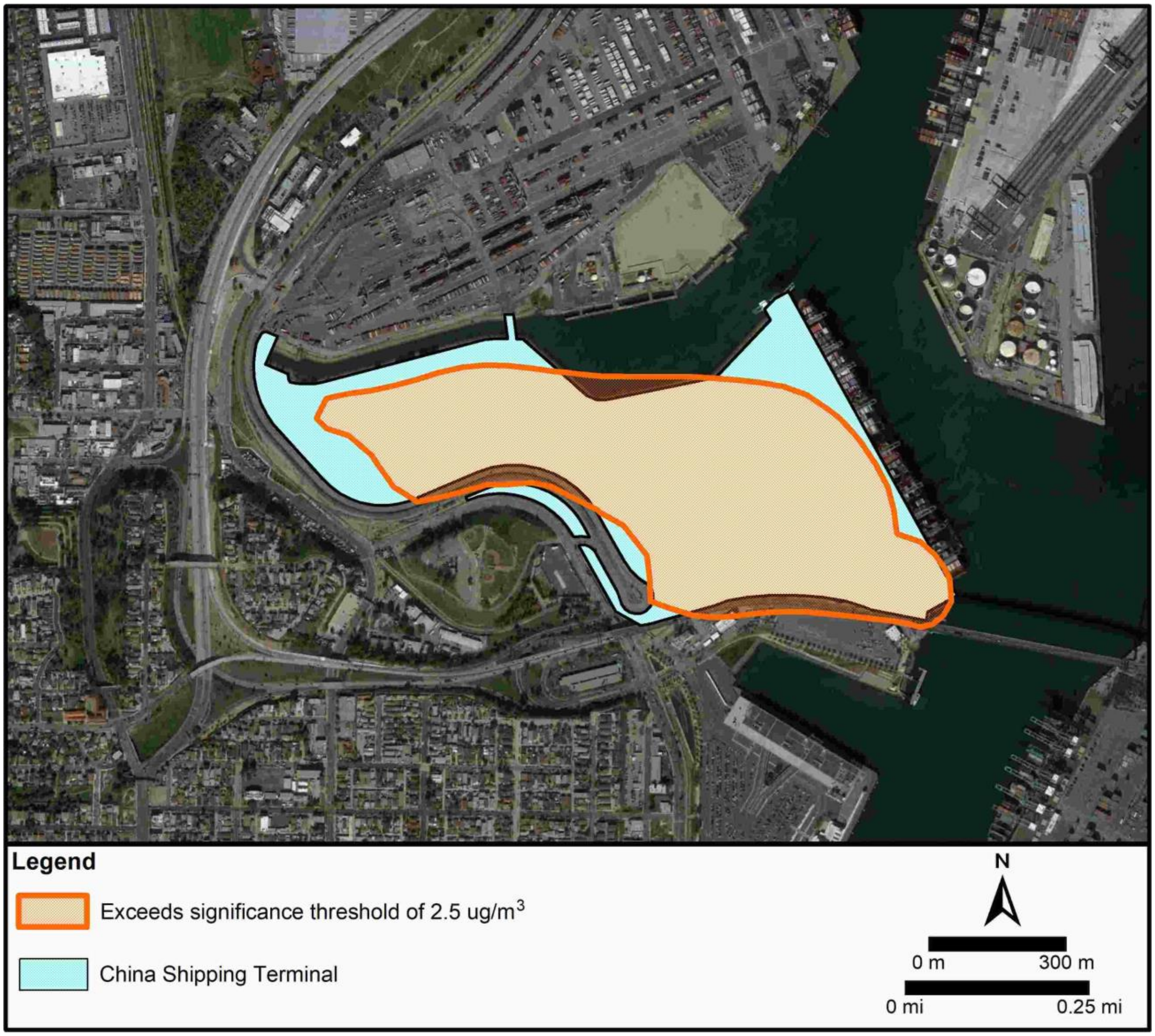


Figure B2-29. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2030 24-Hour PM_{10} Concentration Increments

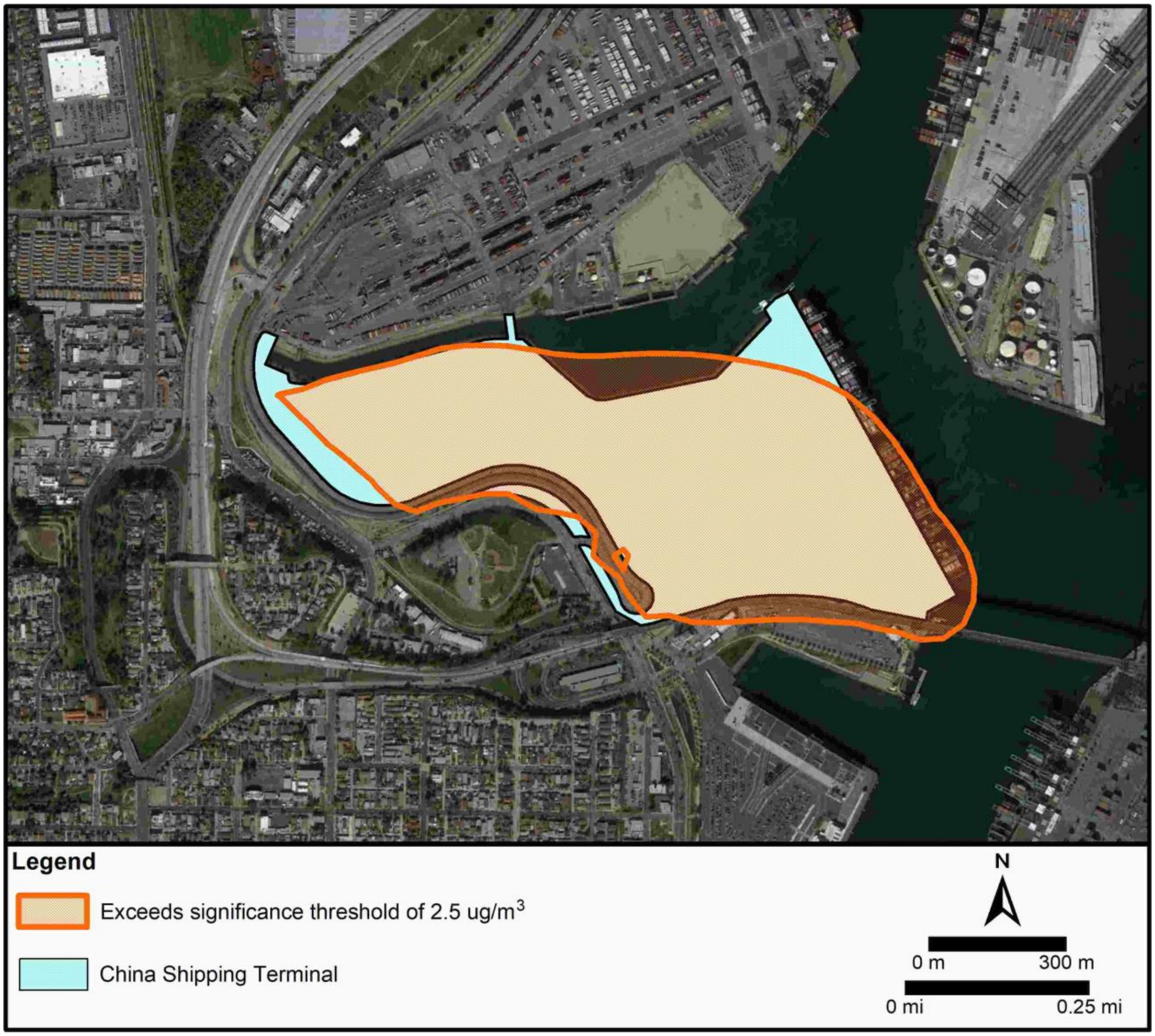


Figure B2-30. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2036 24-Hour PM_{10} Concentration Increments

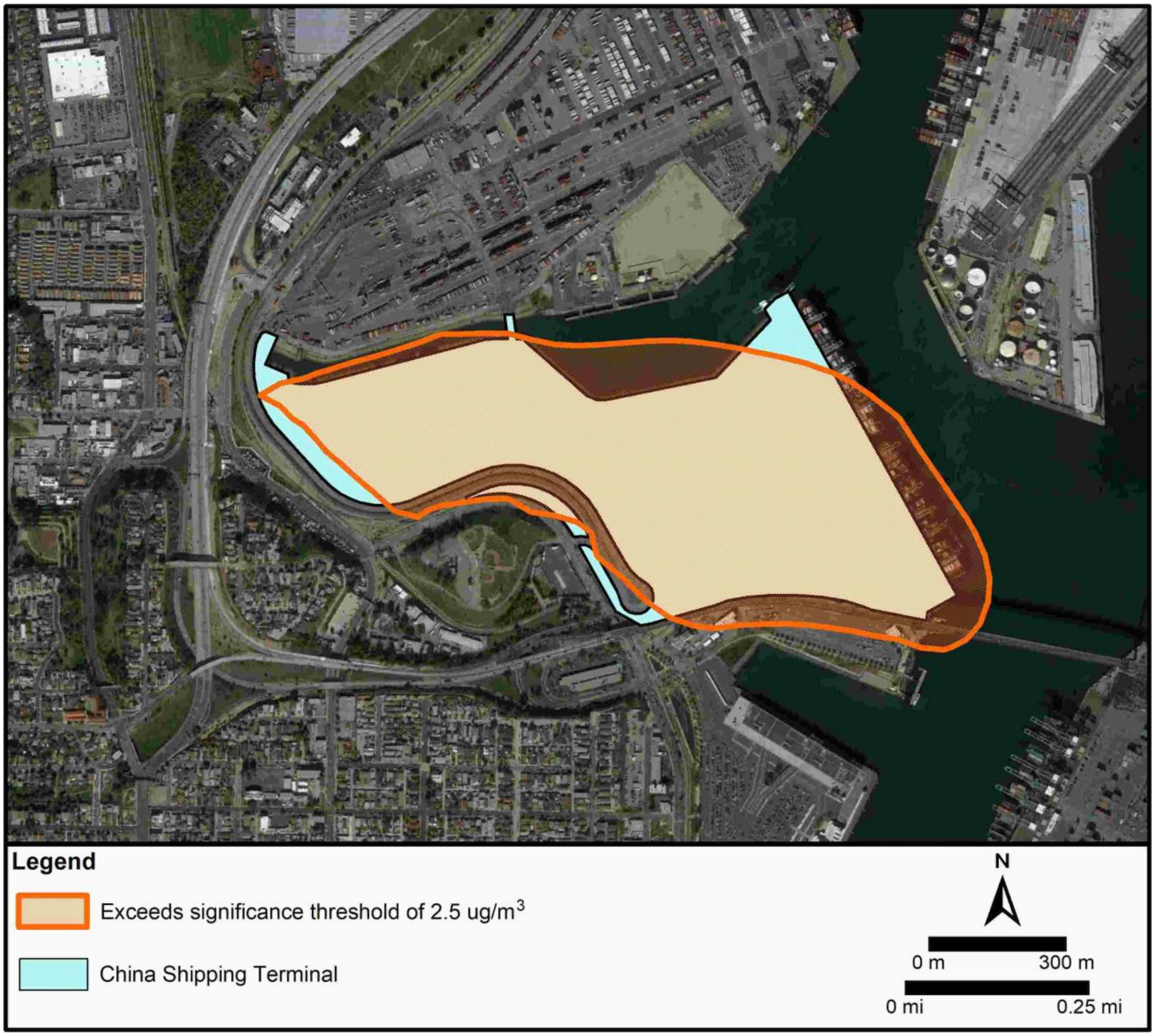


Figure B2-31. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2045 24-Hour PM_{10} Concentration Increments

Figure B2-32. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2014 Annual PM_{10} Concentration Increments

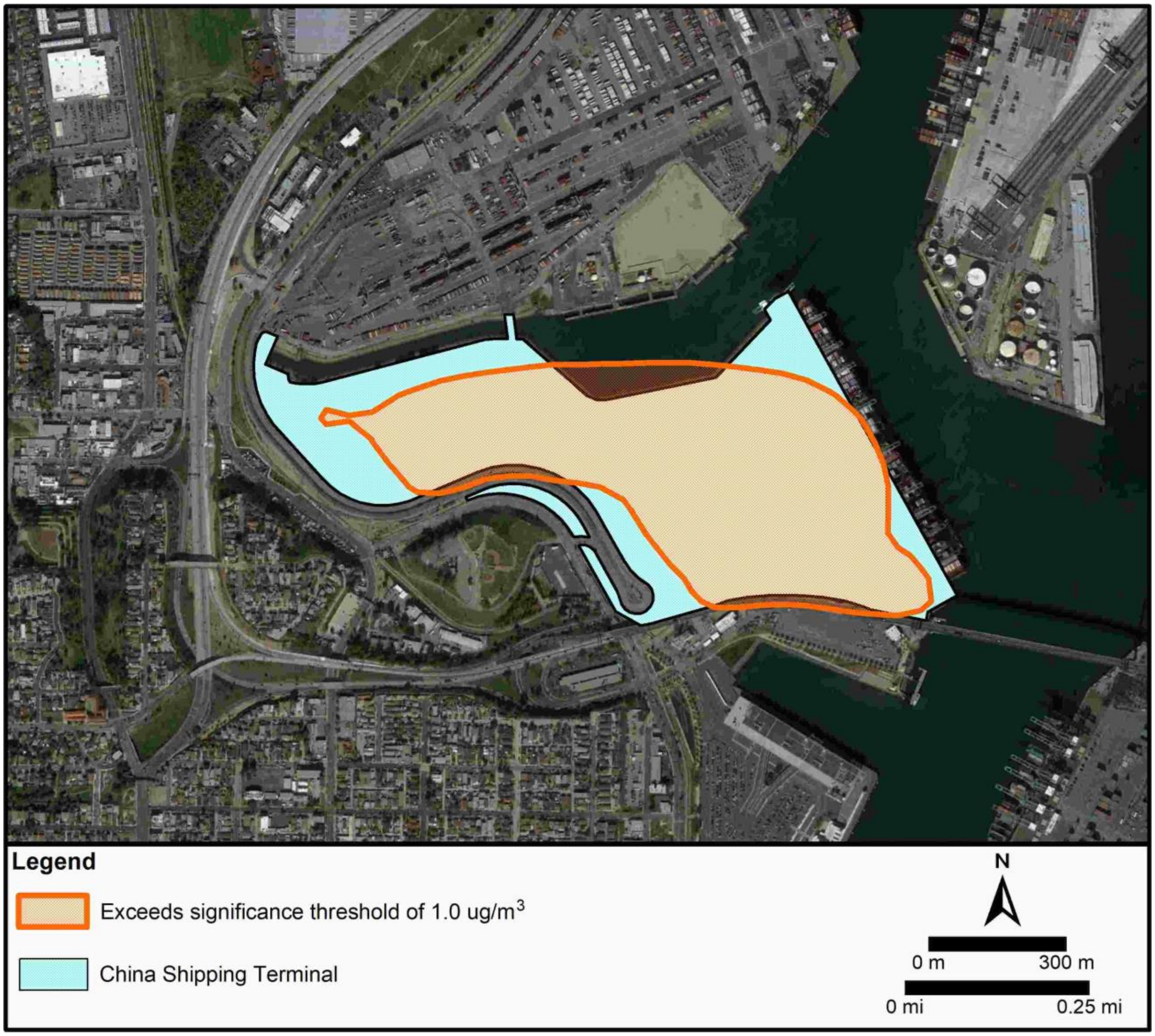


Figure B2-33. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2023 Annual PM_{10} Concentration Increments

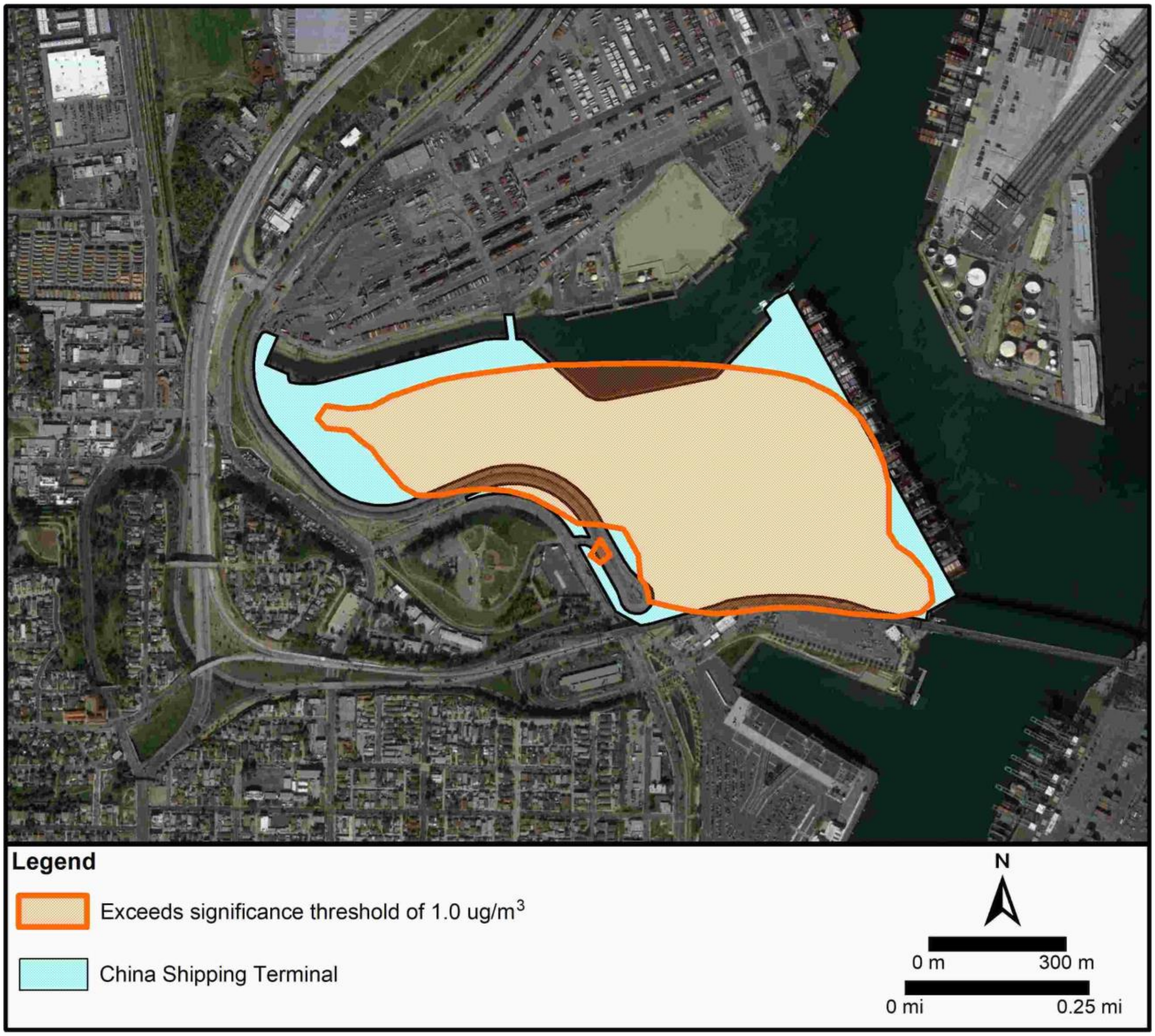


Figure B2-34. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2030 Annual PM_{10} Concentration Increments

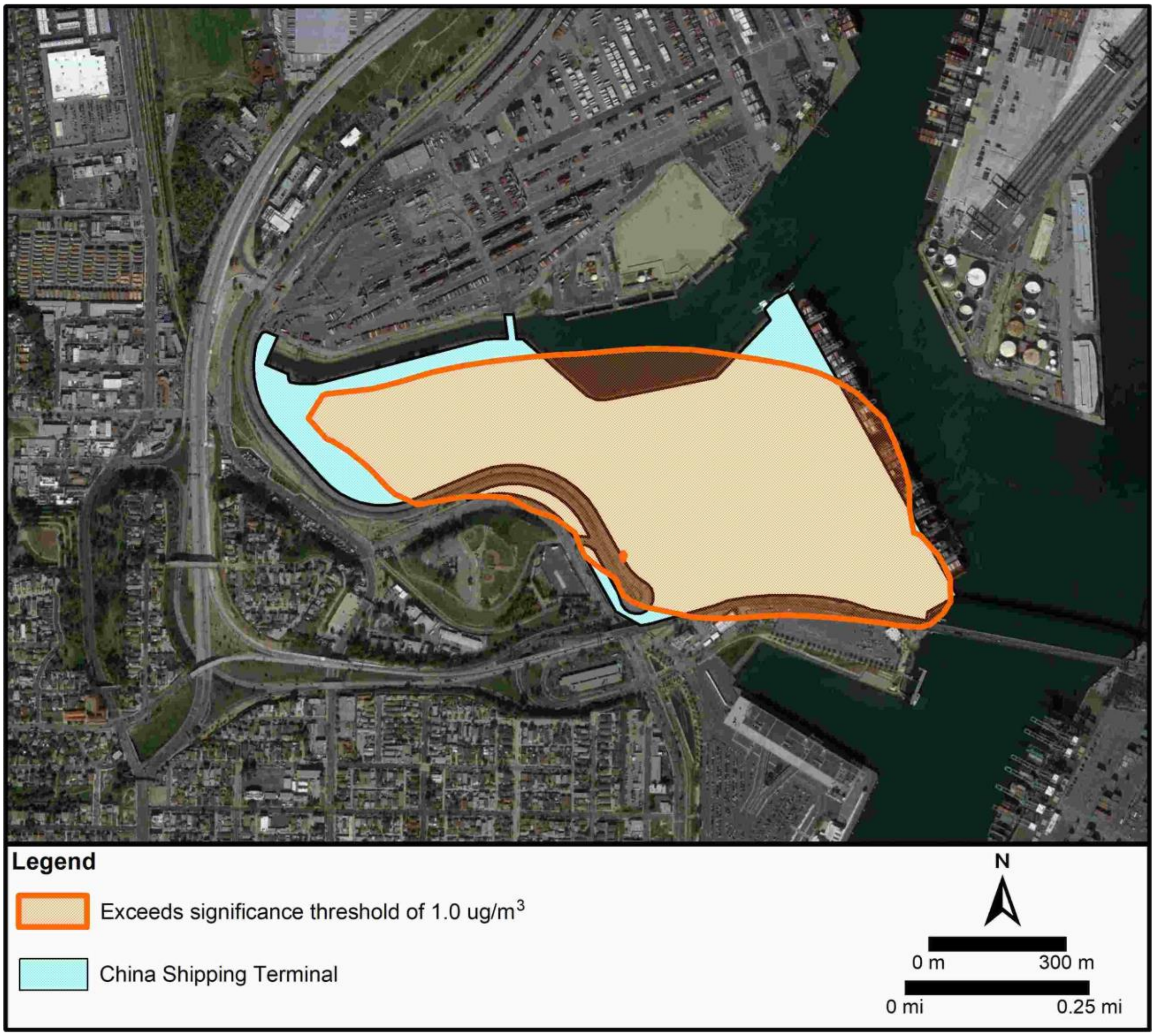


Figure B2-35. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2036 Annual PM_{10} Concentration Increments

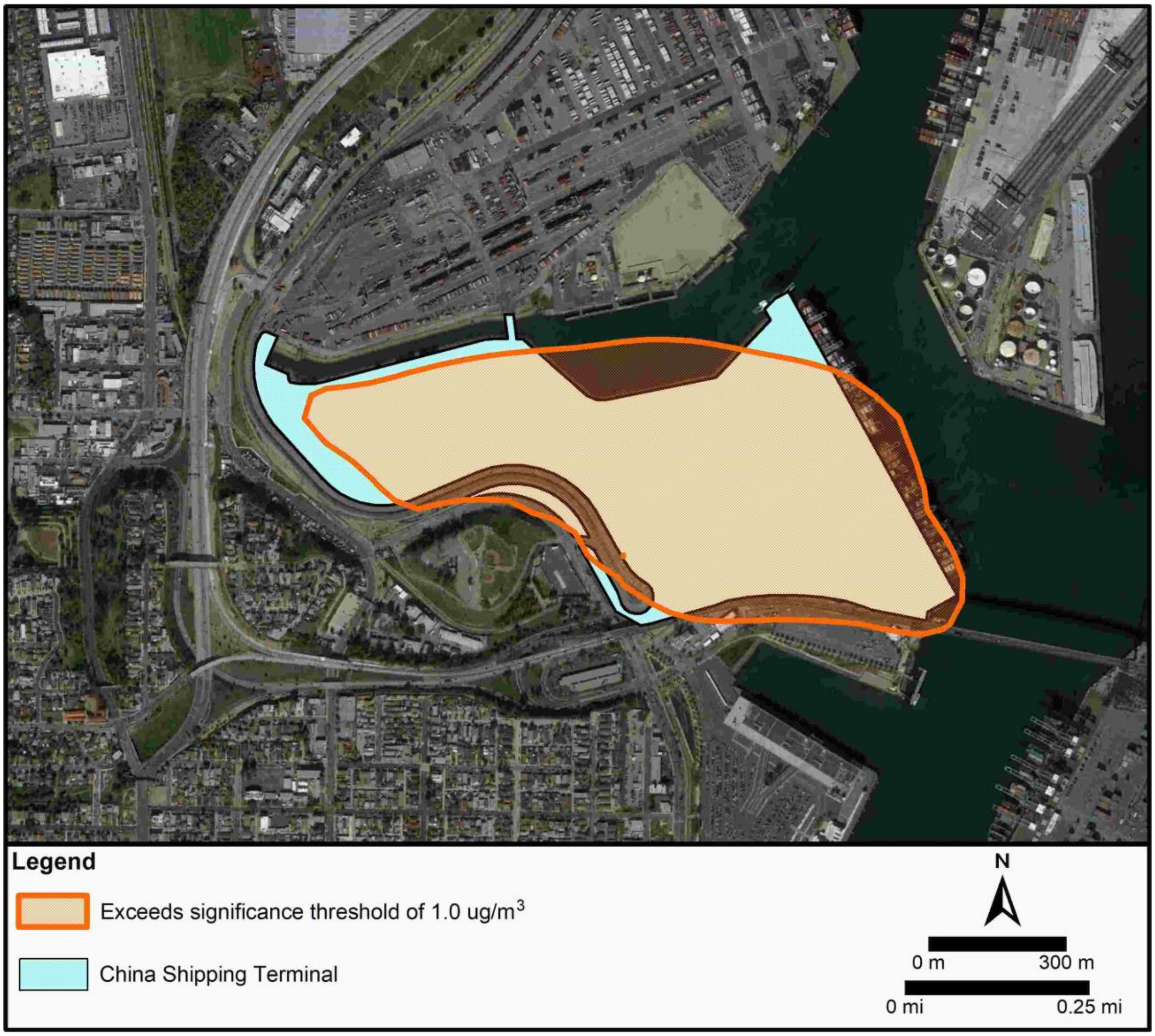
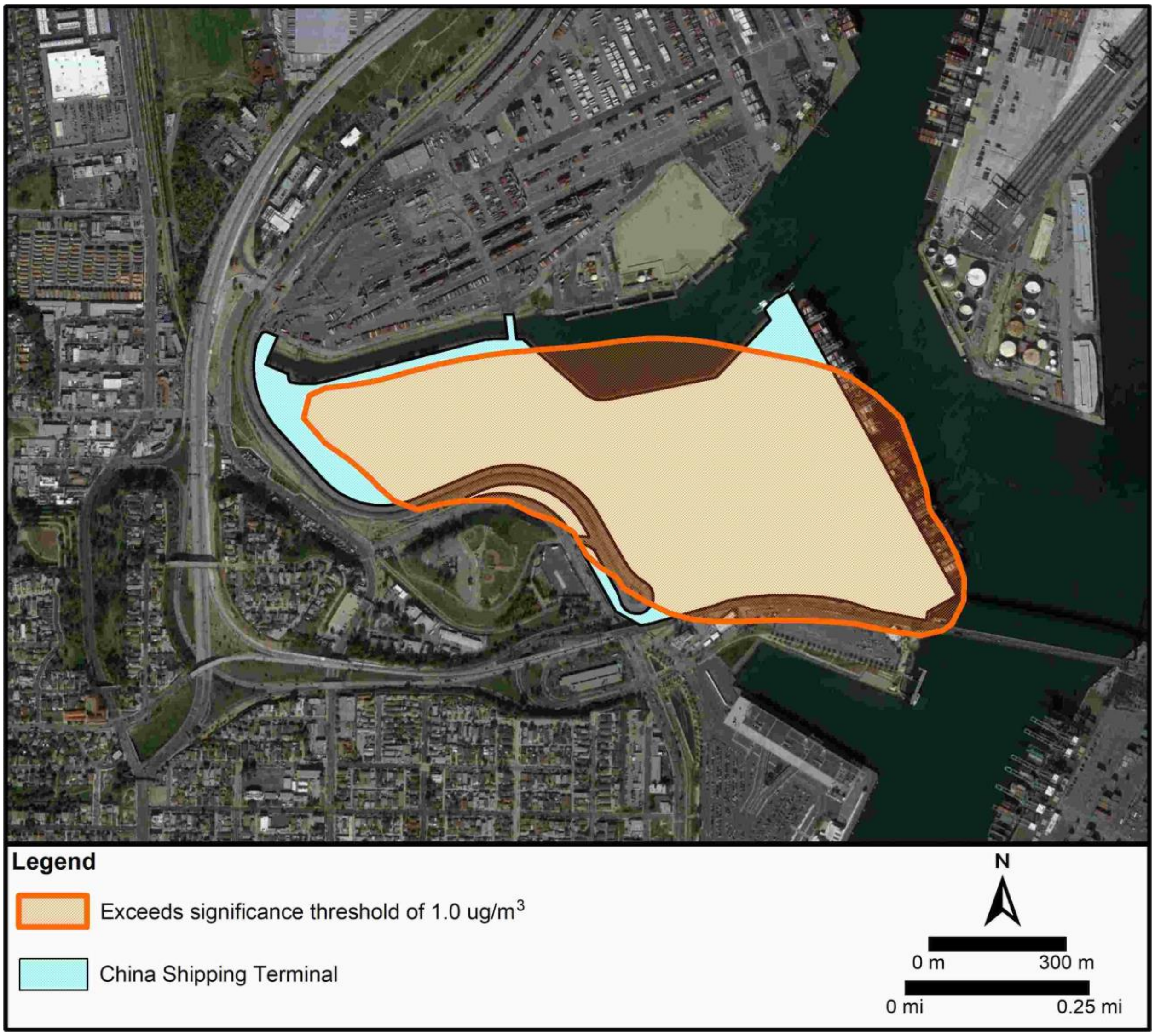


Figure B2-36. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2045 Annual PM_{10} Concentration Increments



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