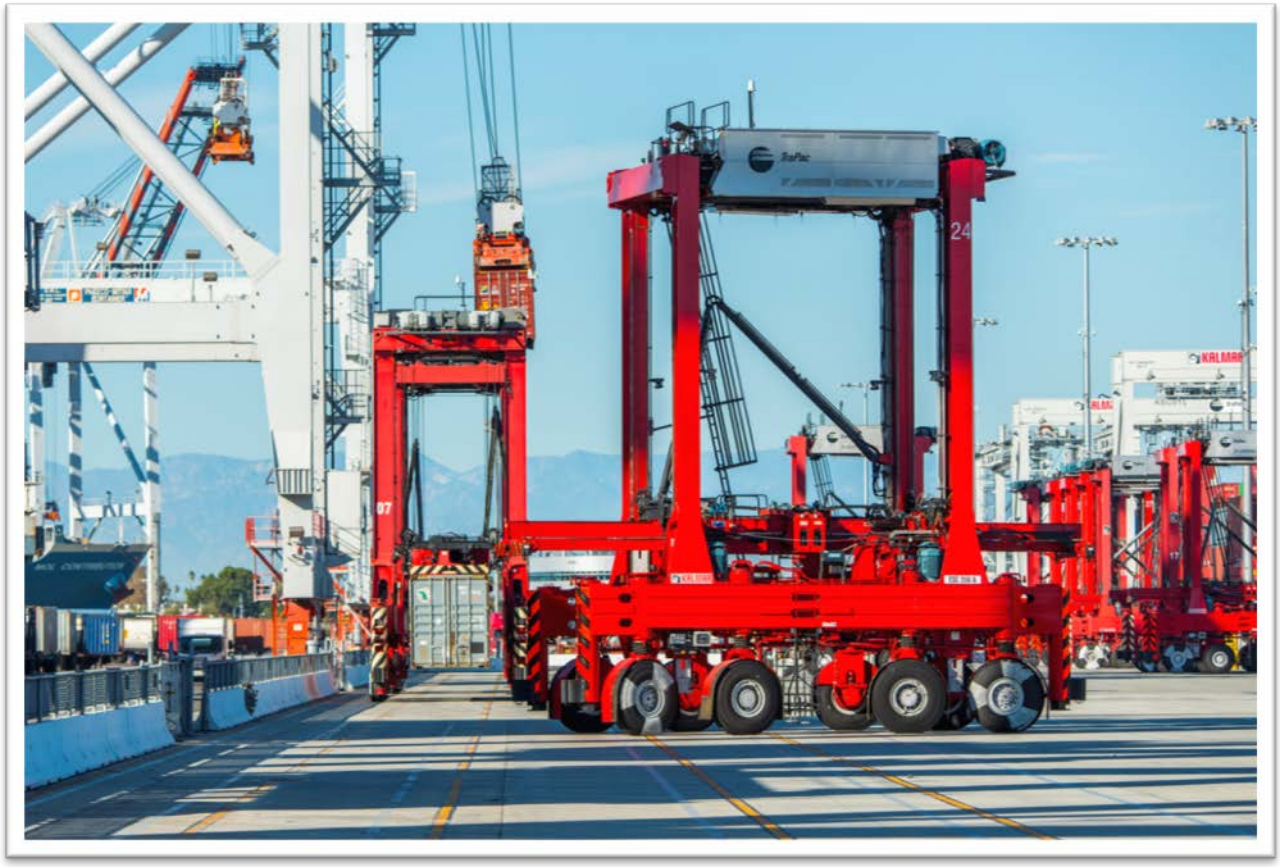
Berth 136-147 [TraPac] Container Terminal Project
Environmental Impact Report Addendum #2

[SCH No. 2003104005, APP No. 150819-102]



Prepared by City of Los Angeles Harbor Department
Environmental Management Division
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1. Background

On December 6, 2007, the Los Angeles Board of Harbor Commissioners (Board) certified in compliance with the California Environmental Quality Act (CEQA) an Environmental Impact Report (EIR) (State Clearinghouse #2003104005) and approved the Berths 136-147 [TraPac] Container Terminal Project for the redevelopment of wharves, deeper berths, terminal backlands improvements, buildings and gates, an on-dock intermodal rail facility, relocation of the Pier A Pacific Harbor Line switching rail yard to Berth 200, improvements to Harry Bridges Boulevard and installation of a buffer area between the terminal and the community. On August 13, 2009, the Board approved TraPac Permit No. 881 (Permit) for a 30-year term for the redevelopment project that would have a capacity of 2.3 million twenty-foot equivalent units (TEUs) and would operate as a container terminal using diesel equipment. The Permit also incorporated all of the tenant mitigation measures adopted in the Final EIR Mitigation Monitoring and Reporting Plan (MMRP) which made TraPac's mitigation requirements effective starting on September 29, 2009.

In February 2011, after construction began, TraPac requested that the Harbor Department modify the scope of the Berths 136-147 [TraPac] Container Terminal Project to allow for electrification of operational equipment in a portion of the terminal to enhance operational efficiencies. The proposed modification would use electric Automated Rail Mounted Gantry Cranes (also known as Automated Stacking Cranes [ASCs]) and Tier 4 diesel hybrid equipment, which are environmentally preferred technologies, rather than the originally planned diesel-fueled Rubber Tire Gantry (RTG) cranes. The scope modification was analyzed in an Addendum to the certified EIR (First EIR Addendum). The Board considered the First EIR Addendum and approved the terminal modifications in the Second Amendment to Permit No. 881 on September 11, 2013. The Board had previously approved the First Amendment to Permit No. 881 in May 2010 related to compensation rates.

The development of the TraPac terminal is in various stages of development as listed below. Many of these improvements have been completed including those covered in the First Addendum as noted below, while others have anticipated future start or completion dates.

- Berth 147 Backland Improvements (Phase 1A – Automation as covered in the First Addendum) – Completed in January 2013
- Berths 145-147 Wharf Improvements (with Alternative Maritime Power shore power or AMP) – Completed in April 2012
- Rear Berths 136-139 Terminal Buildings and Main Gate – Completed in January 2016
- Berths 145-147 Backland Improvements (Phase 1B – Automation as covered in the First Addendum) – Completed in February 2014
- Berths 144-145 Backland Improvements (Phase 1C – Automation as covered in the First Addendum) – Completed in April 2014
- Berths 142-143 Backland Improvements (Phases 2-4 – Automation as covered in the

First Addendum) – In Construction through early 2017
- Berths 142-147 On-Dock Intermodal Container Transfer Facility (Automation as covered in the First Addendum) – In Construction through April 2016
- Berth 142 Crane Maintenance Building – In Construction through mid-2017
- Berths 134-135 Backland Expansion – Started Construction in April 2016

While construction is ongoing and project completion is expected in the first quarter of 2018, TraPac has expressed interest in modernizing and electrifying approximately 25 acres of unmodernized backlands at Berths 136-139 to accommodate additional ASCs, a new crane shop and related improvements. TraPac is seeking to apply its periodic technology review lease measure (also identified as Mitigation Measure AQ-17 in the Final EIR) for incorporating new technological advancements as part of this effort to transition to a fully electrified terminal while phasing out the majority of diesel-powered equipment that was intended for conventional terminal operations. The proposed modernization of the final 25 acres would utilize electric as well as diesel hybrid equipment. The 25-acre modernization would require a new amendment to TraPac's Permit No. 881.

TraPac is also seeking to raise three existing shoreside terminal cranes and lengthen booms presently located at Berth 136. The cranes would be raised 12 feet in height, the length of the back reach would be extended 30 feet and the boom would be extended 13 feet. Upon completion, the three raised shoreside cranes would be immediately relocated to Berths 142-147 to accommodate the larger container vessels that are expected to call at the terminal. Currently, the existing cranes can accommodate up to 12,000 TEU vessels. Raising the cranes and extending the boom would allow the cranes to accommodate 14,000 TEU vessels by "sweeping" the highest and furthest rows/stacks of containers on a vessel.

The Los Angeles Harbor Department (LAHD) has also identified two rail segment improvements that would address bottlenecks in the network serving TraPac and the West Basin Container Terminal. These improvements allow for improved efficiency in train loading/unloading operations and reduce train delays. One of the proposed rail segment improvements is located along the northern edge of the TraPac terminal along Harry Bridges Boulevard. The existing rail line is located outside of TraPac's leasehold immediately adjacent to the south side of Harry Bridges Boulevard. The new rail segment would be placed immediately south of the existing line, within TraPac's current leasehold. As such, implementation of the improvement would require an amendment to TraPac's lease premises to reduce the acreage of their leasehold by 0.85 acres for placement of the new rail segment outside the lease premises. The second rail segment is located on track extending from the Berth 200 railyard, at Henry Ford Avenue near Anaheim Street and the Dominguez Channel.

In addition, given the need to amend TraPac's Permit, the Harbor Department is seeking to correct an error to delete an inapplicable mitigation measure (WQ-3) that was inadvertently included in the Final EIR MMRP.

Lastly, this Second Addendum discloses TraPac's and the Harbor Department's progress in meeting certain mitigation requirements related to air quality and transportation and is provided for informational purposes only in Appendix B.

2. Purpose

The LAHD has prepared this Second EIR Addendum to the TraPac EIR to assess the potential impacts associated with proposed project changes since the Final EIR and the First EIR Addendum. According to Section 15164(a) of the State CEQA Guidelines, the lead agency will prepare an addendum to a previously certified EIR if changes or additions are necessary, but none of the conditions described in Section 15162 calling for the preparation of a subsequent or supplemental EIR have occurred. An addendum need not be circulated for public review but can be included in or attached to the EIR. The decision-making body considers the addendum with the EIR prior to making a subsequent decision on the project.

Section 15162 of the State CEQA Guidelines states that, for a project covered by a certified EIR, preparation of a subsequent or supplemental EIR rather than an addendum is required *only if* one or more of the following conditions occur:

1) Substantial changes are proposed in the project that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

2) Substantial changes occur with respect to the circumstances under which the project is undertaken that will require major revisions of the previous EIR or negative declaration due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects.

3) New information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete or the negative declaration was adopted, shows any of the following:

    a) The project will have one or more significant effects not discussed in the previous EIR or negative declaration;
    b) Significant effects previously examined will be substantially more severe than shown in the previous EIR;
    c) Mitigation measures or alternatives previously found not to be feasible would in fact be feasible and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measure or alternative; or

d) Mitigation measures or alternatives that are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measure or alternative.

None of the conditions requiring preparation of a subsequent or supplemental EIR are met for the proposed Project modifications.

3. Scope and Content

This Second EIR Addendum has been prepared in accordance with the requirements of the California Environmental Quality Act (CEQA) (Public Resources Code [PRC] 21000 et seq.), and the State CEQA Guidelines (California Code of Regulations Title 14, Section1500 et seq.). This addendum describes the affected environmental resources and evaluates the potential changes in the impacts that were previously described in the 2007 Final EIR and the 2012 First Addendum with respect to building and operating the TraPac project.

For purposes of determining whether new or substantially more severe "significant effects" would occur under CEQA Guidelines Section 15162, the criteria for determining whether environmental effects would be significant in this Second Addendum analysis are the same as the significance thresholds contained within the certified EIR and First Addendum.

The analysis in this Second EIR Addendum focuses on the changes to the impacts that would potentially occur as a result of the proposed Project modifications. The scope of analysis contained within this addendum addresses the environmental resource areas that were previously analyzed in the certified EIR. Therefore, the following resource topics were evaluated[1] in preparation of this Second Addendum:

- Aesthetics
- Air Quality and Meteorology
- Biological Resources
- Cultural Resources
- Geology
- Groundwater and Soils
- Hazards and Hazardous Materials
- Land Use
- Noise
- Transportation/ Circulation

[1] The TraPac EIR found that following resource topics had no impacts or less than significant impacts to agricultural resources, mineral resources, and population and housing. The proposed Project modifications evaluated in this Second Addendum would have no impact on these resources, so they are not evaluated further.

- Marine Transportation
- Utilities and Public Services
- Water Quality, Sediments, and Oceanography
- Cumulative Impacts

4. Previous Environmental Documents Incorporated by Reference

Consistent with Section 15150 of the California State CEQA Guidelines, the following documents, available for review at the Port of Los Angeles Environmental Management Division, were used in preparation of this addendum and are incorporated herein by reference:

- Berths 136-147 [TraPac] Container Terminal Draft EIS/EIR, June 2007, (SCH No. 2003104005)
- Berths 136-147 [TraPac] Container Terminal Final EIS/EIR, December 2007, (SCH No. 2003104005)
- Berths 136-147 [TraPac] Container Terminal Mitigation Monitoring Report and Program, December 2007
- First EIR Addendum, Berths 163-147 [TraPac] Container Terminal Project, June 2012 (SCH No. 2003104005)

5. Description of Proposed Project Changes

5.1 Berths 136-139 Backlands Electrification and Modernization

On August 19, 2015, TraPac submitted an Application for Port Permit (APP # 150819-102) to electrify the final 25 acres of traditionally operated backlands which would include repaving approximately 12 acres with concrete and building five ASC runs totaling approximately 4,245 lineal feet including all necessary electrical infrastructure at Berths 136-139. The APP also proposed demolishing the existing crane shop at Berth 137 and construction of a new crane shop at Berth 136. With completion of the improvements outlined in the application, the entire TraPac terminal would be modernized and electrified. The proposed backlands improvements would be commissioned and fully operational by the end of the first quarter of 2018. The newly electrified portion would be operated with electric ASCs and diesel hybrid straddle carriers. ASCs are rail-mounted cranes used for yard-stacking, organizing, and in-stack transportation of containers. The straddle carriers handle both stacking and horizontal transportation of containers and are self-contained and autonomous in terms of navigation. The straddle carriers are deployed in conjunction with the ASCs so that containers are directly transferred from the waterside in the most efficient manner. However, TraPac has indicated that some existing diesel equipment would remain in operation at the terminal as backup or emergency equipment, only to be used less than 10 hours per week for nonscheduled uses based on their estimate of operational needs. The remaining diesel equipment would meet Tier

4 engine standards by 2016, consistent with TraPac's transition plan as described below under Mitigation Compliance Review.

Construction of the proposed improvements would take approximately 21 months to complete. Phase 1 would begin in 2016 and take eight months to complete the construction of the new crane shop, a single story building approximately 6,250 square-feet in size. Phase 2 involves construction of the straddle carrier area and demolition of the existing crane shop, a single-story building approximately 5,000 square-feet in size, which would take five months. Phase 3 involves construction of the ASC block area that would take 13 months. Phases 2 and 3 would start concurrently directly following completion of Phase 1. Phase 2 would begin operation while Phase 3 is still under construction.

As mentioned previously, development of the TraPac terminal is ongoing and certain improvements have already been completed in accordance with the Final EIR and First Addendum. The Final EIR assumed that the terminal could handle a maximum of approximately 2,389,000 TEUs (1,277,540 containers) per year. That maximum capacity is expected to be reached by 2025. Once the development project with the proposed Project modifications become fully operational in 2018, the TraPac terminal would operate in an efficient manner to meet future cargo demand as projected in the Final EIR while using the cleanest and newest equipment and technology.

5.2 Rail Segment Improvements

The Harbor Department is proposing two rail improvements to address bottlenecks in the rail network servicing TraPac and the West Basin Container Terminal (WBCT) on-dock railyards. As documented by a rail study conducted for this Second Addendum (LAHD, March 9, 2016), these segment improvements would decrease train delays and improve the efficiency of the rail network. The total terminal volumes in TraPac and WBCT would not increase as a result of the additional rail trackage. As documented in several previously approved environmental documents,[2] the governing/determinant capacity for the overall terminal is that of either the berth (for TraPac) or container yard (WBCT). Each container terminal has an annual "throughput capacity" (i.e., the anticipated high end of the realistic operating range of containers the terminal can handle in a year). The throughput capacity of a terminal is based on site-specific physical and operational parameters. That number is a function of terminal configuration, berth length, backland area, the ratio of berth length to backland area, and the number and types of equipment in use. Long-term cargo growth forecasts are used as planning tools to understand and predict cargo volumes and Port-related activities for the movement of cargo. Terminal planning involves balancing existing and potential physical and operational

[2] TraPac Container Terminal Project EIR/EIS (December 2007) and its first addendum (2012), and YTI Container Terminal Improvements Project EIR/EIS (November 2014), which included capacity analyses for all terminals in the Port of Los Angeles and Long Beach as part of the traffic and cumulative analyses (refer to Chapter 1 of Draft EIR/EIS .

capacities with market demand projections for cargo. Thus, on-dock railyard capacity and rail switching/staging do not affect the terminal capacity and volume assumed in the aforementioned rail analyses. Thus, the total direct intermodal volumes or total terminal volumes would not change as a result of the track improvements.

The rail segment improvements help achieve the following project objectives as described in the Final EIR:

- [M]odernize existing container terminal facilities at the Port to the extent required to…provide access to land-based rail and truck infrastructure capable of minimizing surface transportation congestion or delays while promoting conveyance to and from both local and distant cargo destinations; and
- Improve or construct container ship berthing and infrastructure

One rail segment involves construction of new track and turnouts along TraPac's northern property line, parallel to and south of Harry Bridges Boulevard, immediately adjacent to an existing rail line between Figueroa Street and Fries Avenue (Construction Phase 4) (Figure 1). The new rail segment would begin at the northern limit of the West Basin Intermodal Container Transfer Facility (ICTF) working tracks, continue immediately to the south of the existing line, and terminate at the existing West Bound 2-2 turnout, within TraPac's leasehold. As such, implementation of the improvement would require an amendment to TraPac's lease premises to slightly reduce the acreage of their leasehold by approximately one acre for placement of the track segment outside the lease premises (Figure 2). The segment would eliminate an existing gap by adding approximately 5,000 linear feet of rail road track extension between the TraPac terminal lead track and San Pedro main line track. The TraPac terminal on-dock rail yard was constructed with stub-ended tracks, which allows operation from only one end of the tracks. This currently requires all inbound trains to first be turned around to enable the front-end locomotives to push the train into the railyard. Inbound TraPac trains can only turn around via the rail loop on Terminal Island which supports the movement of rail and on-dock railyards and is commonly known as the LAXT rail loop (formerly the Los Angeles Export Terminal). This requires the trains to travel from the TraPac terminal to Terminal Island and move across the Badger Avenue Bridge twice, and then be pushed into the yard, or by pulling trains past the adjacent wye west of Fries Avenue onto the single lead track for the WBCT on-dock railyard. The LAXT loop movement causes unacceptable rail system-wide delay. Therefore, the only viable route for inbound trains is via the single WBCT lead track, which inevitably blocks/delays WBCT trains. Outbound TraPac trains need to be pulled out of the yard, and then pushed back onto the single WBCT lead track in order to stay clear of the Henry Ford Ave crossing, thus also blocking/delaying WBCT trains. The proposed rail segment would allow inbound TraPac and WBCT trains to land and store inbound trains in those respective yards, thus reducing delays, and enable outbound TraPac and WBCT trains to be built/staged without blocking inbound trains.

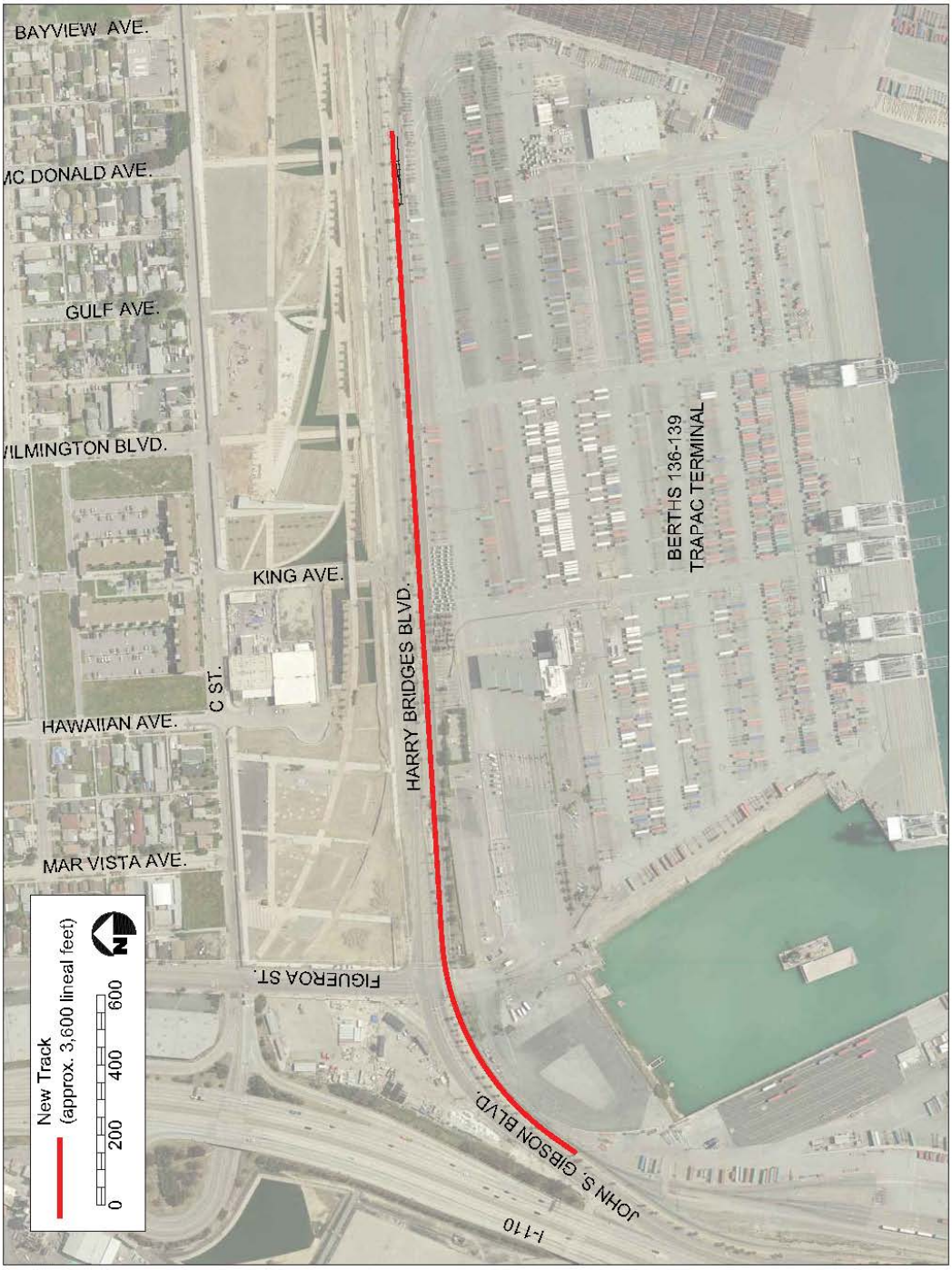
BAYVIEW AVE.
MC DONALD AVE.
GULF AVE.
WILMINGTON BLVD.
KING AVE.
C ST.
HAWAIIAN AVE.
MAR VISTA AVE.
FIGUEROA ST.
HARRY BRIDGES BLVD.
BERTHS 136-139
TRAPAC TERMINAL
JOHN S. GIBSON BLVD.
I-110
New Track
(approx. 3,600 lineal feet)
0
200
400
600
N

FIGURE 1

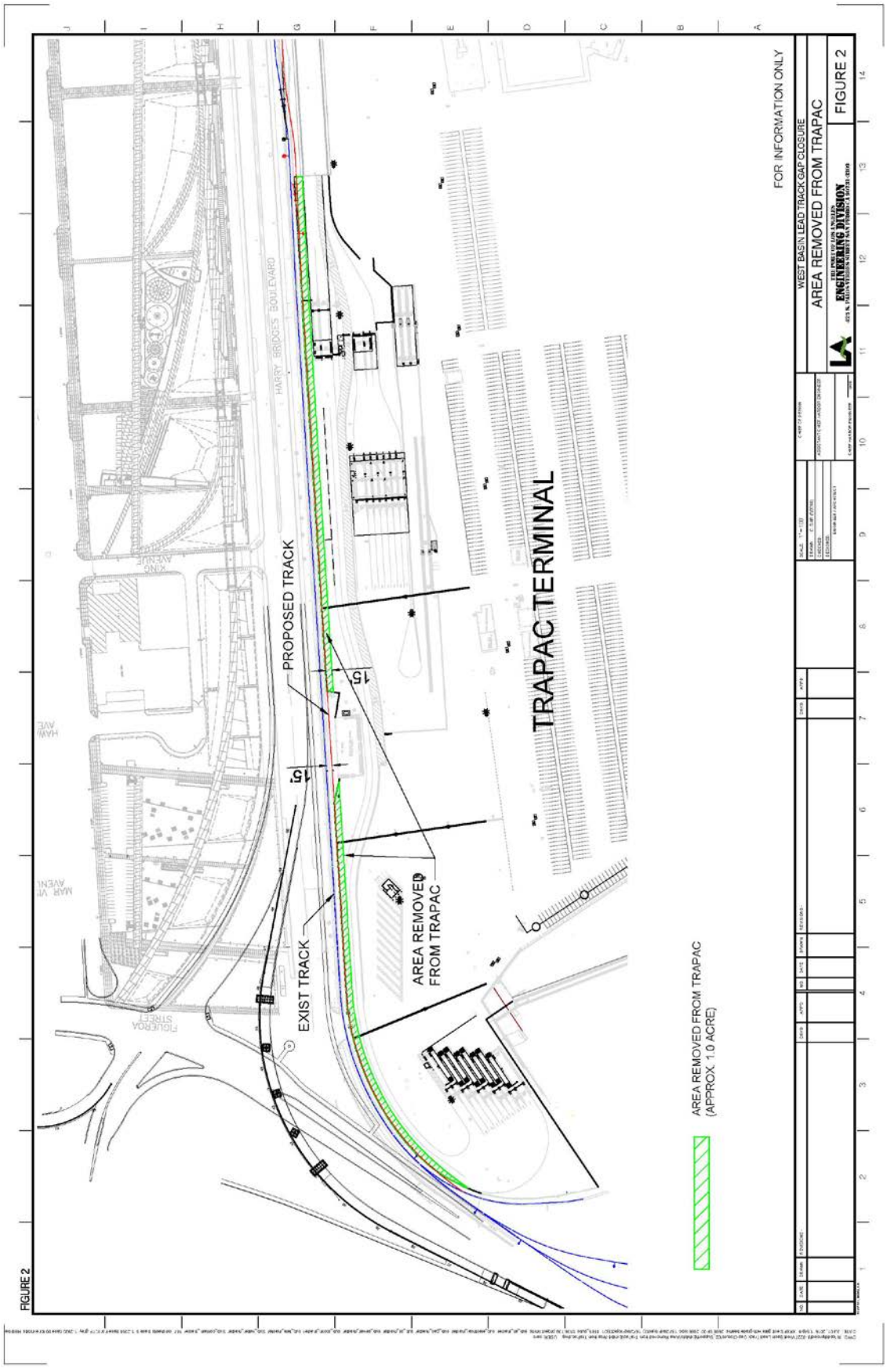
FIGURE 2
FOR INFORMATION ONLY
TRAPAC TERMINAL
PROPOSED TRACK
EXIST TRACK
AREA REMOVED FROM TRAPAC
AREA REMOVED FROM TRAPAC (APPROX 1.0 ACRE)
15'
15'
HARRY BRIDGES BOULEVARD
FIGUEROA STREET
WEST BASIN LEAD TRACK GAP CLOSURE
AREA REMOVED FROM TRAPAC
FIGURE 2

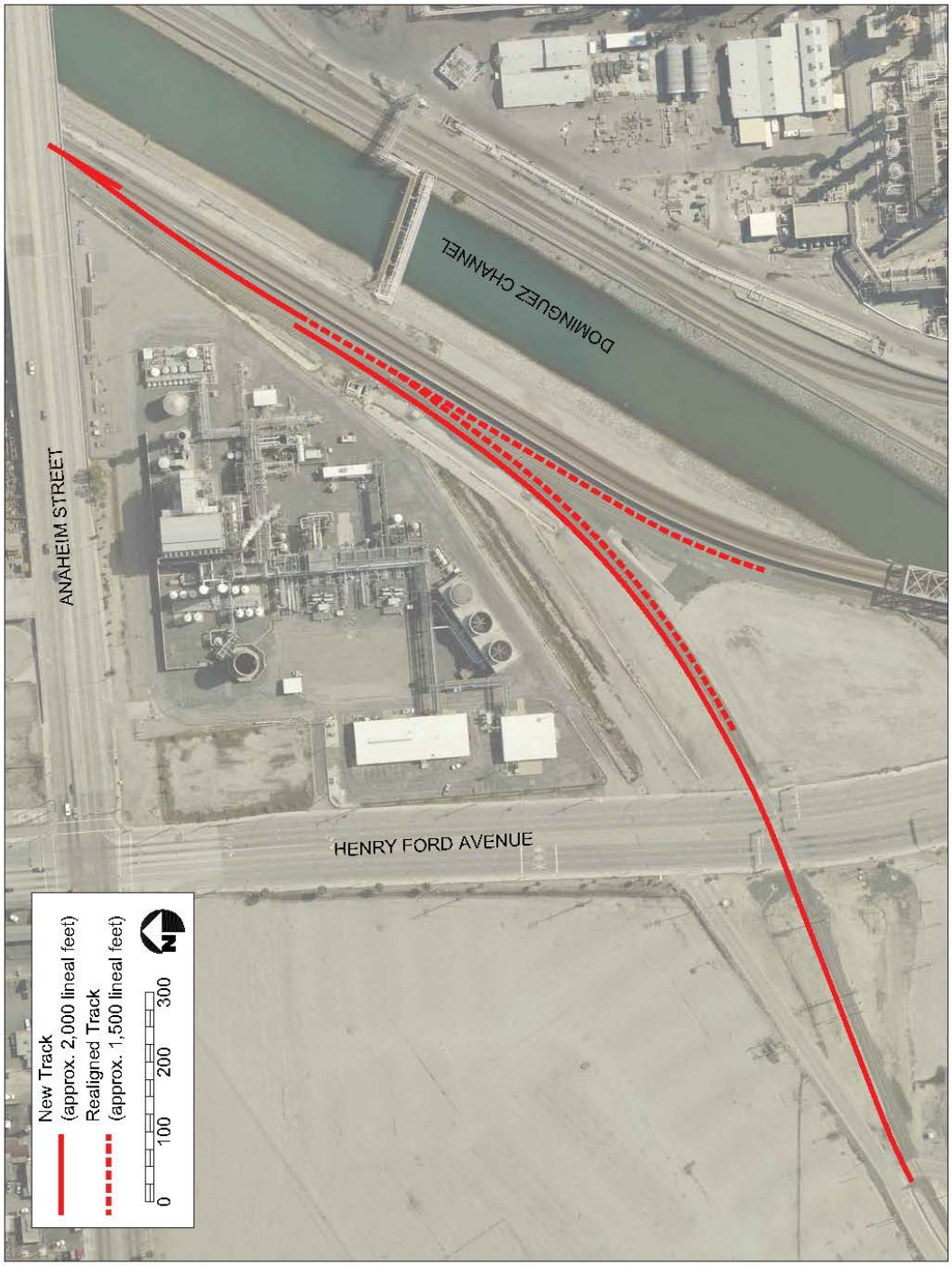
DOMINGUEZ CHANNEL
ANAHEIM STREET
HENRY FORD AVENUE
New Track
(approx. 2,000 lineal feet)
Realigned Track
(approx. 1,500 lineal feet)
0
100
200
300

FIGURE 3

The second rail segment improvement runs on track extending from the Berth 200 railyard, along the Dominguez Channel between Anaheim Street and Henry Ford Avenue (Construction Phase 5) (Figure 3). This improvement involves realignment of approximately 1,500 linear feet of track and construction of approximately 2,000 linear feet of new track, turnouts, and related Centralized Train Control (CTC) signalization improvements, for a total of 3,500 linear feet. This additional trackage will allow simultaneous movements into/out of the West Basin area, and thus will reduce train delays to the TraPac terminal as well as throughout the system.

The Port conducted a detailed rail simulation using the Rail Traffic Controller (RTC) model to quantify the benefits of these rail track improvements (LAHD, March 9, 2016). The RTC model is a program that simulates the movement of trains through rail networks at a detailed and realistic level. It is used for a variety of purposes ranging from the tactical improvement of traffic flow to determining location of capital infrastructure. For this analysis, the most recent estimates of Port on-dock rail yard capacities were used to compute train volumes in the simulation. The capacity computation is based upon various factors including: physical infrastructure characteristics (length and number of tracks), hours of operation; and loading equipment productivity rate. Additionally, train volumes were based upon the following factors: railcar size, railcar utilization rate, TEU factor, number of locomotives, and locomotive length. To simulate a reasonable condition that could occur on a given day under future year 2035 conditions, daily rail volumes were rounded up to the nearest integer, and the longest trains that could move in/out of the rail yards were simulated. Based on the RTC modeling results, the rail road track extension between the TraPac lead track and San Pedro main line track would reduce train delays (moving and idling, in aggregate) by approximately 36 train hours/day, from 120 total hours of delay without the improvement to 84 total hours of delay with the improvement. Similarly, the second rail track across Henry Ford Avenue would reduce train delays (moving and idling, in aggregate) by approximately one hour/day.

5.3 Shoreside Crane Raise

During the preparation of this Second EIR Addendum, TraPac submitted an application (APP #160609-080) on June 9, 2016 to raise three existing shoreside terminal cranes and lengthen booms presently located at Berth 136. The cranes would be raised 12 feet in height, the back reach would be lengthened by 30 feet, and the boom by 13 feet. The new maximum height when the crane is raised at-rest would be 373 feet or 21 feet taller than the old height of 352 feet. Upon completion, the three raised shoreside cranes would be immediately relocated to Berths 142-147 to accommodate the larger container vessels that are expected to call at the terminal. Currently, the existing cranes can accommodate up to 12,000 TEU vessels. Raising the cranes and extending the boom would allow the cranes to accommodate 14,000 TEU vessels by “sweeping” the highest and furthest rows/stacks of containers on a vessel.

Each crane raise would take approximately two months to complete with the first crane raise expected to begin in August 2016, the second crane raise in October 2016 and the third crane raise in December 2016. Construction activities are minimal and only require two personnel

during each crane raise and are therefore, only qualitatively analyzed in this Addendum. The process of raising the cranes would involve torch cutting the tower frame, jacking up the tower frame (through the use of hydraulic jacks and ground support equipment), lifting and positioning frame inserts, and then welding or bolting the inserts onto the frame. The process of extending the boom would begin with removing and lowering the boom to the ground using a barge crane. Once grounded, the boom would be modified through a process similar to the crane raise, and then would be lifted and re-attached to the crane using a barge crane. There would not be any in-water construction or ground-disturbing activities. The project would incorporate modern construction, engineering and safety standards and would require a Harbor Engineer Permit and Coastal Development Permit from the Harbor Department.

Consistent with the findings of the Final EIR Section 1.2.4, the TraPac terminal will have a maximum capacity of 2,389,000 TEUs that is predicted to be reached by 2025 as analyzed in the EIR. Although container throughput and vessel size will increase over time at the terminal, raising the three existing shoreside cranes will not change or increase the capacity of the terminal as detailed below.

The operation of a shoreside crane is typically measured by the number of containers that are loaded or unloaded from a container ship known as “lifts per hour” or “lift rate”. Based on the configuration, a crane that is modified in height and reach could result in a reduced lift rate because the crane would have to travel higher and further out which means greater distance for the crane to operate, thereby resulting in more time and less moves or lifts. Based on a detailed crane productivity analysis conducted by the Port, a modest and conservative reduction of two lifts per hour can be assumed for a crane servicing 14,000 TEU vessels, as compared to the lift rate for a crane servicing 8,000 TEU vessels (APM Terminal Capacity Analysis, 2014, AECOM) and is applicable to a broad range of dock cranes including those being used and modified at TraPac. This reduction is appropriate to assume since it will take more time for the proposed modified cranes to move higher and further out when servicing the larger vessels. The reduced crane productivity rate is supported by input from terminal operators obtained by AECOM, an independent model simulation performed by AECOM, as well as input from TraPac (email correspondence from Scott Axelson, April 26, 2016). The analysis performed shows a reduction in dock crane productivity would result in a reduction in berth capacity. Therefore, the raising of the existing shoreside cranes would not affect the terminal capacity as analyzed in the Final EIR. Furthermore, the Final EIR Section 1.2.4 acknowledged that the ships would increase in size from an average of 5,000 TEU to 10,000 TEUs and even greater as larger vessels enter service, thereby transporting more containers via fewer ships.

5.4 Schedule for Proposed Project Modifications

Table 1 below summarizes the proposed project modifications and construction phasing as analyzed in this Second EIR Addendum.

Table 1. Summary of Proposed Project Modifications and Construction Phasing

Element/Phase	Estimated Start/End Date (for analysis purposes)	
Crane Raise - 3 Existing Shoreside Cranes	8/16/2016	2/15/2017
Berths 136-139 Backlands Electrification and Modernization Phase 1 – New Crane Shop		
Building Construction	9/1/2016	2/28/2017
Architectural Coating	2/1/2017	2/28/2017
Berths 136-139 Backlands Electrification and Modernization Phase 2 - Shuttle Carrier Grounded Area	3/1/2017	7/31/2017
Berths 136-139 Backlands Electrification and Modernization Phase 3 - Automated Blocks	3/1/2017	3/31/2018
Rail Segment Improvement Phase 4 - B142-147 Lead Track Extension (5,000 linear feet)	1/1/2018	9/25/2018
Rail Segment Improvement Phase 5 - Henry Ford Track & Track Realignment (3,500 linear feet)	10/1/2018	2/20/2019

6. Mitigation Erratum and Permit Correction

The Final EIR and TraPac's permit inadvertently included a mitigation measure for a Source Control Program (Mitigation Measure WQ-3, described below) that applies to marine oil terminals but does not apply to non-liquid bulk container terminal operations. This Second Addendum corrects the Final EIR to remove this inapplicable Mitigation Measure WQ-3 from the TraPac project.

6.1 Mitigation Measure WQ-3: Source Control Program

"The tenant shall develop an approved Source Control Program with the intent of preventing and remediating accidental fuel releases. Prior to their construction, the tenant shall develop an approved Source Control Program (SCP) in accordance with Port guidelines established in the General Marine Oil Terminal Lease Renewal Program. The SCP shall address immediate leak detection, tank inspection, and tank repair."

"As a condition of their lease, the tenant will be required to submit to the Port an annual compliance/performance audit in conformance with the Port's standard compliance plan audit procedures. This audit will identify compliance with Regulations and BMPs recommended and implemented to ensure minimizing of spills that might affect water quality, or soil and groundwater."

TraPac is a container terminal and does not operate fuel storage tanks or underground pipelines that would be subject to a Source Control Program under the Marine Oil Terminal

Engineering and Maintenance Standards (MOTEMS) governed by the California State Lands Commission. The MOTEMS guidelines can be found at http://www.slc.ca.gov/Programs/MOTEMS.html. As such, TraPac has been unable to apply this mitigation in its operations. Based on the CEQA Findings contained in the record when the Board certified the EIR and approved the TraPac project, Mitigation Measure WQ-3 was modified as a condition of project approval to address Port-wide efforts related to maintaining high water quality conditions rather than as a mitigation measure to reduce a project-specific impact to water quality. Although this modification was made in the administrative record, Mitigation Measure WQ-3 was not removed from the MMRP to reflect this change. The Final EIR does not describe any components of the Project such as underground pipelines or tanks or any operational activities that would be subject to a Source Control Program which is intended for liquid bulk facilities like a marine oil terminal. Removal of Mitigation Measure WQ-3 from the MMRP is considered an administrative correction of an error, because the measure was not intended to reduce a project-specific impact to water quality and is therefore, not analyzed further in this Second Addendum.

The Final EIR and MMRP contain Mitigation Measure PS-5 which pertains to water conservation. This mitigation was inadvertently excluded from TraPac's permit. This Second Addendum corrects the TraPac project by adding this mitigation to the Permit.

6.2 Mitigation Measure PS-5: Water Conservation Measure

"The new LEED certified administrative building shall incorporate additional water conservation measures, such as lowflow toilets. Additionally, the terminal operator shall plant drought resistant planting and restrict watering to the evening hours."

This mitigation applies to the construction of the building and throughout the tenant's operational years but was erroneously excluded from TraPac's permit when it was approved. Although TraPac is in compliance with this mitigation, it is being recommended that this measure be added into TraPac's permit. This is considered an administrative change and is therefore, not analyzed further in this Second Addendum.

7. Required Permits and Approvals

- Los Angeles Harbor Department Engineering Permit issued by the Chief Harbor Engineer through the Application for Port Permit process for compliance with the Harbor Department and City of Los Angeles standards, when applicable.
- Los Angeles Harbor Department Coastal Development Permit approved by the Board of Harbor Commissioners in accordance with its authority under the Port Master Plan and the California Coastal Act.

- Lease Amendment approved by the Board of Harbor Commissioners and the Los Angeles City Council for the Berths 136-139 Backlands Electrification and Modernization, Rail Segment Improvements, and Mitigation Erratum/Permit Correction.

8. Mitigation Compliance Review

In addition to the proposed Project modifications analyzed in this Second EIR Addendum, a review of mitigation measure compliance is included in Appendix B for disclosure purposes only. The review addresses two air quality mitigation measures and one transportation measure. See Appendix B for more details.

9. Environmental Analysis

The analysis in this Second EIR Addendum focuses on the affected environmental resources and evaluates the potential impacts that would occur as a result of Project modifications compared to those that were previously described and analyzed in the 2007 Final EIR and First EIR Addendum with respect to building and operating the TraPac project. The proposed Project modifications include modernizing and electrifying approximately 25 acres of unmodernized backlands at Berths 136-139 and constructing two rail segment improvements that would address bottlenecks in the network serving TraPac and the West Basin Container Terminal. In addition, the analysis includes the raising of three existing shoreside cranes at the terminal. These changes are assessed in each of the environmental resource areas described below.

9.1 AESTHETICS

Final EIR and First EIR Addendum Conclusions

Aesthetic impacts were discussed in Chapter 3.1 of the Final EIR, which determined that there would be no impacts related to the Project's potential to damage scenic resources within a state scenic highway, create a source of light or glare, or generate significant shading effects. The Final EIR identified one critical view that possessed the qualities to represent a scenic vista, the panoramic view centered to the south from Banning's Landing. None of the original Project components would obstruct this view, as they would be 60 degrees or more towards the west and too peripheral to interfere. Implementation of the original Project would cause no unfavorable and additional contrast with features associated with the aesthetic image of the areas seen from critical public viewing positions. The existing visual character and quality of the site would not be substantially affected, and the Project features would be consistent with all laws, ordinances, regulations, or standards applicable to the protection of features and views of aesthetic/scenic value. Therefore, less than significant aesthetic impacts would result from Project implementation. Accordingly, no mitigation measures were required.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal to enhance operational efficiencies by switching to cleaner zero and near-zero emissions equipment, which are environmentally preferred technologies, did not find any new impacts or increase in severity of previously identified impacts to aesthetics. Electric RMG cranes rather than diesel RTG cranes and the use of diesel electric shuttles to move containers in and out of the stacks from the wharf side gantry cranes to the stacks and/or the on-dock railyard would be built in the same location, would be of similar appearance and scale, and would provide essentially the same function only with cleaner and newer equipment. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

The proposed Project modifications to the Berths 136-147 Container Terminal Improvement Project would not cause any new or substantially more significant impacts related to aesthetic and visual resources than previously addressed in the Final EIR. The existing crane maintenance building will be demolished and the new building will be constructed less than 500 feet to the west of the current location. Both the existing and proposed buildings are single-story structures with the purpose of providing support to marine terminal operations and crane maintenance. The new building is necessary in order to facilitate more efficient operations by eliminating the bottleneck caused by the current location being too close to the landside crane rails during vessel operations at the confluence of three major traffic aisles. Upon completion of demolition and construction, the overall visual character and quality of the container terminal would not be substantially affected.

The other proposed Project modifications include the installation of five ASC modules and the repaving of 12 acres of the terminal to accommodate the Automated Hybrid Straddle Carriers, as well as two minor rail improvements. The repaving and installation of ASC runs would occur at or below ground level and would not create new sources of light or shade and would not adversely affect the visual quality or character of the container terminal. The rail improvements consist of realigning approximately 1,500 feet of existing track and constructing approximately 5,600 feet of track adjacent to existing track in two locations. These improvements would address bottlenecks in the rail network and decrease train delays for TraPac and the West Basin. The Port has an extensive rail network already in place and these rail improvements would not significantly affect public views or alter the industrial visual character of the Project site and its surroundings.

The backland and wharf area where the proposed Project modifications would occur are within two critical views assessed in the EIR: views from Knoll Hill and Shields Drive. The proposed Project modifications are minor in scale compared to the overall Project and would cause no unfavorable and additional contrast with features associated with the valued aesthetic image of the areas seen from critical public viewing positions. Impacts to the visual character of the site would remain less than significant. The Final EIR identified the panoramic view from Banning's

Landing as the only critical view that possesses the qualities to represent a scenic vista. There would be no obstructions of this view by the proposed Project modifications, all of which lie 90 degrees or more toward the west and are too peripheral to interfere. The proposed Project modifications would remain consistent with all applicable rules and regulations regarding features and views of aesthetic or scenic value, including the Port Master Plan, Terminal Lighting Design Guidelines, and the City of Los Angeles General Plan.

The proposed increase in crane height and boom extension would not constitute a visual impact because the proposed change is a modification to existing visual elements in an active industrial port setting rather than an introduction of new elements in the visual landscape. Presently, the crane heights, booms lengths, and massing contribute to the existing visual character of the project area and proposed modifications would be visually consistent with the existing character. From various scenic viewpoints and view sheds analyzed in the EIR, the tops of the existing cranes are already visible from a distance and would remain visible with the proposed raised shoreside cranes.

Therefore, new significant aesthetics impacts or a substantial increase in the severity of previously identified aesthetics impacts would not occur as a result of the proposed Project modifications.

9.2 AIR QUALITY AND GREENHOUSE GASES

Methodology for Proposed Project Modifications

The 2007 Final EIR analyzed air pollutant impacts from the construction and operation of the Berths 136-147 Container Terminal Improvement Project for study years 2008, 2015, 2025, and 2038 to correspond to the timing of when construction was estimated to occur (2008 to 2016) and operations over the 30 year term of the lease. The First EIR Addendum analyzed the electrification of operational equipment in portions of the terminal to enhance operational efficiencies by switching to cleaner zero and near-zero emissions equipment, which are environmentally preferred technologies, and overall found that air pollutant emissions would be significantly reduced compared to the original conclusions in the Final EIR.

The new proposed modifications to the Berths 136-147 Container Terminal Improvement Project, which are the subject of this Second EIR Addendum, include new construction during 2016-2019 and changes to future operations associated with the fully automated terminal, rail improvements, and raised shoreside cranes. The changes to CHE operations on 25 acres of backlands would start to phase in by August 2017 and would be completely phased in by April 2018. The changes to rail operations would be fully realized by March 2019, after completion of the rail segment construction. The changes to ocean-going vessel (OGV) operations associated with the raised shoreside cranes would begin in February 2017.

To determine whether the proposed project modifications would cause any new or substantially more severe significant air quality impacts than previously analyzed in the Final EIR and First EIR Addendum, an air quality analysis was conducted for study years 2016, 2017, 2018, 2019, 2025, and 2038. The analysis compared (a) construction and operational emissions associated with the proposed project modifications to (b) operational emissions associated with the original Berths 136-147 Container Terminal Improvement Project, with mitigation, as analyzed in the Final EIR. Peak daily emissions were analyzed for criteria pollutants, and annual emissions were analyzed for greenhouse gases (GHGs). The potential effects of the proposed project modifications on modeled criteria pollutant ambient concentration impacts and human health risk impacts were also analyzed.

The future emissions calculated for the proposed project modifications include the following (see Tables A-3 through A-11 in Appendix A for detailed calculations):

- Construction emissions associated with the backland improvements (Construction Phases 1, 2, and 3) on approximately 25 acres at Berths 136-139. Based on the proposed construction schedule available at the time the emission calculations were performed, backlands construction is assumed to occur from September 2016 through March 2018. All off-road diesel construction equipment would meet Tier 4 standards.

- Construction emissions associated with building the rail track improvements on approximately 4.5 acres at each of the respective track locations (Construction Phases 4 and 5). Rail construction is assumed to occur from January 2018 through February 2019. All off-road diesel construction equipment would meet Tier 4 standards. Operational emissions associated with decreases in train delays as a result of the rail track improvements were not quantified but are qualitatively analyzed in this Second Addendum.

- Construction emissions for the raised shoreside cranes are qualitatively analyzed due to the limited and temporary nature of activities involved in the process. Each crane raise would be limited to approximately two months and only requires two personnel. The process of raising the cranes would involve torch cutting the tower frame, jacking up the tower frame (through the use of hydraulic jacks and ground support equipment), lifting and positioning frame inserts, and then welding or bolting the inserts onto the frame. The process of extending the boom would begin with removing and lowering the boom to the ground using a barge crane. Once grounded, the boom would be modified through a process similar to the crane raise, and then would be lifted and re-attached to the crane using a barge crane. There would not be any in-water construction or ground-disturbing activities. The shoreside crane raise project would comply with previously approved and applicable Final EIR mitigation measures to reduce emissions during construction. Based on the above, construction emissions are considered minor and are not further analyzed in this Addendum.

- Operational emissions from existing diesel CHE that would continue to operate on the 25-acres of backlands through the first three phases of construction (September 2016 through March 2018). The existing diesel CHE includes yard tractors, RTGs, top handlers, side picks, forklifts, and manlifts. Emissions were estimated by scaling the terminal-wide CHE emissions in the Final EIR by the fraction of backland acreage represented by the newly modernized area (25 acres / 132 total acres). As a result, the emissions assume future year TEU throughputs consistent with the Final EIR. Year 2016-2018 emissions were interpolated from the Final EIR's 2015 and 2025 analysis year emissions. All diesel CHE was assumed to meet Tier 4 standards.

- Operational emissions from 10 new diesel hybrid straddle carriers on the 25-acres of backlands starting August 2017, after completion of Construction Phase 2. Equipment usage rates per TEU were derived from actual usage data for existing straddle carriers operating elsewhere on the TraPac terminal in 2014, the latest complete year of data available at the time of the analysis. The usage rates were scaled to match the TEU projections in the Final EIR for each future analysis year. As a result, the straddle carrier usage rates were estimated to range from 1,025 hours/unit in 2017 (based on 5 months of use) to 3,133 hours/unit in 2038.

- Operational emissions from 7 new electric ASCs on the 25-acres of backlands starting April 2018, after completion of Construction Phase 3. Equipment usage rates at full equipment capacity were provided by TraPac. The usage rates were scaled by the relative TEU projections in the Final EIR for each future analysis year. As a result, the ASC usage rates were estimated to range from 4,446 hours/unit in 2018 (based on 9 months of use) to 7,300 hours/unit in 2038. Because emissions from electricity consumption would be produced at regional power plants, far from the project site, only emissions of GHGs (which exhibit global impacts) were calculated for the electric ASCs in accordance with SCAQMD guidance (SCAQMD, personal communication with S. Nakamura, March 2010).

- Operational emissions from retained diesel CHE, which would operate throughout the TraPac terminal as backup or emergency equipment starting April 2018 (coinciding with the commissioning of the new ASCs after completion of Construction Phase 3). The retained diesel CHE includes 5 yard tractors, 2 top handlers, 2 forklifts, and 3 manlifts. Each unit was assumed to operate 10 hours/week in 2018. The usage rate was conservatively scaled up to 12.3 hours/week by 2025 and 2038, in proportion to the relative TEUs projected in the Final EIR. All retained diesel CHE emissions were conservatively attributed to the electrification/modernization project even though the equipment would actually operate throughout the TraPac terminal. All retained diesel CHE was assumed to meet Tier 4 standards.

The future emissions calculated for the raised shoreside cranes include the following (see Tables A-12, A-13, and A-15 through A-28 in Appendix A for detailed calculations):

- Operational emissions from OGVs transiting to and from, and hoteling at, the TraPac terminal starting in calendar year 2017. The estimated number of vessels visiting the TraPac terminal in future years is consistent with the annual TEU projections in the Final EIR. The mix of vessel sizes was developed from actual 2015 TraPac ship visit data and adjusted to account for the anticipated future influx of 12,000 TEU (12K) and 14,000 TEU (14K) vessels. Specifically, in 2017, it was assumed that 14K vessels would make weekly calls starting in mid-2017, and 12K vessels would make monthly calls starting February 2017. The balance of TEUs in 2017 would be handled by the same mix and proportion of vessels as 2015 (primarily 4K, 5K, 6K, and 8K vessels). In 2025 and 2038, it was assumed that 14K vessels would make weekly calls and 12K vessels would make biweekly calls, with the balance of TEUs handled by 4K and 8K vessels. Peak daily emissions assumed three vessels hoteling simultaneously (14K, 12K, and 8K), plus two one-way arrivals or departures (one 14K and one 12K). In accordance with the *POLA CEQA Terminal Level Container Ship Forecast for Tier 3 Engines* (August 2015), the emission calculations also assumed the gradual introduction of vessels meeting International Maritime Organization (IMO) Tier 1, Tier 2, and Tier 3 engine standards for NOx. Peak day emissions assumed the 8K vessel would be Tier 1 in 2017-2019 and Tier 2 in 2025-2038, and the 12K and 14K TEU vessels would be Tier 2 in 2017-2025 and Tier 3 in 2038. OGV emissions assume full compliance with all mitigation measures in the Final EIR.

The air quality impacts of the proposed project modifications were assessed by comparing future year emissions (calculated as described above) to the future year operational emissions associated with the original Berths 136-147 Container Terminal Improvement Project, with mitigation, as analyzed in the Final EIR. The following emissions for the Berths 136-147 Container Terminal Improvement Project were obtained from the Final EIR (see Tables A-1, A-2, and A-14 in Appendix A for detailed calculations):

- Operational emissions from diesel CHE on 25 acres of backlands. The CHE includes yard tractors, RTGs, top handlers, side picks, forklifts, and manlifts. Emissions were obtained by scaling the mitigated terminal-wide CHE emissions in the Final EIR by the fraction of backland acreage represented by the newly modernized area (25 acres / 132 total acres). As a result, the emissions assume future year TEU throughputs consistent with the Final EIR. Years 2016-2019 emissions were interpolated from the Final EIR's 2015 and 2025 analysis year emissions. All diesel CHE was assumed to meet Tier 4 standards, in accordance with Final EIR mitigation measures AQ-7 and AQ-8.

- Operational emissions from OGVs transiting to and from, and hoteling at, the TraPac terminal starting in calendar year 2017. The mix of vessel sizes in the Final EIR ranged from <3K to a maximum size of 8K-9K in all analysis years. Peak daily emissions assumed three vessels hoteling simultaneously (3K-5K, 5K-6K, and 8K-9K), plus two one-way

arrivals or departures (both by an 8K-9K vessel). The Final EIR did not account for the penetration of IMO Tier 1-3 vessels into the fleet in future years. OGV emissions assume full compliance with all mitigation measures in the Final EIR.

Final EIR and First EIR Addendum Conclusions

Table 2 shows a summary of peak daily criteria pollutant and annual GHG emissions for the entire Berths 136-147 Container Terminal Improvement Project, with mitigation, as analyzed in the Final EIR for study years 2008, 2015, 2025, and 2038. Emission sources include CHE throughout the entire terminal, OGVs, harborcraft, locomotives, and drayage trucks. GHG emissions are expressed as carbon dioxide equivalent (CO2e). The project impact represents the CEQA increment (project minus 2003 CEQA baseline) for mitigated project operations. Construction emissions are not included in the table because no changes are being made in this Second EIR Addendum to the construction elements that were approved with the Final EIR. The only construction emissions that are considered in this Second EIR Addendum are the new emissions that would occur during construction of the electrification/modernization improvements (shown in Table 3).

For criteria pollutants (Impact AQ-3 in the Final EIR), Table 2 shows that the mitigated proposed project in the Final EIR would exceed South Coast Air Quality Management District (SCAQMD) thresholds for NOx, SOx, and VOC in 2008, resulting in significant impacts. Emissions of PM10 and PM2.5 would increase relative to the CEQA baseline in 2008, but would remain below the significance thresholds, resulting in less than significant impacts. Emissions of CO would decrease relative to the CEQA baseline in 2008, resulting in a less than significant impact. In 2015, 2025, and 2038, all criteria pollutant emissions would decrease substantially compared to the 2003 CEQA baseline, resulting in less than significant impacts. GHG emissions (Impact AQ-8 in the Final EIR) would be above the significance threshold in each study year, resulting in a significant and unavoidable impact.

Table 2. Terminal-Wide Emission Impacts from the 2007 Final EIR

Description	PM10 (lb/day)	PM2.5 (lb/day)	NOx (lb/day)	SOx (lb/day)	CO (lb/day)	VOC (lb/day)	CO2e (MT/yr)
Year 2008							
Project Emissions	1,668	1,348	26,255	5,055	6,728	2,063	381,901
CEQA Baseline Emissions	1,607	1,329	23,010	3,851	6,935	1,977	305,073
Project Impact	61	19	3,244	1,205	-207	85	76,829
SCAQMD Thresholds	150	55	55	150	550	55	10,000
Significant?	No	No	Yes	Yes	No	Yes	Yes
Year 2015							
Project Emissions	616	304	8,346	1,450	5,060	915	569,364
CEQA Baseline Emissions	1,607	1,329	23,010	3,851	6,935	1,977	305,073
Project Impact	-991	-1,025	-14,665	-2,401	-1,875	-1,062	264,291
SCAQMD Thresholds	150	55	55	150	550	55	10,000

Significant?	No	No	No	No	No	No	Yes
Year 2025							
Project Emissions	694	333	8,847	1,438	6,170	772	699,175
CEQA Baseline Emissions	1,607	1,329	23,010	3,851	6,935	1,977	305,073
Project Impact	-913	-995	-14,163	-2,413	-765	-1,205	394,102
SCAQMD Thresholds	150	55	55	150	550	55	10,000
Significant?	No	No	No	No	No	No	Yes
Year 2038							
Project Emissions	681	322	8,631	1,438	6,162	761	699,445
CEQA Baseline Emissions	1,607	1,329	23,010	3,851	6,935	1,977	305,073
Project Impact	-925	-1,007	-14,379	-2,413	-773	-1,216	394,372
SCAQMD Thresholds	150	55	55	150	550	55	10,000
Significant?	No	No	No	No	No	No	Yes

Notes:

1. Source: Final EIR Tables 3.2-26 and 3.2-34 (operational emissions associated with the mitigated proposed Project).
2. Project Impact = Project Emissions minus CEQA Baseline Emissions. Project Emissions include mitigation measures prescribed in the Final EIR. CEQA Baseline Emissions represent actual emissions in year 2003.
3. MT/yr = metric tons (1,000 kilograms) per year.

In terms of modeled ambient pollutant concentrations (Impact AQ-4 in the Final EIR), the Final EIR predicted that maximum off-site concentrations of NO2 (1-hour and annual), PM10 (24-hour), and PM2.5 (24-hour) would exceed significance thresholds after mitigation. Maximum concentrations of CO would be less than significant. The modeling analysis was performed for mitigated project emissions in year 2010, which was determined in the Final EIR to produce the highest off-site ambient pollutant impacts.

In terms of human health risk (Impact AQ-6 in the Final EIR), the Final EIR predicted that the incremental health risks of the mitigated proposed project (after subtracting the CEQA baseline health risks) would be less than significant at all off-site receptors. The HRA modeled cancer risk based on mitigated project emissions over a 70-year exposure period, 2007-2076. The HRA modeled chronic and acute noncancer hazard indices based on mitigated project emissions in year 2010, which was determined in the Final EIR to produce the highest off-site ambient pollutant impacts.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal to enhance operational efficiencies by switching to cleaner zero and near-zero emissions equipment, which are environmentally preferred technologies, did not find any new impacts or increase in severity of previously identified impacts to air quality. Electric RMG cranes rather than diesel RTG cranes and the use of diesel electric shuttles to move containers in and out of the stacks from the wharf side gantry cranes to the stacks and/or the on-dock railyard would be built in the same location, would be of similar appearance and scale, and would provide essentially the same function only with cleaner and newer equipment. As a result, the First Addendum found that overall emissions would be significantly lower than what

was predicted in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Therefore, the First Addendum air quality impact analysis is qualitatively described here and the impact analysis below primarily compares the air quality impacts of the proposed Project modifications to the air quality impacts disclosed in the Final EIR.

Proposed Project Modifications

Berths 136-139 Backlands Electrification/Modernization and Rail Improvements

Table 3 presents the future peak daily criteria pollutant and annual CO2e emissions associated with the electrification/modernization project for analysis years 2016-2019, 2025, and 2038. The emissions include construction on 25 acres of backlands, construction of the rail improvements, and operation of existing and proposed new CHE on 25 acres of backlands. Construction would occur together with operations during years 2016-2019. The diesel hybrid straddle carriers would begin operating in 2017, and the electric ASCs would begin operating in 2018. Existing diesel CHE is conservatively assumed to continue operating on the 25 acres of backlands until 2018, when both the straddle carriers and ASCs become operational. Years 2025 and 2038 reflect the fully operational electrification/modernization project, after all construction is complete.

Table 3 also compares the emissions associated with the electrification/modernization and rail improvements to the CHE emissions in the 2007 Final EIR, and determines the net change in emissions relative to the Final EIR for each analysis year. To provide for a proper comparison, operational emissions for both scenarios are based on the future TEU projections in the Final EIR, prorated to 25 acres of backlands and interpolated where necessary to the various analysis years. All equipment is assumed to comply with the mitigation measures in the Final EIR.

Table 3 shows that, in 2016-2018, emissions associated with the proposed electrification/modernization and rail improvements would be greater than the Final EIR for all criteria pollutants and CO2e. This temporary increase in emissions relative to the Final EIR is caused by the construction emissions combining with the existing CHE operational emissions during this period. In 2019, emissions associated with the proposed electrification/modernization project would be less than the Final EIR for all pollutants except PM10 and PM2.5, indicating that the emission reductions from the new hybrid and electrified equipment are more than offsetting the construction emissions for most pollutants by this time. In 2025 and 2038, after construction is complete, the emissions associated with the proposed electrification/modernization project would be less than the Final EIR for all pollutants, indicating that the replacement of diesel CHE with hybrid and fully electric equipment would result in an emissions benefit for all analyzed pollutants. The accumulated criteria pollutant and GHG emissions over the lifetime of the electrification/modernization project would be greatly reduced by electrifying the 25 acres compared to continued operations using diesel CHE.

Table 3. Construction and Operational Emissions Associated with the Proposed Backlands Electrification/Modernization and Rail Improvements

Analysis Year	Equipment	Peak Daily Criteria Pollutant Emissions (lb/day)						Annual CO2e (MT/yr)
		PM10	PM2.5	NOx	SOx	CO	VOC	
2016	Construction	3.7	1.1	12.6	0.1	44.7	2.3	370
	Existing Diesel CHE	3.3	3.0	64.4	0.9	428.3	52.5	1,465
	Total from Proposed Electrification/Modernization/Rail	7.0	4.1	77.0	1.0	473.0	54.8	1,834
	Total from Final EIR (CHE operation on 25 acres)	3.3	3.0	64.4	0.9	428.3	52.5	1,465
	Emissions Impact Relative to Final EIR	3.7	1.1	12.6	0.1	44.7	2.3	370
2017	Construction	4.3	2.0	28.4	0.3	139.9	8.4	2,929
	Existing Diesel CHE	3.4	3.1	66.4	0.9	439.5	49.5	4,674
	Hybrid Straddle Carriers	0.0	0.0	0.0	0.2	88.0	0.0	277
	Total from Proposed Electrification/Modernization/Rail	7.7	5.0	94.9	1.4	667.4	57.9	7,880
	Total from Final EIR (CHE operation on 25 acres)	3.4	3.1	66.4	0.9	439.5	49.5	4,674
	Emissions Impact Relative to Final EIR	4.3	2.0	28.4	0.5	227.9	8.4	3,207
2018	Construction	5.7	2.3	62.6	0.3	93.2	4.4	2,764
	Existing Diesel CHE	3.5	3.2	68.5	0.9	450.8	46.6	1,238
	Hybrid Straddle Carriers	0.3	0.3	8.7	0.2	98.0	2.7	688
	Automated Stacking Cranes	--	--	--	--	--	--	2,411
	Retained Diesel CHE	0.0	0.0	0.0	0.0	0.0	0.0	256
	Total from Proposed Electrification/Modernization/Rail	9.5	5.7	139.8	1.5	642.0	53.7	7,357
	Total from Final EIR (CHE operation on 25 acres)	3.5	3.2	68.5	0.9	450.8	46.6	4,953
	Emissions Impact Relative to Final EIR	6.0	2.6	71.3	0.5	191.2	7.1	2,404
2019	Construction	8.8	3.0	49.9	0.3	110.6	4.3	234
	Hybrid Straddle Carriers	0.4	0.3	9.1	0.2	105.2	3.5	710
	Automated Stacking Cranes	--	--	--	--	--	--	3,321
	Retained Diesel CHE	0.2	0.2	4.2	0.1	20.9	1.8	353
	Total from Proposed Electrification/Modernization/Rail	9.3	3.5	63.2	0.6	236.7	9.5	4,618
	Total from Final EIR (CHE operation on 25 acres)	3.6	3.3	70.6	1.0	462.0	43.7	5,233
	Emissions Impact Relative to Final EIR	5.8	0.3	-7.4	-0.4	-225.3	-34.2	-615
2025	Hybrid Straddle Carriers	0.5	0.4	10.0	0.2	120.2	4.9	847
	Automated Stacking Cranes	--	--	--	--	--	--	3,060
	Retained Diesel CHE	0.2	0.2	4.4	0.1	21.9	1.8	421
	Total from Proposed Electrification/Modernization/Rail	0.6	0.6	14.4	0.3	142.1	6.7	4,327

	Total from Final EIR (CHE operation on 25 acres)	4.2	3.9	83.0	1.2	529.4	26.2	6,912
	Emissions Impact Relative to Final EIR	-3.5	-3.3	-68.6	-0.8	-387.3	-19.5	-2,585
2038	Hybrid Straddle Carriers	0.5	0.4	10.0	0.2	120.2	4.9	847
	Automated Stacking Cranes	--	--	--	--	--	--	3,060
	Retained Diesel CHE	0.2	0.2	4.4	0.1	21.9	1.8	421
	Total from Proposed Electrification/Modernization/Rail	0.6	0.6	14.4	0.3	142.1	6.7	4,327
	Total from Final EIR (CHE operation on 25 acres)	4.2	3.9	83.0	1.2	529.4	26.2	6,912
	Emissions Impact Relative to Final EIR	-3.5	-3.3	-68.6	-0.8	-387.3	-19.5	-2,585

Notes:

1. Year 2016 emissions cover September - December (4 months) only, to align with the start of construction.
2. Year 2017 proposed annual emissions include 2 months of Construction Phase 1 (Jan - Feb), 5 months of Construction Phase 2 (Mar - Jul), 10 months of Construction Phase 3 (Mar - Dec), 12 months of operation of the existing diesel CHE, and 5 months of operation of the hybrid straddle carriers (Aug - Dec). Year 2017 peak daily emissions of PM10, PM2.5, and NOx would occur during the combination of construction Phases 2 and 3, and operation of existing diesel CHE (Mar-Jul). Year 2017 peak daily emissions of SOx and CO would occur during the combination of construction Phase 3, operation of existing diesel CHE, and operation of the hybrid straddle carriers (Aug-Dec). Year 2017 peak daily emissions of VOC would occur during the combination of construction Phase 1, and operation of existing diesel CHE (Jan-Feb).
3. Year 2018 proposed annual emissions include 3 months of Construction Phase 3 (Jan - Mar), 9 months of Construction Phase 4 (B-142-147 Lead Rail Track, Jan - Sep), 3 months of Construction Phase 5 (Henry Ford Track and Track Realignment, Oct - Dec), 3 months of operation of the existing diesel CHE (Jan - Mar), 12 months of operation of the straddle carriers; and 9 months of operation of the automated stacking cranes and retained diesel equipment (Apr - Dec). Year 2018 peak daily emissions of all criteria pollutants would occur during the combination of construction Phases 3 and 4, operation of existing diesel CHE, and operation of the hybrid straddle carriers (Jan-Mar).
4. Year 2019 proposed annual emissions include 2 months of Construction Phase 5 (Jan - Feb), and 12 months of operation of the straddle carriers, automated stacking cranes, and retained diesel CHE. Year 2019 peak daily emissions of all criteria pollutants would occur during the combination of construction Phase 5, operation of the hybrid straddle carriers, and operation of retained diesel CHE (Jan-Feb).
5. Year 2025 and 2038 annual emissions assume the straddle carriers, automated stacking cranes, and retained diesel CHE operate for the entire year.
6. Operational emissions for both the Proposed Electrification/Modernization and the Final EIR are based on the throughput projections in the Final EIR, scaled to the 25-acre backlands area (i.e., terminal-wide TEU throughput x 25 acres / 132 total backlands acreage).
7. All emissions assume compliance with the mitigation measures in the Final EIR. Construction emissions assume all offroad equipment would meet Tier 4 standards.
8. The analysis for operational emissions is conservative in that it does not quantify the reduction in train delays from the railroad track improvements.
9. Because emissions from electricity consumption would be produced at regional power plants, far from the project site, only emissions of GHGs (which exhibit global impacts) were calculated for the electric ASCs.
10. MT/yr = metric tons (1,000 kilograms) per year.
11. CO2e = carbon dioxide equivalent = (CO2 x 1) + (N2O x 298) + (CH4 x 25). Source: POLA 2014 EI, which used IPCC Fourth Assessment Report (AR4) Global Warming Potentials.

Shoreside Crane Raise

Table 4 presents the future peak daily criteria pollutant and annual CO2e emissions associated with the crane raise project for analysis years 2017-2019, 2025, and 2038. The emissions include OGV transit between the terminal and SCAQMD overwater boundary, and OGV hoteling at the terminal. The maximum vessel size calling at the terminal is assumed to be 14K TEU, compared to 8K-9K TEU for the Final EIR.

Table 4 also compares the OGV emissions with the crane raise project to the OGV emissions in the 2007 Final EIR, and determines the net change in emissions relative to the Final EIR for each analysis year. To provide for a proper comparison, emissions for both scenarios are based on the future TEU projections in the Final EIR. Emissions assume compliance with the mitigation measures in the Final EIR.

Table 4 shows that, in 2017-2019 and 2025, OGV emissions with the crane raise project would be greater than the Final EIR for NOx and VOC, and less than the Final EIR for PM10, PM2.5, SOx, CO, and CO2e. The increase in NOx and VOC emissions is primarily due to the larger vessels assumed to call at the terminal during the peak day (8K, 12K, and 14K TEU) compared to the Final EIR (3K-5K, 5K-6K, and 8K-9K TEU). Several factors contribute to the decrease in emissions of the remaining pollutants compared to the Final EIR, including refinements in emission factors and transit speeds, lower sulfur content in fuel (0.1 percent compared to 0.2 percent in the Final EIR), and greater efficiency of larger vessels per TEU moved (which would affect annual CO2e emissions). In 2038, NOx emissions would also be less than the Final EIR, leaving VOC as the only pollutant with an emission increase. The transition of the 12K and 14K vessels to Tier 3 is the primary factor resulting in the NOx decrease in 2038.

Table 4. Operational OGV Emissions Associated with the Proposed Shoreside Crane Raise

Analysis Year	Equipment	Peak Daily Criteria Pollutant Emissions (lb/day)						Annual CO2e (MT/yr)
		PM10	PM2.5	NOx	SOx	CO	VOC	
2017	Vessel Transit	77.2	72.2	3,334.1	80.3	567.7	326.6	8,724
	Vessel Hoteling	24.8	23.3	766.9	78.7	71.1	28.4	11,715
	Total from Shoreside Crane Raise	102.0	95.5	4,101.0	158.9	638.9	355.0	20,439
	Total from Final EIR (OGV Transit and Hoteling)	109.0	102.0	3,581.0	1,429.0	667.0	109.0	60,286
	Emissions Impact Relative to Final EIR	-7.0	-6.5	520.0	-1,270.1	-28.1	246.0	-39,847
2018	Vessel Transit	77.2	72.2	3,334.1	80.3	567.7	326.6	8,858
	Vessel Hoteling	12.7	11.9	184.2	57.0	18.7	9.3	11,892
	Total from Shoreside Crane Raise	89.9	84.1	3,518.3	137.2	586.4	335.9	20,750
	Total from Final EIR (OGV Transit and Hoteling)	104.0	96.0	3,301.0	1,412.0	645.0	101.0	61,850
	Emissions Impact Relative to	-14.1	-11.9	217.3	-1,274.8	-58.6	234.9	-41,100

	Final EIR							
2019	Vessel Transit	77.2	72.2	3,334.1	80.3	567.7	326.6	8,992
	Vessel Hoteling	12.7	11.9	184.2	57.0	18.7	9.3	12,069
	Total from Shoreside Crane Raise	89.9	84.1	3,518.3	137.2	586.4	335.9	21,061
	Total from Final EIR (OGV Transit and Hoteling)	104.0	96.0	3,301.0	1,412.0	645.0	101.0	63,413
	Emissions Impact Relative to Final EIR	-14.1	-11.9	217.3	-1,274.8	-58.6	234.9	-42,353
2025	Vessel Transit	77.2	72.2	3,334.1	80.3	567.7	326.6	9,796
	Vessel Hoteling	12.7	11.9	184.2	57.0	18.7	9.3	13,130
	Total from Shoreside Crane Raise	89.9	84.1	3,518.3	137.2	586.4	335.9	22,926
	Total from Final EIR (OGV Transit and Hoteling)	104.0	96.0	3,301.0	1,412.0	645.0	101.0	72,795
	Emissions Impact Relative to Final EIR	-14.1	-11.9	217.3	-1,274.8	-58.6	234.9	-49,869
2038	Vessel Transit	77.2	72.2	807.6	80.3	567.7	326.6	9,796
	Vessel Hoteling	12.7	11.9	184.2	57.0	18.7	9.3	13,130
	Total from Shoreside Crane Raise	89.9	84.1	991.8	137.2	586.4	335.9	22,926
	Total from Final EIR (OGV Transit and Hoteling)	104.0	96.0	3,301.0	1,412.0	645.0	101.0	72,795
	Emissions Impact Relative to Final EIR	-14.1	-11.9	-2,309.2	-1,274.8	-58.6	234.9	-49,869

Notes:

1. The peak day emissions for the Shoreside Crane Raise assume 3 vessels simultaneously at berth (8K, 12K, and 14K TEU vessels) plus two one-way vessel transits to/from sea (12K and 14K TEU vessel transits). The 12K and 14K TEU vessels are assumed to use AMP in 2017, and all three vessels are assumed to use AMP 2018-2038. The following IMO marine engine tiers were assumed for the peak day, based on the POLA CEQA Terminal Level Container Ship Forecast for Tier 3 Engines (Aug 2015): the 8K TEU vessel would be Tier 1 2017-2019 and Tier 2 2025-2038; and the 12K and 14K TEU vessels would be Tier 2 2017-2025 and Tier 3 in 2038.
2. The annual emissions for the Shoreside Crane Raise assume the vessel fleet composition ranges from 3K to 14K TEU vessels.
3. The peak day emissions for the Final EIR assume 3 vessels simultaneously at berth (3K-5K, 5K-6K, and 8K-9K TEU vessels) plus two one-way vessel transits to/from sea (two 8K-9K TEU vessel transits). The 3K-5K and 8K-9K TEU vessels are assumed to use AMP in 2017, and all three vessels are assumed to use AMP 2018-2038. The Final EIR did not account for the penetration of IMO Tier 1-3 vessels into the fleet in future years.
4. The annual emissions for the Final EIR assume the vessel fleet composition ranges from <3K to 8K-9K TEU vessels.
5. The Shoreside Crane Raise emissions assume OGV fuel sulfur content is 0.1 percent in accordance with the California OGV Fuel Regulation. The Final EIR assumed a fuel sulfur content of 0.2 percent.
6. Emissions for both the Proposed Shoreside Crane Raise and the Final EIR are based on the throughput projections in the Final EIR.
7. Emissions assume compliance with the mitigation measures in the Final EIR.
8. Annual emissions for the Final EIR from 2017-2019 are interpolated from 2015 and 2025 values.
9. Because emissions from electricity consumption would be produced at regional power plants, far from the project site, only emissions of GHGs (which exhibit global impacts) were calculated for use of AMP during hoteling.
10. MT/yr = metric tons (1,000 kilograms) per year.

Air Quality Impacts of the Proposed Project Modifications

Table 5 indicates how the proposed project modifications would affect the impact analysis and findings in the 2007 Final EIR. Table 5 summarizes the changes in emissions associated with the proposed project modifications relative to the Final EIR (from Tables 3 and 4) and incorporates the emissions changes into the terminal-wide emissions impacts from the Final EIR (from Table 2) for analysis years 2016-2019, 2025, and 2038.

Table 5 shows that the peak daily criteria pollutant emissions impacts from the Final EIR would be less than significant in all analysis years, both before and after incorporating the impacts from the proposed project modifications. Moreover, the less-than-zero emissions impacts indicate that the emissions would be well below 2003 baseline levels for all criteria pollutants. Therefore, construction and operation of the proposed project modifications would not cause any new or substantially more severe significant criteria pollutant emission impacts than previously addressed in the Final EIR.

Table 5 also shows that the annual CO2e emissions impacts from the Final EIR would be significant in all analysis years, both before and after incorporating the impacts from the proposed project modifications. The electrification/modernization and rail improvements would increase terminal-wide CO2e emissions by 0.1 percent in 2016 (the raised shoreside cranes would not yet be operational in 2016). In all subsequent analysis years, starting in 2017, the proposed project modifications would decrease terminal-wide CO2e emissions, by 6.2 to 7.5 percent, depending on the year. The 1-year period of slightly increased CO2e emissions during construction, followed by the 22-year (and beyond) period of substantially decreased CO2e emissions, demonstrate that the accumulated CO2e emissions over the lifetime of the proposed project modifications would be greatly reduced compared to what was predicted in the Final EIR. Therefore, the proposed project modifications would not cause any substantially more severe significant GHG emission impacts than previously addressed in the Final EIR.

Table 5. Effect of the Proposed Project Modifications on the 2007 Final EIR Impacts

Analysis Year	Scenario	Peak Daily Criteria Pollutant Emissions (lb/day)						Annual CO2e (MT/yr)
		PM10	PM2.5	NOx	SOx	CO	VOC	
2016	Emissions Impact of Electrification/Modernization and Rail Relative to Final EIR [1]	3.7	1.1	12.6	0.1	45	2.3	370
	Original Terminal-Wide Emissions Impact from Final EIR [3]	-983.2	-1,022.0	-14,614.8	-2,402.2	-1,764	-1,076.3	277,272
	Revised Terminal-Wide Emissions Impact, Including Electrification/Modernization and Rail	-979.5	-1,020.9	-14,602.2	-2,402.1	-1,719	-1,074.0	277,642
	SCAQMD Thresholds	150	55	55	150	550	55	10,000

	Revised Terminal-Wide Emissions Significant?	No	No	No	No	No	No	Yes
	Percent Change in Terminal-Wide Emissions Due to Electrification/Modernization and Rail	0.6%	0.4%	0.2%	0.0%	0.9%	0.3%	0.1%
2017	Emissions Impact of Electrification/Modernization and Rail Relative to Final EIR [1]	4.3	2.0	28.4	0.5	228	8.4	3,207
	Emissions Impact of Crane Raise Relative to Final EIR [2]	-7.0	-6.5	520.0	-1,270.1	-28	246.0	-39,847
	Original Terminal-Wide Emissions Impact from Final EIR [3]	-975.4	-1,019.0	-14,564.6	-2,403.4	-1,653	-1,090.6	290,253
	Revised Terminal-Wide Emissions Impact, Including Electrification/Modernization/ Rail and Crane Raise	-978.0	-1,023.5	-14,016.2	-3,673.0	-1,453	-836.2	253,613
	SCAQMD Thresholds	150	55	55	150	550	55	10,000
	Revised Terminal-Wide Emissions Significant?	No	No	No	No	No	No	Yes
	Percent Change in Terminal-Wide Emissions Due to Electrification/Modernization/ Rail and Crane Raise	-0.4%	-1.5%	6.5%	-87.7%	3.8%	28.7%	-6.2%
2018	Emissions Impact of Electrification/Modernization and Rail Relative to Final EIR [1]	6.0	2.6	71.3	0.5	191	7.1	2,404
	Emissions Impact of Crane Raise Relative to Final EIR [2]	-14.1	-11.9	217.3	-1,274.8	-59	234.9	-41,100
	Original Terminal-Wide Emissions Impact from Final EIR [3]	-967.6	-1,016.0	-14,514.4	-2,404.6	-1,542	-1,104.9	303,234
	Revised Terminal-Wide Emissions Impact, Including Electrification/Modernization and Crane Raise	-975.7	-1,025.3	-14,225.8	-3,678.8	-1,409	-862.9	264,538
	SCAQMD Thresholds	150	55	55	150	550	55	10,000
	Revised Terminal-Wide Emissions Significant?	No	No	No	No	No	No	Yes

	Percent Change in Terminal-Wide Emissions Due to Electrification/Modernization/ Rail and Crane Raise	-1.3%	-3.0%	3.4%	-88.1%	2.5%	27.7%	-6.4%
2019	Emissions Impact of Electrification/Modernization and Rail Relative to Final EIR [1]	5.8	0.3	-7.4	-0.4	-225	-34.2	-615
	Emissions Impact of Crane Raise Relative to Final EIR [2]	-14.1	-11.9	217.3	-1,274.8	-59	234.9	-42,353
	Original Terminal-Wide Emissions Impact from Final EIR [3]	-959.8	-1,013.0	-14,464.2	-2,405.8	-1,431	-1,119.2	316,215
	Revised Terminal-Wide Emissions Impact, Including Electrification/Modernization/ Rail and Crane Raise	-968.1	-1,024.6	-14,254.3	-3,680.9	-1,715	-918.5	273,248
	SCAQMD Thresholds	150	55	55	150	550	55	10,000
	Revised Terminal-Wide Emissions Significant?	No	No	No	No	No	No	Yes
	Percent Change in Terminal-Wide Emissions Due to Electrification/Modernization/ Rail and Crane Raise	-1.3%	-3.7%	2.5%	-88.2%	-5.2%	23.4%	-6.9%
2025	Emissions Impact of Electrification/Modernization and Rail Relative to Final EIR [1]	-3.5	-3.3	-68.6	-0.8	-387	-19.5	-2,585
	Emissions Impact of Crane Raise Relative to Final EIR [2]	-14.1	-11.9	217.3	-1,274.8	-59	234.9	-49,869
	Original Terminal-Wide Emissions Impact from Final EIR [3]	-913.0	-995.0	-14,163.0	-2,413.0	-765	-1,205.0	394,102
	Revised Terminal-Wide Emissions Impact, Including Electrification/Modernization/ Rail and Crane Raise	-930.7	-1,010.2	-14,014.3	-3,688.6	-1,211	-989.5	341,648
	SCAQMD Thresholds	150	55	55	150	550	55	10,000
	Revised Terminal-Wide Emissions Significant?	No	No	No	No	No	No	Yes

	Percent Change in Terminal-Wide Emissions Due to Electrification/Modernization/ Rail and Crane Raise	-2.5%	-4.6%	1.7%	-88.7%	-7.2%	27.9%	-7.5%
2038	Emissions Impact of Electrification/Modernization and Rail Relative to Final EIR [1]	-3.5	-3.3	-68.6	-0.8	-387	-19.5	-2,585
	Emissions Impact of Crane Raise Relative to Final EIR [2]	-14.1	-11.9	-2,309.2	-1,274.8	-59	234.9	-49,869
	Original Terminal-Wide Emissions Impact from Final EIR [3]	-925.0	-1,007.0	-14,379.0	-2,413.0	-773	-1,216.0	394,372
	Revised Terminal-Wide Emissions Impact, Including Electrification/Modernization/ Rail and Crane Raise	-942.7	-1,022.2	-16,756.8	-3,688.6	-1,219	-1,000.5	341,918
	SCAQMD Thresholds	150	55	55	150	550	55	10,000
	Revised Terminal-Wide Emissions Significant?	No	No	No	No	No	No	Yes
	Percent Change in Terminal-Wide Emissions Due to Electrification/Modernization/ Rail and Crane Raise	-2.6%	-4.7%	-27.5%	-88.7%	-7.2%	28.3%	-7.5%

Notes:

1. From Table 3.
2. From Table 4.
3. From Table 2. Years 2016-2019 are interpolated from 2015 and 2025 values.
4. The emissions impact of the Proposed Backlands Electrification/Modernization and Rail Improvements Relative to the Final EIR is conservative in that it does not quantify the reduction in train delays from the railroad track improvements.
5. MT/yr = metric tons (1,000 kilograms) per year.
6. CO2e = carbon dioxide equivalent = (CO2 x 1) + (N2O x 298) + (CH4 x 25). Source: POLA 2014 EI, which used IPCC Fourth Assessment Report (AR4) Global Warming Potentials.

In terms of criteria pollutant ambient concentration impacts, the proposed project modifications would not result in modeled pollutant concentrations exceeding the results in the Final EIR. The modeling analysis in the Final EIR was performed for mitigated project emissions in year 2010, which was determined in the Final EIR to produce the highest off-site ambient pollutant impacts. As seen in Table 2, the Final EIR projected that the criteria pollutant emissions for the entire TraPac terminal would decrease substantially between the 2008 and 2015 milestone years. Therefore, the TraPac terminal emissions during the lifetime of the proposed project modifications (which would start construction in 2016) would be much less than those modeled in the Final EIR for 2010, even after accounting for the comparatively small emission increases for some pollutants from 2016 to 2025. Therefore, construction and

operation of the proposed project modifications would not cause any new or substantially more severe significant ambient criteria pollutant concentration impacts than previously addressed in the Final EIR.

In terms of human health risk impacts, the proposed project modifications would not result in predicted health risks exceeding the results in the Final EIR. The cancer risks in the Final EIR were based on annual emissions of PM10 from diesel internal combustion engines (DPM), averaged over the 70-year period 2007-2076. The proposed project modifications would impact emissions starting in 2016 through the lifetime of the projects. The accumulation of DPM emissions over the lifetime of the projects would be less than the Final EIR, as demonstrated by the reduction in PM10 emissions seen in Table 5 for every analysis year except 2016. The chronic and acute noncancer hazard indices in the Final EIR were based on mitigated project emissions of DPM (and also VOC for the acute hazard index) in year 2010, which was determined in the Final EIR to produce the highest results. As seen in Table 2, the Final EIR projected that PM10 and VOC emissions for the entire TraPac terminal would decrease substantially between the 2008 and 2015 milestone years. Therefore, the TraPac terminal emissions during the lifetime of the proposed project modifications (which would start construction in 2016) would be much less than those modeled in the Final EIR, even after accounting for the comparatively small emission increases for some pollutants during the construction period. Therefore, construction and operation of the proposed project modifications would not cause any new or substantially more severe significant human health risk impacts than previously addressed in the Final EIR.

While the quantitative air quality analysis in this Second EIR Addendum includes emissions from construction of the electrification/modernization and rail improvements, the potential reductions in emissions resulting from fewer train delays and improved efficiency in train loading/unloading operations were not quantified. For example, as discussed in Section V above, the two rail segment improvements could reduce delays by approximately 37 train-hours/day (combined idling and moving) by 2035. The corresponding reduction in train emissions would further improve the air quality impacts of the electrification/modernization improvements that were quantified in this section.

Although the quantitative air quality analysis in this Second EIR Addendum focuses on the impacts of the proposed project modifications relative to the Final EIR, the combined impacts of the First and Second EIR Addendum are considered here. As discussed previously, the First Addendum involved the replacement of existing diesel CHE with electric RMG cranes and diesel electric shuttles. It found that overall emissions would be significantly lower than what was predicted in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. As a result, the combined impacts of the First and Second EIR Addendum would be lower than those of the First EIR Addendum alone. Therefore, the proposed project modifications addressed in the First and Second EIR Addendum would not cause any new or substantially more severe significant air quality or human health risk impacts than previously addressed in the Final EIR.

9.3 BIOLOGICAL RESOURCES

Final EIR and First EIR Addendum Conclusions

Impacts to biological resources were discussed in Chapter 3.3 of the Final EIR, which concluded that no critical habitat for any listed species exists within the Project site. There would be no impacts to Significant Ecological Areas (SEAs), kelp beds, eelgrass beds or wetlands because none of these habitats are present at or near the Project site. No known terrestrial wildlife or aquatic species migration corridors are present in the Project area, and implementation of the original Project would not interfere with the aerial migration or movement of the California least tern, western snowy plover, California brown pelican or other water-related bird species. The Final EIR determined that runoff of sediment and pollutants from construction and operation activities would not substantially disrupt biological communities in the West Basin and would only have localized, less than significant impacts on marine organisms in the immediate vicinity of drain outlets due to the implementation of runoff control measures that are a part of the original Project (e.g., site-specific stormwater pollution prevention plan and best management practices such as sediment barriers and sedimentation basins). Water quality standards for protection of marine life would not be exceeded (see Section 3.13 of the Final EIR). Increased vessel traffic would increase the potential for introducing invasive species that could have significant and unavoidable impacts on biological communities. All other impacts of the original Project on biological resources were determined to be less than significant.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to biological resources because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

The Final EIR determined that no critical habitat for any listed species exists within or near the Project site. It concluded that the backlands of the terminal, where the proposed Project modifications would occur, are not used by sensitive species for resting, foraging (except potentially by the peregrine falcon), or breeding, and thus none of these species would be present to be affected by proposed modification construction activities. The proposed Project modifications do not involve any in- or over-water work and thus would not impact in-water biological resources including Essential Fish Habitat. No Significant Ecological Areas would be affected by the proposed Project modifications because none are present near the Project site. There are also no known terrestrial wildlife or aquatic species migration corridors present in the proposed Project area and construction activities in the West Basin and on the adjacent lands

would not block or interfere with migration or movement of any migratory bird species because the work would be in areas where the birds could easily fly around or over the work. Accidents on land could result in runoff of pollutants, but levels that could adversely affect aquatic biota near the point of discharge to the Harbor are unlikely due to containment, rapid cleanup, and implementation of runoff control measures. As such, the proposed Project modifications, which involve improvements within the backlands of the terminal, along the wharf where existing shoreside cranes are located, and at existing rail road crossings, would not cause any new or substantially more severe impacts to protected species or designated natural habitats during construction beyond those previously disclosed in the Final EIR.

The Final EIR determined that operation of new and upgraded terminal facilities in the West Basin would not adversely affect any state- or federally-listed, or special concern bird species. The species that currently use the West Basin area for foraging or resting could continue to do so as the proposed Project modifications would not appreciably change the industrial activities in the West Basin or cause a loss of habitat for those species. Operation of the backland facilities (e.g., cranes, railyard, and container transfers) would not measurably change the numbers or species of common birds in that area and, thus, would not affect peregrine falcon foraging. Perching locations for birds such as the California brown pelican would still be present. The proposed Project modifications are contained completely within the backlands of the existing terminal, along the wharf where existing shoreside cranes are located, or immediately adjacent to existing rail tracks and the operations are consistent with the industrial activities of the West Basin. As such, the proposed Project modifications would not cause any new or substantially more severe impacts to biological resources compared to what was disclosed in the Final EIR.

The proposed Project modifications would not cause an increase in vessel calls above that analyzed in the Final EIR, and therefore would not contribute additional impacts to noise or the potential to introduce non-native species through the discharge of ballast water or biofouling of vessel hulls. Similarly, there would be no additional impacts from vessel-related disturbance, turbidity or discharge. There are no SEAs or natural plant communities present within the Project site that could be affected by operation of the proposed Project modifications. Operation of the proposed Project modifications within the backland facilities, along the wharf where existing shoreside cranes are located, and the railyard would not interfere with any terrestrial migration corridors as none are present in those areas. Migration by bird species that visit or pass through the proposed Project area would not be affected by the changes in terminal operations because the new structures would not impede their movement. Runoff of pollutants to the Harbor from operations of the new facilities would have negligible effects on marine biological communities (fish, benthos, plankton), as existing runoff and storm drain discharge controls as well as conditions of all proposed site-specific permits would be implemented. For the reasons described above, operation of the proposed Project modifications would not cause any new or substantially more severe significant impacts to biological resources beyond those disclosed in the Final EIR.

9.4 CULTURAL RESOURCES

Final EIR and First EIR Addendum Conclusions

The Final EIR determined that no known archaeological sites are recorded within the Project area, and no evidence of prehistoric or historic archaeological material was identified during previous cultural resource site record and literature searches and archaeological surveys. Due to the extensive nature of previous ground disturbances within the Project area and the substantial depths to which the soils have been disturbed, it is highly unlikely that any unknown, intact archaeological deposits exist within soils in the proposed Project area. Although the potential for discovering unknown archaeological resources is remote, mitigation measure CR-1 would be adhered to during construction of the proposed Project modifications which would mitigate impacts to any previously unknown archaeological resources that may be encountered.

The Final EIR determined that there are no historic architectural resources eligible for listing in the NRHP, the CRHR, or otherwise considered a unique or important architectural historic resource present within the Berths 136-147 Terminal area. All of the existing buildings onsite are no greater than 30 years old, and there are no other structures present which possess unique or significant architectural value. The northwestern portion of the Harry Bridges Buffer Area between Harry Bridges Boulevard and "C" Street contains Late Pleistocene sandstone and sand deposits which could potentially contain intact vertebrate fossils of regional significance. Mitigation measure CR-2 would be adhered to during construction to mitigate impacts to any previously unknown paleontological resources that may be encountered. No other areas within the Project site were identified as having the potential to contain paleontological resources.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to cultural resources because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

All existing buildings and structures within Berths 136-147 were evaluated in a Historic Architectural Survey in November 2013, including the crane maintenance building that would be demolished as part of the proposed Project modifications. The Final EIR concluded that the crane maintenance building, which is 29 years old, is not eligible for listing in the NRHP or the CRHR, and is also not eligible for local designation as a city of Los Angeles HCM. All other

components of the proposed Project modifications would not affect any buildings or structures, as the proposed sites consist of pavement, open ground and/or existing rail track. Therefore, there would be no additional impacts to architectural resources beyond that disclosed in the Final EIR.

There are no known archeological sites within the original Project area, as well as no evidence of historic archeological material being identified during previous cultural resource site record and literature searches. The only area identified in the Final EIR as having the potential to contain paleontological resources is the Harry Bridges Buffer Area between Harry Bridges Boulevard and "C" Street. Excavation and ground disturbance associated with the proposed Project modifications would be limited to the terminal and rail lines and would not occur in this area. The only proposed modification not contained within the footprint of the original Project is the rail improvement adjacent to the Dominguez Channel. This improvement consists of re-aligning existing track and constructing new track directly adjacent to the existing track. Given the site's history of extensive ground disturbance and industrial land use, it is reasonable to assume that the potential of discovering significant unknown archeological or paleontological deposits would be remote. In the unlikely event that such resources are encountered during construction, adherence to mitigation measure CR-1 and CR-2 would ensure that impacts remain less than significant. For the reasons described above, the proposed Project modifications would not cause any new or substantially more severe significant impacts to cultural resources beyond those disclosed in the Final EIR.

9.5 GEOLOGY

Final EIR and First EIR Addendum Conclusions

The Final EIR assessed geologic conditions for the original Project in the following areas: (1) seismic hazards including surface rupture, ground shaking, liquefaction, subsidence, tsunamis, and seiches; (2) other geologic issues including potentially unstable soils and slopes; and (3) mineral resources. The evaluation was based on published reports and the general geologic setting as indicators of potential geologic hazards. The Final EIR found that the Project would be exposed to significant and unavoidable seismic- , tsunami- and seiche-related impacts as a result of numerous active faults in southern California, as well as the relatively low elevation of Port berths and backland areas. All other impacts of the original Project were determined to be less than significant. In order to mitigate the risk of coastal flooding due to tsunamis and seiches, mitigation measure GEO-1 during construction would be adhered to in order to reduce injuries to on-site personnel during a tsunami. However, impacts during the construction phase would remain significant and unavoidable.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to geology because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated

in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

As in the Final EIR, the proposed Project modifications would be built in compliance with the Los Angeles Building Code. All improvements would be designed in accordance with Los Angeles Building Code, Sections 91.000 through 91.7016 of the Los Angeles Municipal Code, to minimize impacts associated with seismically induced geohazards. Sections 91.000 through 91.7016 of the Los Angeles Municipal Code regulate construction in backland areas of the Port. These building codes and criteria provide requirements for construction, grading, excavations, use of fill, and foundation work, including type of materials, design, procedures, etc. These codes are intended to limit the probability of occurrence and the severity of consequences from geological hazards. Necessary permits, plan checks, and inspections are also specified. The Los Angeles Municipal Code also incorporates structural seismic requirements of the California Uniform Building Code, which classifies almost all of coastal California (including the Project site) within Seismic Zone 4, on a scale of 1 to 4, with 4 being most severe. The Project engineers would review the Project plans for compliance with the appropriate standards in the building codes.

Construction and operation of the proposed Project modifications would cause a minor increase in the exposure of people and property to seismic hazards because the proposed Project area lies in the vicinity of the Palos Verdes Fault Zone. Strands of the fault may pass beneath the perimeter and immediately west of the proposed Project area, in the vicinity of Berths 131/132 and 147, which is outside of but near the area of the proposed Project modifications (Berths 136-139). Strong-to-intense ground shaking, surface rupture, and liquefaction could occur in these areas, due to the location of the fault beneath the proposed Project area and the presence of water-saturated hydraulic fill. With the exception of ground rupture, similar seismic impacts could occur due to earthquakes on other regional faults. Earthquake-related hazards, such as liquefaction, ground rupture, ground acceleration, and ground shaking cannot be avoided in the Los Angeles region and in particular in the harbor area where the Palos Verdes Fault is present and hydraulic and alluvial fill is pervasive. Even with adherence to all required building codes, impacts due to seismic ground movement would be significant and unavoidable. No mitigation was or is available to lessen the impact. Construction and operation of the proposed Project modifications would not create any new or substantially more severe significant seismic hazards beyond those disclosed in the Final EIR.

The Final EIR found that the TraPac project would be exposed to significant and unavoidable tsunami- or seiche-related hazards. Although relatively rare, should a large tsunami or seiche occur, it would be expected to cause some amount of damage and possibly injuries to most on or near shore locations. The proposed Project modifications would cause a minor increase in exposure of people and property to these hazards. Construction and operation of the proposed

Project modifications would not create any new or substantially more severely significant tsunami- or seiche-related hazards beyond those disclosed in the Final EIR. Mitigation Measure GEO-1 would be adhered to during construction of the proposed Project modifications.

The Final EIR concluded that TraPac project settlement impacts would be less than significant, as the Project would be designed and constructed in compliance with building code requirements and would not result in substantial damage to structures or infrastructure, or expose people to substantial risk of injury. Those considerations also apply to construction of the proposed Project modifications. Therefore, construction and operation of the proposed Project modifications would not create new significant impacts related to soil settlement beyond the impacts disclosed in the Final EIR.

The Final EIR concluded that the TraPac project would not expose people or property to significant risks due to soil expansion. Expansive soil may be present in the vicinity of the Berths 136-147 area and may be present in dredged or imported soils used for proposed Project grading. Expansive soils beneath the proposed Project's foundations could result in cracking and distress of foundations. Existing structures built on these sediments could be cracked and warped by such settlement. However, as with the TraPac project described in the Final EIR, during the proposed Project modifications design phase, the engineer would evaluate the expansion potential associated with on-site soils. The soil expansion potential would be evaluated through a site-specific geotechnical investigation, which includes subsurface soil sampling, laboratory analysis of samples collected to determine soil expansion potential, and an evaluation of the laboratory testing results, by a geotechnical engineer. Recommendations of the engineer would be incorporated into the design specifications for the proposed Project modifications, consistent with City design guidelines, including Sections 91.000 through 91.7016 of the Los Angeles Municipal Code, in conjunction with criteria established by LAHD. Therefore, construction and operation of the proposed Project modifications would not create new significant impacts related to soil settlement beyond the impacts disclosed in the Final EIR.

The Final EIR concluded that the TraPac project would not expose people or property to significant risks due to landslides or mudslides. The topography in the vicinity of the TraPac project site and the sites of the proposed Project modifications is flat and not subject to landslides or mudslides, with no prominent geologic or topographic features that could be destroyed. Therefore, construction and operation of the proposed Project modifications would not create new significant impacts related to landslides or mudslides, or to prominent geologic or topographic features, beyond the impacts disclosed in the Final EIR.

The Final EIR concluded that the TraPac project would not result in the permanent loss of availability of any mineral resource of regional, statewide, or local significance. The TraPac project site is located in zone MRZ-1, which is defined as an area where adequate information indicates that no significant mineral deposits are present or where it is judged that little likelihood exists for their presence. However, with respect to petroleum resources, the northern portion of the TraPac project site is located within the Wilmington Oil Field. As with

the TraPac project analyzed in the Final EIR, construction of the proposed Project modifications would preclude oil and gas drilling from within the boundaries of the improvements; however, petroleum reserves beneath the site could be accessed from remote locations, using directional (or slant) drilling techniques. Therefore, construction and operation of the proposed Project modifications would not create new significant impacts related to the permanent loss of availability of a known mineral resource of regional, statewide, or local significance beyond the impacts disclosed in the Final EIR.

Based on the above analysis, the proposed Project modifications would not cause any new or substantially more severe significant impacts related to geologic resources beyond those disclosed in the Final EIR.

9.6 GROUNDWATER AND SOILS

Final EIR and First EIR Addendum Conclusions

The Final EIR concluded that impacts to groundwater and soils would be significant, but less than significant with mitigation on-site contamination during construction would be reduced to levels acceptable by the applicable lead regulatory agency. Mitigation Measure GW-1 would require soil and groundwater remediation of known contaminated areas. Mitigation Measure GW-2 would require implementation of a contingency plan for encountering unknown soil contamination. These measures would reduce the risk of health and safety impacts to on-site personnel in backland areas, as well as construction personnel and recreational users of the buffer area, in the event that construction activities encounter toxic substances or other contaminants associated with historical uses of the Port to less than significant levels. In addition, no excavations that might encounter contaminated soil and/or groundwater would be completed as part of Project operations. Although shallow groundwater may be locally extracted during construction dewatering operations (e.g., for utility line and foundation excavations), this perched groundwater is highly saline and non-potable and drinking water is provided to the area by the City of Los Angeles Department of Water and Power. No existing production wells are located in the vicinity of the Project site. Construction activities at the Project site would result in removal of pavement in select areas prior to repaving, thus resulting in a temporary increase in groundwater recharge at the site, which was determined to be inconsequential.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to groundwater and soils because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact

analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

Construction of the proposed Project modifications would adhere to the construction-related mitigation measures outlined in the Final EIR (MM GW-1 and GW-2) to reduce on-site contamination to levels acceptable by the applicable lead regulatory agency. The proposed Project modifications would not include any operations that would encounter contaminated soil and/or groundwater or require dewatering operations. Therefore, the proposed Project modifications would not cause any new or substantially more severe significant impacts to groundwater and soils beyond those disclosed in the Final EIR.

9.7 HAZARDS AND HAZARDOUS MATERIALS

Final EIR and First EIR Addendum Conclusions

The Final EIR analyzed the potential impacts of hazards and hazardous materials related to releases of hazardous materials to the environment, and impacts on public health and safety from fires, explosions, and releases of hazardous materials associated with construction and operation of the Project. The Final EIR concluded the Project would be exposed to significant and unavoidable tsunami-related impacts as a result of possible submarine landslides and numerous active faults in offshore southern California waters, as well as the relatively low elevation of Port berths and backland areas as disclosed under Geology. However, impacts related to hazards and hazardous materials were found to be less than significant and no mitigation was required.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to hazards and hazardous materials because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

Consistent with the original Project, the proposed Project modifications would result in less-than-minor impacts to hazards and hazardous materials. The proposed Project modifications are minor in scale compared to the overall Project, and would not change terminal or rail operations in a manner that would impact public health and safety from fires, explosions, and

releases of hazardous materials. The terminal would continue to operate as a container terminal, the number of existing shoreside cranes would not change, and the proposed rail improvements would reduce rail congestion. Project operations would be subject to current emergency response and evacuation systems implemented by the Los Angeles Fire Department and Police Department. Therefore, the proposed Project modifications would not cause any new significant impacts related to hazards and hazardous materials beyond the impacts disclosed in the Final EIR.

9.8 LAND USE

Final EIR and First EIR Addendum Conclusions

The Final EIR found the Project would be consistent with the Port of Los Angeles Plan, Port Master Plan, Wilmington Harbor City Community Plan, and site zoning (after amendments) and included a buffer element that would serve as a physical separation between the terminal facilities and residential areas. Proposed roadway improvements associated with widening Harry Bridges Boulevard and the buffer area would not conflict with adopted policies and plans. Furthermore, the Final EIR found the Project would not result in significant secondary impacts on land use that would change residential property trends in the areas immediately adjacent to the Port. Overall, impacts on land use were found to be less than significant and no mitigation was required. However, truck use within Wilmington was addressed in the analysis of land use impacts because of TraPac's unique proximity to Wilmington, in response to comments raised on this issue during the EIR. Mitigation measures LU-1 and LU-2 were added to discourage trucks from leaving the designated truck routes that border the Port and directly entering the community by requiring truck route signage and truck traffic enforcement. Truck route signage was posted in Wilmington and San Pedro to restrict Heavy Duty Class 7 and Class 8 trucks from driving down streets along with "No Idling" at various locations throughout the Port and the surrounding neighborhoods of San Pedro and Wilmington, including parks and schools.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to land use because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

Consistent with the original Project, the proposed Project modifications would result in minor impacts to land use. The proposed Project modifications are minor in scale compared to the overall Project, and would not require any changes in land use or zoning. Most of the

improvements would be located within the existing terminal which is heavily industrialized and the proposed rail improvements would be adjacent to existing rail trackage that is already in operation. In addition, mitigation measures LU-1 and LU-2 have already been implemented. As such, the proposed Project modifications would not cause any new or substantially more severe significant impacts related to land use beyond those disclosed in the Final EIR.

9.9 NOISE

Final EIR and First EIR Addendum Conclusions

The Final EIR concluded there would be no construction-related noise impacts during prohibited hours which are between the hours of 9:00 pm and 7:00 am Monday through Friday, before 8:00 am or after 6:00 pm on Saturday, or at any time on Sunday. However, construction activities would temporarily and periodically generate noise levels that would exceed existing ambient daytime noise levels at sensitive receivers near the new relocated Pacific Harbor Line (PHL) switching rail yard at Berth 200 and along "C" Street during construction of the Buffer Area. Mitigation measure NOI-1 would reduce potential impacts to these receivers during construction through limits on construction hours and days, temporary noise barriers, construction equipment controls, and notification and reporting. However, impacts were found to remain significant and unavoidable at the buffer area and relocated PHL rail yard.

Operational noise levels would not cause the CNEL to be increased by 3 dBA CNEL or more to the "normally unacceptable" or "clearly unacceptable" category, nor exceed 5 dBA over the current CNEL at sensitive locations. Therefore, operational noise impacts would be less than significant. Although impacts from operational noise were not found to be significant, mitigation measure NOI-2 would further reduce noise from the relocated Pacific Harbor Line (PHL) switching rail yard and would provide additional landscaping in the Port. Mitigation measure NOI-2 provides that a landscaped buffer along the northwest side of the relocated PHL switching rail yard at Berth 200 between the yard and Alameda Street and on the southeast side of the yard between the facility and the marina area, will be incorporated into the project scope. The buffer will include mature trees and shrubs and shall be maintained for the life of the Project. If noise monitoring indicates that there will be exceedance of the City noise ordinance at the marinas in consolidated slip from operation of the relocated PHL switching rail yard, a 6'-8' wall along the southeast side of the yard between the yard and the marinas will be constructed.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to noise because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum

did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

Consistent with the original Project, the proposed Project modifications would limit construction to daytime hours in accordance with Los Angeles Municipal Code requirements. The proposed Project modifications are minor in scale compared to the overall Project and would be limited in duration. Most of the improvements would be located within the terminal which is heavy industrial and the proposed rail improvements would be adjacent to existing rail trackage that is already in operation. Although the proposed Project modifications would result in new construction during 2016-2019 which would overlap with some construction that is currently being completed as part of the overall TraPac development project, the buffer has already been constructed and provides a physical barrier between the terminal and residential areas such that noise from terminal operations combined with the new construction is likely to be lower than what the Final EIR and First Addendum projected.

Operational noise would not increase from what was analyzed in the Final EIR and may further decrease with greater use of electrified equipment rather than diesel equipment as analyzed in the First Addendum. Furthermore, Mitigation Measure NOI-2 has already been implemented to provide a landscaped buffer along the northwest side of the relocated PHL switching rail yard at Berth 200 and noise monitoring has been completed which confirmed that there was no exceedance of the City's noise ordinance at the marinas in the consolidated slip from operation of the relocated PHL switching rail yard. Given that the proposed Project modifications include additional use of electrified equipment beyond what was considered in the First Addendum, long-term operational noise would decrease at the terminal. Reduced train delays from the railroad track improvements would also translate into reduced operational noise from less train idling. There would be no change to the existing number of shoreside cranes in operation. As such, the proposed Project modifications would not cause any new or substantially more severe significant impacts to noise beyond those disclosed in the Final EIR and First Addendum.

9.10 TRANSPORTATION/ CIRCULATION

Final EIR and First EIR Addendum Conclusions

The Final EIR found there would be temporary impacts on the study area roadway system during construction of the Project because the construction activities would generate vehicular traffic associated with construction workers' vehicles and trucks delivering equipment and fill material to the site. Incorporation of Mitigation Measure TRANS-1 requires the construction contractor to prepare a detailed traffic management plan. This plan will ensure that impacts to the study area roadway system as a result of Project construction will be less than significant.

The Project would result in significant circulation system impacts at four study intersections as follows:

- The level of service (LOS) at the Avalon Boulevard/Harry Bridges Boulevard intersection would experience a significant traffic impact during the P.M. peak hour during proposed Project build-out year 2038. At 2038, Avalon Boulevard/Harry Bridges Boulevard would operate at LOS C during the P.M. peak hour, and the level of Project-related traffic would exceed the City of Los Angeles threshold for significant impact.

- The Alameda Street/Anaheim Street intersection would experience a significant traffic impact during the A.M. peak hour during proposed Project build-out year 2015 and significant traffic impact for both the A.M. and P.M. peak hours in 2038. At 2015, Alameda Street/Anaheim Street would operate at LOS D during the A.M. peak hour, and the level of Project-related traffic would exceed the City of Los Angeles threshold for significant impact. At 2038, Alameda Street/Anaheim Street would operate at LOS F in the A.M. peak hour and LOS E during the P.M. peak hour, and the level of Project-related traffic would exceed the City of Los Angeles threshold for significant impacts.

- The Fries Avenue/Harry Bridges Boulevard intersection would experience a significant traffic impact during the P.M. peak hour during proposed Project build-out year 2038. At 2038, Fries Avenue/Harry Bridges Boulevard would operate at LOS C during the P.M. peak hour; and the level of Project-related traffic would exceed the City of Los Angeles threshold for significant impacts.

- The Broad Avenue/Harry Bridges Boulevard intersection would experience a significant traffic impact during the P.M. peak hour during proposed Project build-out year 2038. At 2038, Broad Avenue/Harry Bridges Boulevard would operate at LOS C during the P.M. peak hour; and the level of Project-related traffic would exceed the City of Los Angeles threshold for significant impacts.

Mitigation measures TRANS-2 through TRANS-5 were incorporated into the project to avoid or substantially lessen the significant environmental effects identified in the Final EIR at these intersections. In addition, improvements to freeway ramp/arterial interchanges along SR-47 and I-110 were added as mitigation measures TRANS-6 and TRANS-7. Implementation of these six mitigation measures (TRANS-2 through TRANS-7) were found to reduce circulation system impacts at the four study intersections identified above to less than significant levels.

Project operations were found to cause an increase in rail activity, resulting in delays in regional traffic. The amount of delay is related to the length of the train, the speed of the train and the amount of auto and truck traffic that is blocked. The Project would cause an increase in either the number of trains or the amount of auto and truck traffic; however, the increase in auto and truck traffic would only affect some of the at-grade crossings. In this case, the affected at-grade crossings are at Avalon Boulevard and Henry Ford Avenue. Although Project operations alone

would not result in an additional train during the peak hour on a regular basis, it is possible that the cumulative development of the West Basin (Berths 97-109, Berths 121-131, Berths 136-147) may together result in an added train during the peak hour. Therefore, the Final EIR found there would be a significant, unavoidable transportation/circulation impact at the Henry Ford Avenue and Avalon Boulevard grade crossings as a result of the Project. No mitigation is available to reduce this impact.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to transportation/circulation because cleaner zero and near-zero emissions equipment to replace diesel equipment, along with the associated infrastructure, would be built and operated in the same location and manner as previously analyzed in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

The proposed Project modifications include new construction during 2016-2018 which would overlap with some construction that is currently being completed as part of the overall TraPac development project. In order to ensure that impacts to the study area roadway system during construction of the proposed Project modifications will be minimized, implementation of Mitigation Measure TRANS-1 requires the construction contractor to prepare a detailed traffic management plan. Once fully operational in 2019, after modernization of the final 25 acres of backlands, raised shoreside cranes, and associated rail improvements, the TraPac terminal would operate in an efficient manner to meet future cargo demand as projected in the EIR and would not affect terminal TEU throughput or capacity.

In addition, some of the transportation mitigation measures have been or will be completed to respond to the anticipated growth, and would further reduce the proposed Project modifications' construction traffic impacts. Specifically, mitigation measure TRANS-3 which calls for improvements to Alameda Street and Anaheim Street by 2015 will be completed in 2018. (For additional information on the level of service analysis that was done to address the delayed implementation of this mitigation measure, refer to Appendix B of this Second EIR Addendum.) Mitigation measures TRANS-6 and TRANS-7 that call for improvements to freeway ramp/arterial interchanges along State Route-47/Interestate-110 at John S. Gibson Blvd and C Street/Figueroa Street are scheduled for completion in 2016. The Harry Bridges Boulevard realignment and Wilmington Grade Separation have already been completed. The remaining transportation mitigation measures (TRANS-2, -4, and -5) are not required until prior to 2038 when the TraPac terminal is at full capacity. As such, the proposed Project modifications would not result in any new or substantially more severe impacts to transportation/circulation, and no mitigation is required beyond what was previously disclosed in the Final EIR.

Additionally, the proposed rail segment improvements would improve the efficiency of the rail network and reduce train delays. The rail simulation completed for this Second Addendum found the rail road track extension between the TraPac lead track and San Pedro main line track would reduce train delays (moving and idling, in aggregate) by approximately 36 hours/day, from 120 total hours of delay without the improvement to 84 total hours of delay with the improvement. Similarly, the second rail track along the Dominguez Channel between Anaheim Street and Henry Ford Avenue would reduce train delays (moving and idling, in aggregate) by approximately one hour/day. Although these reductions in delay would occur at the specified locations, they would generally reduce bottlenecks in the system and would not cause any new or substantially more severe significant impacts to rail beyond those disclosed in the Final EIR.

9.11 MARINE TRANSPORTATION

Final EIR and First EIR Addendum Conclusions

The Final EIR determined that construction activities associated with the original Project could create in-water hazards to vessel traffic and increase the potential for accidents through the use of in-water construction equipment and barges. However, these activities are routinely conducted in the Port and all construction activities would be subject to applicable safety precautions and regulations stipulated in LAHD contracts and Department of the Army permits. The Final EIR determined that the Project would result in an increase of 88 calls per year, which would not substantially increase vessel congestion within the Port and precautionary areas. Additionally, the Project would have long-term beneficial impacts on marine transportation as berths would be deepened and existing wharf infrastructure would be upgraded to accommodate modern container ships. The utilization of standard safety precautions by the Port when piloting vessels through harbor waters would ensure that both the short-term presence of construction barges and long-term operation of container vessels would not reduce the existing level of safety for vessel navigation. For these reasons, impacts to marine transportation would be less than significant. Accordingly, no mitigation measures were required.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to marine transportation because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

The proposed Project modifications are all additional landside improvements and modifications to existing shoreside cranes that do not have the potential to interfere with designated vessel traffic lanes or impair the safety of navigating vessels. Demolition of the existing crane maintenance building and construction of the replacement building would not affect marine transportation in any way. The repaving of the 12-acre area and installation of the ASC modules would not occur over the water in a manner that could affect vessel navigation. Raising three existing shoreside cranes in height and extending the backreach would also not interfere with vessel navigation and would improve clearance and loading requirements for larger vessels expected to call at the terminal. The two additional rail improvements are infrastructure upgrades that affect land transportation only. None of these proposed Project modifications would require the use of in-water construction equipment or barges except for the use of a temporary crane barge to modify the boom on the crane. Once fully operational in 2019, after the proposed Project modifications, the TraPac terminal would operate in an efficient manner to meet future cargo demand as projected in the EIR consistent with the terminal TEU throughput and vessel calls as analyzed in the Final EIR. Therefore, implementation of the proposed Project modifications would not cause any new significant impacts to marine transportation beyond those disclosed in the Final EIR.

9.12 UTILITIES AND PUBLIC SERVICES

Final EIR and First EIR Addendum Conclusions

Impacts to public services, utilities and recreation were analyzed in the Final EIR, which determined that the Port has adequate fire, police and public maintenance services available to serve the original Project, and that the Project would not require the expansion or creation of additional law enforcement or fire station facilities. Project construction and operation would not result in a loss or diminished quality of recreational resources, as the West Basin is fully developed with industrial uses and is generally not used for recreational purposes. The existing Class II bike lane located adjacent to John S. Gibson Boulevard and Pacific Avenue will remain accessible during construction and operation of the original Project, and in-water construction activities would not interfere with vessel traffic lanes in the Main Channel in a manner which would preclude private watercraft recreational opportunities in the Project vicinity. Therefore, impacts to public services and recreation were determined to be less than significant in the Final EIR.

The original Project would not result in a substantial increase in utility demands; however, construction or expansion of onsite water or wastewater lines would potentially be required to support new terminal development. As part of the Project, the Port would prepare a Public Services Relocation Plan which would be reviewed by service providers and City departments prior to implementation. As new utility lines would be located within existing City streets/existing pipeline corridor easements, would comply with the City's municipal code, and

would be performed under permit by the City Bureau of Engineering and/or Los Angeles Department of Water and Power (LADWP), expansion of utility lines would not result in significant impacts. The Final EIR also determined that the Project would not generate substantial solid waste, water and/or wastewater demands that would exceed the capacity of existing facilities. However, construction and demolition activities would generate debris that would require disposal in a landfill. Since this solid waste is not quantifiable and construction debris is one of the greatest individual contributors to solid waste capacity, impacts associated with solid waste generation during construction activities would be significant under CEQA. Mitigation measures PS-1 through PS-3 requiring recycling of construction materials, use of construction materials with recycled content, and compliance with the California Solid Waste Management Act (Assembly Bill 939) to achieve a 50 percent reduction in waste generation would reduce solid waste impacts to less than significant.

Additionally, the Final EIR determined that although implementation of the Project would generate minor increases in energy demands, construction of new offsite energy supply facilities and distribution infrastructure would not be required to support Project activities. Energy demands during construction activities would be short-term and temporary. The Project would provide new energy distribution infrastructure required to support Project operations, and Berths 136-147 Terminal operations would not exceed existing supplies and/or result in the need for major new facilities. Impacts to energy supply infrastructure would therefore be less than significant.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to utilities and public services because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

As disclosed in the Final EIR, the TraPac project would have less than significant impacts on public services and recreation. The proposed Project modifications would have minor impacts on public services and recreation, and therefore would not cause new significant impacts on public services and recreation beyond the impacts disclosed in the Final EIR. The proposed Project modifications are minor in scale compared to the overall TraPac project, and would not affect terminal operations in a manner that would contribute to additional cumulative demand for emergency services. Project operations would not affect emergency response times as the site would have the same land use, no existing fire lanes or hydrants would be removed, and site access would be reviewed by the LAFD. The relocation of the crane maintenance building, repaving, installation of ASC runs, raised shoreside cranes, and rail improvements would not change terminal operations in a way that would burden existing police or fire facilities beyond

that previously disclosed in the Final EIR. Additionally, the proposed Project modifications would not overlap with the Class II bike lane located adjacent to John S. Gibson Boulevard and Pacific Avenue, and do not involve any in-water construction activities that could interfere with private watercraft recreational opportunities.

Implementation of the proposed Project modifications would cause new onsite utility lines for water and wastewater to be constructed, and the relocation and/or extension of some existing utility lines could also occur. All infrastructure improvements and connections would occur within City streets, would comply with the City's municipal code, and would be performed under permit by the City's BOE and/or LADWP. Additionally, the LAHD would prepare a Public Service Relocation Plan in coordination with service providers to assist in utility improvements; advanced notification and coordination between LAHD, the City, and utility providers would ensure that service providers and City departments have input into proposed infrastructure relocation and replacement prior to construction.

The proposed Project modifications would generate minimal increased demands for water consumption associated with onsite usage (restrooms and sinks in the crane building) and site maintenance (washing). The current crane building would be demolished and replaced with a building similar in footprint and purpose, and none of the modifications include major water-consuming industrial or commercial processes. Therefore, implementation of the proposed Project modifications would not require substantial quantities of water. Increased staff levels associated with construction would generate a minor increase in wastewater flows; however, this negligible increase would be temporary and would not exceed the capacity of the Terminal Island Water Treatment Plant or conveyance system. There would be no increase in impervious surfaces, as the terminal sites for which modifications are proposed are already fully paved, and the two rail improvements would also not create any additional areas of impervious surface. Thus there would be no impacts to the storm drain system beyond those previously addressed in the Final EIR. The preparation of a Public Services Relocation Plan and subsequent review by service providers and City departments would ensure that new significant impacts to public utilities beyond the impacts described in the Final EIR would not occur.

For solid waste, construction of the proposed Project modifications would generate construction and demolition debris requiring disposal in a landfill. This volume of construction waste is not quantifiable but would be small relative to the total volume of construction waste disclosed in the Final EIR. Adherence to mitigation measures PS-1, PS-2 and PS-3 would reduce these impacts. Therefore the proposed Project modifications would not cause new or substantially more severe significant solid waste impacts beyond those disclosed in the Final EIR.

The proposed Project modifications would not affect overall container terminal operations, which primarily consist of container loading and storage activities that would not generate substantial amounts of solid waste requiring disposal in a landfill. For these reasons, operation of the proposed Project modifications would not exceed existing water supply, wastewater or

landfill capacities, and impacts would not cause new significant operational impacts to water supply, wastewater, or solid waste beyond the impacts disclosed in the Final EIR.

Energy (diesel fuel and electricity) would be used during construction of the proposed Project modifications. Energy expenditures during construction would be short term in duration, and construction would not result in substantial waste or inefficient use of energy as construction would be competitively bid, which would facilitate efficiency in all construction stages. Current LAHD bid specifications include provisions to reduce energy consumption, such as staging work during non-peak hours when appropriate. Additionally, the proposed Project modifications would incorporate energy conservation measures in compliance with California's Building Code CCR Title 24 that requires building energy efficient standards for new construction. The Final EIR determined that the original Project, which would provide new energy distribution infrastructure required to support terminal operations, would not exceeding existing electricity supplies or result in the need for major new facilities. The proposed Project modifications, which would generate operational demands for electricity associated with the crane building, ASC runs and general site maintenance, would utilize the energy infrastructure provided by the original Project and would not require new, offsite energy supply facilities to be constructed. Consequently, the proposed Project modifications would not cause new significant energy impacts beyond the impacts disclosed in the Final EIR.

9.12 WATER QUALITY, SEDIMENTS AND OCEANOGRAPHY

Final EIR and First EIR Addendum Conclusions

Impacts to water quality from possible spills and discharges, stormwater runoff, risk of flooding, and sediments, were analyzed in the Final EIR. Project-related construction is not expected to create pollution, contamination, a nuisance, or violate any water quality standards, and impacts to water quality from in-water construction activities and disposal would be less than significant. Spills or leaks that occur on land would be contained and cleaned up before any impacts to surface water quality can occur. Spills from dredges or barges could directly affect water quality within West Basin, resulting in a visible film on the surface of the water; however, the probability of an accidental spill from a vessel to the Harbor that would cause a nuisance or adversely affect beneficial uses is low. Therefore, accidental spills of pollutants would cause less than significant impacts.

The Final EIR found that the Project would not increase the potential for flooding or increase risks to humans, property, or sensitive biological resources. Therefore, impacts from flooding would be less than significant.

Project operations would not substantially increase impermeable surfaces, alter the topography of the site, or reduce the capacity of the existing stormwater conveyance systems. Project construction activities and operations would not result in a permanent adverse change in surface water movement because these activities would not impose barriers to water

movement into and out of the West Basin, and impacts to water quality and oceanography would be less than significant.

Project-related construction activities and operations would not accelerate natural processes of wind and water erosion because best management practices, such as sediment basins and traps, barriers, inlet protection, and other standard soil management procedures, would be implemented to minimize erosion soil deposition in the harbor. Therefore, impacts to water quality would be less than significant.

The Final EIR found that operation of the Project could create pollution, contamination, or a nuisance as defined in Section 13050 of the Porter-Cologne Water Quality Control Act (CWC) or cause regulatory standards to be violated in harbor waters because there is potential for an increase in incidental spills and illegal discharges due to increased vessel calls at the terminal. Leaching of contaminants such as copper, from anti-fouling paint could also cause increased loading in the harbor which is listed as impaired with respect to copper. Although impacts from upland spills and stormwater were found to be less than significant, the Final EIR identified two mitigation measures that were subsequently modified as conditions of approval that would be subject to monitoring provisions for enforcement and compliance purposes. The Final EIR acknowledged these measures are intended as conditions for approval as part of Port-wide efforts to maintain high water quality conditions, and not as mitigation measures to reduce the level of significance associated with project-specific impacts to water quality.
One of the conditions of approval is measure WQ-2 and requires that the design of all terminal facilities whose operations could result in the accidental release of toxic or hazardous substances (including sewage and liquid waste facilities, solid and hazardous waste disposal facilities) comply with the state Non-Point Source (NPS) Pollution Control Program. Based on the CEQA Findings contained in the record when the Board certified the Final EIR and approved the TraPac project, it was recognized that operational sources of pollutants that could affect water quality in the West Basin is accidental spills on land that enter storm drains and accidental spills or illegal discharges from vessels while in the West Basin. Potential releases of pollutants from a large spill on land to harbor waters and sediments would be minimized through existing regulatory controls and are unlikely to occur during the life of the Project. Therefore, the rationale for requiring measure WQ-2 as a condition of project approval was to ensure compliance with the NPS Pollution Control Program and other applicable water quality regulations.

The other condition of approval included in the Final EIR is measure WQ-3 which requires the development of an approved Source Control Program (SCP) with the intent of preventing and remediating accidental fuel releases in accordance with Port guidelines established in the General Marine Oil Terminal Lease Renewal Program. The SCP shall address immediate leak detection, tank inspection, and tank repair. As a condition of the lease, TraPac would be required to submit to the Port an annual compliance/performance audit of the SCP in conformance with the Port's standard compliance plan audit procedures. This audit would identify compliance with regulations and best management practices to ensure minimizing of spills that might affect water quality, or soil and groundwater. The justification and rationale

for this measure is not clear in the CEQA Findings and does not appear to relate to any construction or operational activities of the Project as analyzed in the Final EIR. Specifically, the CEQA Findings summarize the Port being governed by the Los Angeles Harbor District Risk Management Plan (RMP) which provides a methodology for assessing and considering risk during the siting process for facilities that handle substantial amounts of dangerous cargo, such as liquid bulk facilities. The Findings describe that a Release Response Plan is prepared in accordance with the Hazardous Material Release Response Plans and Inventory Law (California Health and Safety Code, Chapter 6.95), which is administered by the City of Los Angeles Fire Department (LAFD) who also regulate hazardous material activities within the Port. Furthermore, a Spill Prevention, Control, and Countermeasure (SPCC) Plan would be prepared and implemented prior to the start of demolition, dredging, and construction activities along with an Oil Spill Contingency Plan (OSCP), which would be reviewed and approved by the California Department of Fish and Game Office of Spill Prevention and Response, in consultation with other responsible agencies. The SPCC Plan would detail and implement spill prevention and control measures to prevent oil spills from reaching navigable waters. However, all of these regulatory controls described above and in the CEQA Findings were assumed to be in full compliance during construction and operation of the Project to ensure that releases of pollutants to harbor waters and sediments would be minimized or avoided. The Final EIR does not describe any components of the Project such as underground pipelines or tanks or any operational activities that would be subject to an SCP which is intended for liquid bulk facilities like a marine oil terminal.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal did not find any new impacts or increase in severity of previously identified impacts to water quality/sediments/oceanography because replacing diesel equipment with cleaner zero and near-zero emissions equipment along with the associated infrastructure would be built and operated in the same location and manner as previously analyzed in the Final EIR. Because the First Addendum did not change the findings and conclusions of the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

As disclosed in the Final EIR, the TraPac project would have significant water quality impacts that would be mitigated to less-than-significant levels. As discussed below, the proposed Project modifications would have minor impacts on water quality, and therefore would not cause new or substantially more severe significant impacts on water quality beyond the impacts disclosed in the Final EIR.

The proposed Project modifications would result in minor impacts to water quality from possible spills and discharges, stormwater runoff, risk of flooding, and sediments. Project-related construction is not expected to create pollution, contamination, a nuisance, or violate any water quality standards because adherence to measure WQ-2 and compliance with regulatory controls would minimize or avoid such impacts. Additionally, there would be no in-

water construction activities or dredging that could affect water quality or sediments. Implementation of the proposed Project modifications would cause new onsite utility lines for water and wastewater to be constructed, and the relocation and/or extension of some existing utility lines could also occur. All infrastructure improvements and connections would occur within City streets, would comply with the City's municipal code, and would be performed under permit by the City's BOE and/or LADWP. The proposed Project modifications would not change terminal operations or rail activity in a manner that would cause or contribute to adverse changes in surface water movement, erosion, or an increase in incidental spills and illegal discharges due to increased vessel calls at the terminal or rail activity.

9.13 CUMULATIVE IMPACTS

Final EIR and First EIR Addendum Conclusions

The Final EIR found the TraPac Project, with all mitigation measures imposed, would have cumulatively considerable contributions to significant cumulative impacts related to 1) air pollutant emissions during construction and long-term operations; 2) odor emissions from Project operations at the nearest sensitive receptor from diesel and residual fuels and stationary industrial sources; 3) toxic air contaminants from construction and operation that exceed acceptable public health criteria; 4) greenhouse gas emissions from Project construction and operation; 5) disruption of local biological communities from in-water disturbances such as dredging and wharf construction, landfilling that would remove marine habitat and disturb adjacent habitats in the Harbor, runoff from construction activities, and potential for introduction of exotic species via vessel hulls; 6) cultural resources from construction activities that could disturb unknown, intact subsurface prehistoric or historic archaeological resources related to upland Port projects including the South Wilmington Grade Separation (Related Project List #24), Avalon Boulevard Corridor Development (Related Project List #25), and "C" Street/Figueroa Street Interchange (Related Project List #26) on the periphery of the Port (i.e., in upland areas); 7) substantial damage or exposure to substantial risk following a seismic event, substantial risk to structures and people from local or distant tsunamis or seiches; 8) construction activities causing a substantial increase in ambient noise levels at sensitive receivers related to the "C" Street/Figueroa Street Interchange (Related Projects List #26) located immediately adjacent to the Harry Bridges Boulevard widening element of the Project and the Harry Bridges Buffer Area; 9) short-term, temporary increases in construction truck and auto traffic, and an increase in rail activity that causes delay in traffic at the Avalon Boulevard and Henry Ford Avenue at-grade crossing; 10) substantial solid waste, water, and/or wastewater demands that would exceed the capacity of existing facilities; and 11) potential to create pollution, cause nuisances, or violate applicable water quality standards due to risks of a large, accidental spill impacting the harbor, in-water construction components such as dredging and pier upgrades, and accidental spills and illegal vessel discharges that would increase in proportion to increased vessel traffic.

Additionally, the First EIR Addendum that analyzed the electrification of operational equipment in portions of the terminal to enhance operational efficiencies by switching to cleaner zero and near-zero emissions equipment, which are environmentally preferred technologies, did not find any new or worsening of cumulatively considerable impacts to the same resource areas that were analyzed in the Final EIR. Electric RMG cranes rather than diesel RTG cranes and the use of diesel electric shuttles to move containers in and out of the stacks from the wharf side gantry cranes to the stacks and/or the on-dock railyard would be built in the same location, would be of similar appearance and scale, and would provide essentially the same function only with cleaner and newer equipment. Because the First Addendum did not change the cumulative impact findings and conclusions of the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR, the impact analysis below primarily compares the proposed Project modifications to the conclusions of the Final EIR.

Proposed Project Modifications

Air Quality and Greenhouse Gases

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to 1) air pollutant emissions during construction and long-term operations; 2) odor emissions from Project operations at the nearest sensitive receptor from diesel and residual fuels and stationary industrial sources; 3) toxic air contaminants from construction and operation that exceed acceptable public health criteria; and 4) greenhouse gas emissions from Project construction and operation. With regard to air pollutant emissions during construction and long-term operations (Item 1), the proposed Project modifications would increase emissions relative to original mitigated project for all criteria pollutants in 2016 (the first year of construction); NOx, CO, and VOC in 2017 and 2018; NOx and VOC in 2019 and 2025; and VOC in 2038. However, even after accounting for these emission increases relative to the original project, terminal-wide emissions of all criteria pollutants would remain well below 2003 baseline levels, resulting in a beneficial air quality impact. With regard to odor emissions (Item 2), the proposed Project modifications would decrease emissions of diesel PM10 and PM2.5 (the primary source of odors) relative to the original mitigated project in all analysis years except 2016. Terminal-wide emissions in 2016 would increase by less than 1 percent relative to the original project. Moreover, terminal-wide emissions of PM10 and PM2.5 would remain well below 2003 baseline levels, resulting in a beneficial air quality impact. With regard to toxic air contaminants (Item 3), the TraPac terminal emissions over the lifetime of the proposed Project modifications would be much less than the original project, even after accounting for the comparatively small emission increases for some pollutants during the construction period. With regard to greenhouse gas emissions (Item 4), the accumulated CO2e emissions over the lifetime of the proposed Project modifications would be greatly reduced compared to what was predicted for the original project in the Final EIR.

Furthermore, the potential reductions in emissions resulting from fewer train delays and improved efficiency in train loading/unloading operations were not quantified in this Second

Addendum. This potential reduction in train emissions would further reduce the cumulative air quality impacts identified in the Final EIR.

Although the air quality analyses in this Second EIR Addendum focus on the impacts of the proposed Project modifications relative to the Final EIR, the combined cumulative impacts of the First and Second EIR Addendum are considered here. As discussed previously, the First Addendum involved the replacement of existing diesel CHE with electric RMG cranes and diesel electric shuttles. It found that overall emissions would be significantly lower than what was predicted in the Final EIR and would be subject to the same mitigation that was already identified in the Final EIR. As a result, the combined cumulative impacts of the First and Second EIR Addendum would be lower than those of the First EIR Addendum alone.

For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant impacts on air quality (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Biological Resources

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to significant biological impacts. The proposed Project modifications do not involve any in- or over-water work and thus would not contribute to significant cumulative impacts to biological resources. Therefore, they would not cause the original project's incremental contributions to significant biological cumulative impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Cultural Resources

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to significant cultural resources impacts. The proposed Project modifications would not affect any buildings or structures with the exception of the existing crane maintenance building, which is 29 years old and not eligible for listing in the NRHP or the CRHR, and is also not eligible for local designation as a city of Los Angeles HCM. Furthermore, as the proposed sites consist of pavement, open ground and/or existing rail track, the proposed Project modifications would not contribute to significant cumulative impacts to architectural resources.

There are no known archeological sites within the original Project area, as well as no evidence of historic archeological material being identified during previous cultural resource site record and literature searches. The only area identified in the Final EIR as having the potential to contain paleontological resources is the Harry Bridges Buffer Area between Harry Bridges Boulevard and "C" Street. Excavation and ground disturbance associated with the proposed Project modifications would be limited to the terminal and rail yard and would not occur in this area. The only proposed Project modification not contained within the footprint of the original TraPac Project is the rail improvement adjacent to the Dominguez Channel. This improvement

consists of re-aligning existing track and constructing new track directly adjacent to the existing track. Given the site's history of extensive ground disturbance and industrial land use, it is reasonable to assume that the potential of discovering significant unknown archeological or paleontological deposits would be remote. In the unlikely event that such resources are encountered during construction, adherence to mitigation measure CR-1 and CR-2 would ensure that impacts remain less than significant. Furthermore, the Wilmington Grade Separation (Related Project List #24) has been completed and no cultural resources were encountered during construction. The "C" Street/Figueroa Street Interchange (Related Project List #26) will be completed this year and although mitigation is in place to protect unknown cultural resources, no impacts have occurred from this project. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant impacts on archeological or paleontological resources (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Geology

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to significant seismic, tsunami, and seiche-related impacts. Construction and operation of the proposed Project modifications would not create any new or worsen the impacts from seismic activity. The proposed Project modifications would not change the use or operations of the terminal that have already been identified as likely to expose people or property to substantial damage or substantial injuries in the event of a tsunami or seiche. Mitigation measure GEO-1 would be adhered to during construction of the proposed Project modifications. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant impacts on geologic hazards (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Hazards

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to health hazards impacts. The proposed Project modifications are minor in scale compared to the overall Project, and would not change terminal or rail operations in a manner that would impact public health and safety from fires, explosions, and releases of hazardous materials. The terminal would continue to operate as a container terminal, the number of existing shoreside cranes would not change, the proposed rail improvements would reduce rail congestion, and Project operations would be subject to current emergency response and evacuation systems implemented by the Los Angeles Fire Department and Police Department. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant health hazard impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Land Use

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to land use impacts due to the potential to disrupt, divide, or isolate existing neighborhoods, communities, or land uses. The proposed Project modifications are minor in scale compared to the overall TraPac Project, and would not require any changes in land use or zoning. Most of the improvements would be located within the terminal which is heavy industrial and the proposed rail improvements would be adjacent to existing rail trackage that is already in operation. In addition, mitigation measures LU-1 and LU-2 have already been implemented. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant land use impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Noise

The Final EIR disclosed that the TraPac project construction would have cumulatively considerable contributions to noise impacts. The proposed Project modifications would have construction limited to daytime hours in accordance with Los Angeles Municipal Code requirements. The proposed Project modifications are minor in scale compared to the overall Project and would be located within the terminal which is heavy industrial, and the proposed rail improvements would be adjacent to existing rail trackage that is already in operation. Although the proposed Project modifications would result in new construction during 2016-2018 which would overlap with some construction that is currently being completed as part of the overall TraPac development project, the buffer has already been constructed and provides a physical barrier between the terminal and residential areas such that noise from terminal operations combined with the new construction is likely to be lower than what the Final EIR and First Addendum projected. Operational noise is not expected to change from what was analyzed in the Final EIR and may further decrease with greater use of electrified equipment rather than diesel equipment as analyzed in the First Addendum. Furthermore, mitigation measure NOI-2 has already been implemented to provide a landscaped buffer along the northwest side of the relocated PHL switching rail yard at Berth 200 and noise monitoring has been completed which confirmed that there was no exceedance of the City's noise ordinance at the marinas in the consolidated slip from operation of the relocated PHL switching rail yard. Given that the proposed Project modifications include additional use of electrified equipment beyond what was considered in the First Addendum, long-term operational noise is expected to decrease at the terminal. There would be no change to the existing number of shoreside cranes in operation. Reduced train delays from the railroad track improvements would also translate into reduced operational noise from less train idling. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant noise impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Transportation

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to ground transportation impacts related to short-term, temporary increases in construction truck and auto traffic, and an increase in rail activity that would cause a delay in traffic at the Avalon Boulevard and Henry Ford Avenue at-grade crossing.

The proposed Project modifications include new construction during 2016-2019 which would overlap with some construction that is currently being completed as part of the overall TraPac project. In order to minimize impacts to the study area roadway system during project modification construction, implementation of Mitigation Measure TRANS-1 requires the construction contractor to prepare a detailed traffic management plan. Once fully operational in 2019, after modernization of the final 25 acres of backlands, raised shoreside cranes, and associated rail improvements, the proposed Project modifications would not result in any new impacts to transportation/circulation because there would be no change in terminal throughput or rail activity as analyzed in the Final EIR.

In addition, some of the transportation mitigation measures have been or will be completed to respond to the anticipated growth, and would further reduce the proposed Project modifications' construction traffic impacts.. Specifically, mitigation measure TRANS-3 which calls for improvements to Alameda Street and Anaheim Street by 2015 will be completed in 2018. Mitigation measures TRANS-6 and TRANS-7 that call for improvements to freeway ramp/arterial interchanges along State Route-47/Interestate-110 at John S. Gibson Blvd and C Street/Figueroa Street are scheduled for completion in 2016. The Harry Bridges Boulevard realignment and Wilmington Grade Separation have already been completed. The remaining transportation mitigation measures (TRANS-2, -4, and -5) are not required until prior to 2038 when the TraPac terminal is at full capacity.

Furthermore, the proposed rail segment improvements would improve the efficiency of the rail network and reduce train delays. The rail simulation completed for this Second Addendum found the rail road track extension between the TraPac lead track and San Pedro main line track would reduce train delays (moving and idling, in aggregate) by approximately 36 hours/day. Similarly, the second rail track along the Dominguez Channel between Anaheim Street and Henry Ford Avenue would reduce train delays (moving and idling, in aggregate) by approximately one hour/day. Although these reductions in delay would occur at the specified locations, they would generally reduce bottlenecks in the system. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant transportation impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Public Services and Utilities

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to water supply and solid waste impacts. The proposed Project modifications would generate minimal increased demands for water consumption associated with onsite usage (restrooms and sinks in the crane building) and site maintenance (washing). The current crane building would be demolished and replaced with a building similar in footprint and purpose, and none of the modifications include major water-consuming industrial or commercial processes. The volume of construction solid waste associated with the proposed Project modifications is not quantifiable but would be small relative to the total volume of construction waste disclosed in the Final EIR and implementation of mitigation measures PS-1 through PS-3 requiring recycling of construction materials, use of construction materials with recycled content, and compliance with the California Solid Waste Management Act (Assembly Bill 939) would ensure that solid waste impacts remain less than significant. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant water supply and solid waste impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

Water Quality, Sediments, and Oceanography

The Final EIR disclosed that the TraPac project would have cumulatively considerable contributions to water quality impacts. The proposed Project modifications would result in minor impacts to water quality from possible spills and discharges, stormwater runoff, risk of flooding, and sediments. Project-related construction is not expected to create pollution, contamination, a nuisance, or violate any water quality standards because adherence to measure WQ-2 and compliance with regulatory controls would minimize or avoid such impacts. Additionally, there would be no in-water construction activities or dredging that could affect water quality or sediments. The proposed Project modifications would not change terminal operations or rail activity in a manner that would cause or contribute to adverse changes in surface water movement, erosion, or an increase in incidental spills and illegal discharges due to increased vessel calls at the terminal or rail activity. For the reasons described above, the proposed Project modifications would not cause the original project's incremental contributions to significant water quality impacts (as described in the Final EIR) to be substantially more cumulatively considerable than disclosed in the Final EIR.

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Appendix A: Air Quality Calculations for Proposed Project Modifications

Table A-1. Final EIR Annual Operational CHE Emissions on 25 Acres of Backlands

Analysis Year	Annual TEU (25 acres)	PM10 (ton/yr)	PM2.5 (ton/yr)	NOx (ton/yr)	SOx (ton/yr)	CO (ton/yr)	VOC (ton/yr)	CO2 (MT/yr)	N2O (MT/yr)	CH4 (MT/yr)	CO2e (MT/yr)
2016 (Sep-Dec)	114,372	0.04	0.04	0.85	0.01	5.62	0.68	1,454	0.02	0.24	1,465
2017	355,265	0.14	0.12	2.70	0.04	17.81	1.94	4,639	0.05	0.75	4,674
2018	367,415	0.14	0.13	2.86	0.04	18.76	1.86	4,917	0.06	0.80	4,953
2019	379,564	0.15	0.14	3.02	0.04	19.72	1.77	5,194	0.06	0.84	5,233
2025	452,462	0.20	0.18	3.99	0.06	25.47	1.26	6,860	0.08	1.11	6,912
2038	452,462	0.20	0.18	3.99	0.06	25.47	1.26	6,860	0.08	1.11	6,912

Notes:

1. EIR emissions and annual TEU are prorated based on the ratio of acreage (i.e., 25 acres for the backland improvements / 132 total automated terminal acreage).
2. Emissions are adjusted by a factor of 0.76 to reflect updated load factors since the 2007 Final EIR.
3. For emission comparison purposes, Year 2016 emissions and annual TEU are scaled by 4/12 to reflect 4 months of operation (Sep-Dec) to match the start of construction of the Proposed Backlands Electrification/Modernization and Rail Improvements.
4. Source: Final EIR Table D1.2.PPMit-42 and Table XX-PPMit-33.
5. Year 2016-2019 TEU and emissions are interpolated.

Table A-2. Final EIR Peak Daily Operational CHE Emissions on 25 Acres of Backlands

Analysis Year	PM10 (lb/day)	PM2.5 (lb/day)	NOx (lb/day)	SOx (lb/day)	CO (lb/day)	VOC (lb/day)
2016	3.3	3.0	64.4	0.9	428.3	52.5
2017	3.4	3.1	66.4	0.9	439.5	49.5
2018	3.5	3.2	68.5	0.9	450.8	46.6
2019	3.6	3.3	70.6	1.0	462.0	43.7
2025	4.2	3.9	83.0	1.2	529.4	26.2
2038	4.2	3.9	83.0	1.2	529.4	26.2

Notes:

1. EIR emissions and annual TEU are prorated based on the ratio of acreage (i.e., 25 acres for the backland improvements / 132 total automated terminal acreage).
2. Emissions are adjusted by a factor of 0.76 to reflect updated load factors since the 2007 Final EIR.
3. Source: Final EIR Table 3.2-26.
4. Year 2016-2019 emissions are interpolated.

Table A-3. Annual Construction Emissions for the Proposed Backlands Electrification/Modernization and Rail Improvements

Analysis Year	PM10 (ton/yr)	PM2.5 (ton/yr)	NOx (ton/yr)	SOx (ton/yr)	CO (ton/yr)	VOC (ton/yr)	CO2 (MT/yr)	N2O (MT/yr)	CH4 (MT/yr)
2016	0.19	0.06	0.67	0.004	2.35	0.12	369	0.00	0.04
2017	0.34	0.14	2.56	0.032	17.21	0.53	2,911	0.00	0.76
2018	0.62	0.24	5.52	0.031	11.26	0.45	2,754	0.00	0.40
2019	0.08	0.03	0.43	0.003	0.98	0.04	233	0.00	0.03

Notes:

1. Emissions were calculated using CalEEMod, version 2013.2.2.
2. All offroad construction equipment is assumed to be Tier 4 Final.
3. Construction is assumed to begin September 2016.

Table A-4. Peak Daily Construction Emissions for the Proposed Backlands Electrification/Modernization and Rail Improvements

Time Period	Active Phases	PM10 (lb/day)	PM2.5 (lb/day)	NOx (lb/day)	SOx (lb/day)	CO (lb/day)	VOC (lb/day)
2016 Sep - Dec	1	3.69	1.13	12.60	0.08	44.69	2.33
2017 Jan - Feb	1	4.26	1.27	12.05	0.09	47.16	8.40
2017 Mar - Jul	2, 3	4.31	1.96	28.44	0.32	167.98	4.28
2017 Aug - Dec	3	1.92	0.76	18.61	0.26	139.90	3.46
2018 Jan - Mar	3, 4	5.65	2.25	62.58	0.30	93.22	4.41
2018 Apr - Sep	4	7.64	2.95	63.38	0.34	116.46	4.97
2018 Oct - Dec	5	6.82	2.59	54.23	0.32	120.92	4.57
2019 Jan - Feb	5	8.79	3.04	49.88	0.30	110.64	4.29

Notes:

1. Emissions were calculated using CalEEMod, version 2013.2.2.
2. All offroad construction equipment is assumed to be Tier 4 Final.

Table A-5. New Hybrid Straddle Carrier Emissions

Year	Model Year	Number of Equip.	Diesel Engine Rated Size (kW)	Annual Hours per Unit	Cum. Hours	Load Factor	Tons/year								Metric Tons/year		
							PM	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	N2O	CH4
2017	2017	10	77	1,025	1,025	0.456	0.005	0.004	0.005	0.138	0.003	1.475	0.024	0.025	274	0.008	0.014
2018	2017	10	77	2,544	5,088	0.456	0.014	0.013	0.014	0.361	0.009	4.044	0.104	0.110	681	0.020	0.034
2019	2017	10	77	2,628	7,885	0.456	0.016	0.014	0.016	0.385	0.009	4.451	0.140	0.147	703	0.021	0.035
2025	2017	10	77	3,133	12,000	0.456	0.022	0.020	0.022	0.482	0.011	5.783	0.223	0.235	838	0.025	0.042
2038	2017	10	77	3,133	12,000	0.456	0.022	0.020	0.022	0.482	0.011	5.783	0.223	0.235	838	0.025	0.042

Notes:

1. Annual hours per unit are scaled from 2014 actual operating hours for existing straddle carriers at the TraPac terminal based on relative EIR TEU throughput projections, relative existing and proposed automated acreages, and the relative number of units (17 existing diesel units; 10 proposed new diesel hybrid units). For 2017, assumed 5 months of operation.
2. VOC was scaled from HC using EPA's conversion factor: VOC/THC = 1.053 for diesel engines. Source: EPA. *Conversion Factors for Hydrocarbon Emission Components.* Assessment and Standards Division. Office of Transportation and Air Quality. EPA-420-R-10-015. NR-002d. July 2010.
3. Load factor for hybrid straddle carriers is derived based on 2.6 gallons per hour fuel consumption rate provided by the manufacturer and an average brake specific consumption rate of 0.41 lbs/hp-hr for diesel engines.

Table A-6. New Electric Automated Stacking Crane GHG Emissions

Year	Model Year	Number of Equip.	Electric Motor Average Consumption (kW) [1]	Annual Hours per Unit [2]	Annual Electricity Consumption (kW-Hr/yr)	Metric Tons/year		
						CO2	N2O	CH4
2018	2018	7	150	4,446	4,668,182	2,405	0.013	0.061
2019	2018	7	150	6,124	6,430,066	3,313	0.018	0.085
2025	2018	7	150	7,300	7,665,000	3,051	0.021	0.101
2038	2018	7	150	7,300	7,665,000	3,051	0.021	0.101

Notes:

1. Average power consumption per unit while operating was provided by TraPac (Scott Axelson, 9/22/2015).
2. Assumed 20 hours of operation per unit (TraPac, Scott Axelson, 9/22/2015) in 2038, at full terminal TEU capacity. Operational hours for other years are scaled by relative TEU throughput. Year 2018 assumes only 9 months of operation post-construction.

Table A-7. Emission factors for Hybrid Straddle Carriers

Description	Model Year	PM	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Emission Factor (g/kWh)	2015+	0.0134	0.012	0.0134	0.3621	0.08	3.62	0.0671	762	0.024	0.053
Deterioration Rate	2015+	6.30E-07	5.80E-07	6.30E-07	4.77E-06	0	9.58E-05	1.57E-05	0	0	0
Fuel Correction Factors	2015+	0.852	0.852	0.852	0.948	0.11	1	0.72	1	0.948	0.72

Note:

1. Emission factors, deterioration rates and fuel correction factors are based on 2014 EI for POLA.

Table A-8. GHG Emission Factors for Electricity Consumption (Automated Stacking Cranes, OGV AMP)

Description	Analysis Years	CO2	N2O	CH4
Emission Factor (lbs/MWh)	≤ 2019	1,135	0.00617	0.029
Emission Factor (g/kWh)		515.290	0.003	0.013
Emission Factor (lbs/MWh)	≥ 2020	877	0.00617	0.029
Emission Factor (g/kWh)		397.989	0.003	0.013

Notes:

1. The 2013 CO2 emission factor for LADWP (most recent available) is from the *2014 Power Integrated Resource Plan* (LADWP, December 2014), Table C-1. Website: https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-power/a-p-integratedresourceplanning/a-p-irp-documents?_adf.ctrl-state=133yqruddt_4&_afrLoop=998364079749172. Website accessed 8/4/2015.
2. N2O and CH4 emission factors are from the CalEEMod User's Guide (CAPCOA, July 2013), Appendix D (September 2013), Table 1.2.
3. The 2020 CO2 emission factor assumes 33% renewable energy in compliance with the Renewable Portfolio Standard. Estimated by projecting out percent of renewable energy included in the utility's Power/Utility Protocol (PUP) report, available at: http://www.climateregistry.org/tools/carrot/carrot-public-reports.html.

Table A-9. Retained Diesel CHE Emissions

Analysis Year	CHE Type	No. Retained Diesel CHE	KW	Annual Hours	Cum Hours	Load Factor	Tons/Year								Metric Tons/Year		
							PM10	PM2.5	DPM	NOx	SOx	CO	HC	VOC	CO2	N2O	CH4
2018	Yard tractors	5	157	390	12000	0.39	0.001	0.001	0.001	0.035	0.001	0.214	0.008	0.008	91	0.001	0.002
2018	Top handler	2	243	390	12000	0.59	0.002	0.002	0.002	0.049	0.001	0.188	0.023	0.024	85	0.002	0.004
2018	Forklifts	2	149	390	12000	0.3	0.001	0.001	0.001	0.015	0.000	0.062	0.007	0.007	27	0.001	0.001
2018	Man-Lifts	3	113	390	12000	0.51	0.001	0.001	0.001	0.030	0.001	0.177	0.014	0.014	51	0.002	0.003
2018	**All**	**12**					**0.005**	**0.005**	**0.005**	**0.129**	**0.003**	**0.641**	**0.051**	**0.054**	**254**	**0.006**	**0.009**
2019	Yard tractors	5	157	537	12000	0.39	0.002	0.002	0.002	0.048	0.002	0.295	0.011	0.012	125	0.002	0.002
2019	Top handler	2	243	537	12000	0.59	0.003	0.003	0.003	0.068	0.001	0.259	0.031	0.033	118	0.003	0.005
2019	Forklifts	2	149	537	12000	0.3	0.001	0.001	0.001	0.021	0.000	0.086	0.010	0.010	37	0.001	0.002
2019	Man-Lifts	3	113	537	12000	0.51	0.002	0.002	0.002	0.041	0.001	0.244	0.019	0.020	71	0.002	0.004
2019	**All**	**12**					**0.008**	**0.007**	**0.008**	**0.178**	**0.004**	**0.883**	**0.071**	**0.075**	**350**	**0.008**	**0.013**
2025	Yard tractors	5	157	640	12000	0.39	0.002	0.002	0.002	0.058	0.002	0.351	0.013	0.014	149	0.002	0.002
2025	Top handler	2	243	640	12000	0.59	0.003	0.003	0.003	0.081	0.002	0.309	0.037	0.039	140	0.003	0.006
2025	Forklifts	2	149	640	12000	0.3	0.001	0.001	0.001	0.025	0.001	0.102	0.012	0.012	44	0.001	0.002
2025	Man-Lifts	3	113	640	12000	0.51	0.002	0.002	0.002	0.049	0.001	0.290	0.022	0.024	84	0.003	0.004
2025	**All**	**12**					**0.009**	**0.008**	**0.009**	**0.212**	**0.005**	**1.052**	**0.084**	**0.089**	**418**	**0.009**	**0.015**
2038	Yard tractors	5	157	640	12000	0.39	0.002	0.002	0.002	0.058	0.002	0.351	0.013	0.014	149	0.002	0.002
2038	Top handler	2	243	640	12000	0.59	0.003	0.003	0.003	0.081	0.002	0.309	0.037	0.039	140	0.003	0.006
2038	Forklifts	2	149	640	12000	0.3	0.001	0.001	0.001	0.025	0.001	0.102	0.012	0.012	44	0.001	0.002
2038	Man-Lifts	3	113	640	12000	0.51	0.002	0.002	0.002	0.049	0.001	0.290	0.022	0.024	84	0.003	0.004
2038	**All**	**12**					**0.009**	**0.008**	**0.009**	**0.212**	**0.005**	**1.052**	**0.084**	**0.089**	**418**	**0.009**	**0.015**

Notes:

1. All equipment is assumed to be Tier 4 per the Trapac EIR.
2. Year 2018 annual operating hours assume 9 months of operation (Apr - Dec). Equipment is assumed to operate 10 hr/week per unit in 2018.
3. Years 2019, 2025 and 2038 annual operating hours were scaled up based on projected TEU throughput in EIR.
4. VOC was scaled from HC using EPA's conversion factor: VOC/THC = 1.053. Source: http://www.epa.gov/otaq/models/nonrdmdl/nonrdmdl2010/420r10015.pdf.

Table A-10. Tier 4 Emission Factors, Deterioration Rates, and Fuel Correction Factors for Retained Diesel CHE

Parameter	CHE Type	kW	PM10	PM2.5	DPM	NOx	SOx	CO	HC	CO2	N2O	CH4
Emission Factor (g/kWh)	Yard Tractors	157	0.009	0.008	0.009	0.2426	0.08	1.2337	0.0221	762	0.0106	0.0175
	Top Handlers	243	0.0134	0.012	0.0134	0.3621	0.07	1.23	0.0671	762	0.02	0.047
	Forklift	149	0.0134	0.012	0.0134	0.3621	0.08	1.23	0.0671	762	0.024	0.053
	Man-Lift	113	0.0134	0.012	0.0134	0.3621	0.08	1.23	0.0671	762	0.024	0.053
Deterioration Rate	Yard Tractors	157	3.30E-07	3.10E-07	3.30E-07	3.20E-06	0	3.26E-05	5.18E-06	0	0	0
	Top Handlers	243	5.00E-07	4.60E-07	5.00E-07	4.77E-06	0	2.44E-05	1.57E-05	0	0	0
	Forklift	149	5.00E-07	4.60E-07	5.00E-07	4.77E-06	0	3.26E-05	1.57E-05	0	0	0
	Man-Lift	113	6.3E-07	5.80E-07	6.3E-07	4.77E-06	0	9.58E-05	1.57E-05	0	0	0
Fuel Correction Factors	Offroad Diesel		0.852	0.852	0.852	0.948	0.11	1	0.72	1	0.948	0.72

Source: 2014 EI for POLA.

Table A-11. Operational Peak Daily Factors for Hybrid Straddle Carriers and Retained Diesel CHE

Year	Peak daily TEU	Total TEU	Peak daily factor
2015	**22,933**	**1,747,500**	4.790
2016	23,123	1,811,650	4.659
2017	23,312	1,875,800	4.536
2018	23,502	1,939,950	4.422
2019	23,692	2,004,100	4.315
2025	**24,830**	**2,389,000**	3.794
2038	**24,830**	**2,389,000**	3.794

Notes:

1. Source: 20007 Final EIR, Appendix D1, Table D1.2PP-PD38.
2. Years 2016-2019 are interpolated.
3. Peak daily emissions (lb/day) = [Annual Emissions (ton/yr)] x [2000 lb/ton] / [365 days/yr] x [Peak Daily Factor].

Table A-12. Assumptions Used for Annual OGV Emission Calculations

Year	Shoreside Crane Raise Assumptions			Final EIR Assumptions		
	2017	**2025**	**2038**	**2015**	**2025**	**2038**
TEU (1)	1,875,800	2,389,000	2,389,000	1,747,500	2,389,000	2,389,000
Size of Vessels (2)	Cont 4K, 5K, 6K, 8K, 12K, 14K, Gen Cargo	Cont 4K, 8K, 12K, 14K, Gen Cargo	Cont 4K, 8K, 12K, 14K, Gen Cargo	Cont <3K, 3K-5K, 5K-6K, and 8K-9K	Cont 3K-4K, 5K-6K, 8K-9K	Cont 3K-4K, 5K-6K, 8K-9K
Mitigation Measures:						
- AMP (1)	80%	100%	100%	80%	100%	100%
- Marine Fuel (CARB)	0.1% S	0.1% S	0.1% S	0.2% S (100%)	0.2% S (100%)	0.2% S (100%)
- Vessel Speed (3)	2015 Average Speed by vessel size (10.6-11.0 kts inside 40 nm)	2015 Average Speed by vessel size (10.6-11.0 kts inside 40 nm)	2015 Average Speed by vessel size (10.6-11.0 kts inside 40 nm)	95% VSRP	95% VSRP	95% VSRP
- Engine Tier level (4)	2015 Tier profile for Cont 8K, 6K, 5K, 4K, Gen Cargo; Tier 2 assumed for 12K and 14K vessels	Cont 4K/8K/12K/14K: T2 General Cargo: T1	Cont 12K/14K: 67% T3 & 33% T2; Cont 8K/4K: 87% T3 & 13% T2: Gen Cargo: T1	No; not modelled	No; not modelled	No; not modelled
- Slide Valves (5)	No	No	No	95%	95%	95%

(1) TEUs are consistent with Final EIR projections. AMP percentages are consistent with Final EIR Mitigation Measure AQ-6.

(2) 2017 vessel mix for the Crane Raise improvements is based on 2015 vessel mix profile and proposed deployment of 12K and 14K vessels. In 2015/2038, it is assumed that the few calls made by 5K and 6K vessels in 2015 will be replaced by 4K and 8K vessels.

(3) Vessel speed profiles for 12K and 14K vessels for the Crane Raise improvements are based on the actual 2015 profile for 8K vessels.

(4) The 2017 Tier profile for the Crane Raise improvements is based on the 2015 Tier profile for Cont 4K, 5K, 6K, & 8K vessels (e.g., 70% Tier 1 and 30% Tier 2 for 8K vessels). Tier 2 and Tier 3 vessel percentages are based on POLA CEQA Terminal Level Container Ship Forecast for Tier 3 Engines, Aug 2015.

(5) No benefits are assumed for slide valves for the Crane Raise improvements, per 2013 EI methodology.

Table A-13. Assumptions Used for Peak Daily OGV Emission Calculations

Year	Shoreside Crane Raise Assumptions			Final EIR Assumptions		
	2017	2025	2038	2015	2025	2038
Number of Vessels	3	3	3	3	3	3
Size of Vessels	Cont 14K, Cont 12K, Cont 8K	Cont 14K, Cont 12K, Cont 8K	Cont 14K, Cont 12K, Cont 8K	Cont 3K-5K, 5K-6K, 8K-9K	Cont 3K-5K, 5K-6K, 8K-9K	Cont 3K-5K, 5K-6K, 8K-9K
Vessels	3 at berth for 24 hours; 2 arrivals or departures (12K and 14K)	3 at berth for 24 hours; 2 arrivals or departures (12K and 14K)	3 at berth for 24 hours; 2 arrivals or departures (12K and 14K)	3 at berth for 24 hours; 2 arrivals or departures (both by 8K-9K)	3 at berth for 24 hours; 2 arrivals or departures (both by 8K-9K)	3 at berth for 24 hours; 2 arrivals or departures (both by 8K-9K)
Mitigation Measures:						
- AMP (1)	AMP for Cont 12K & 14K: No AMP for Cont 8K	All AMPing	All AMPing	AMP for Cont 3K-5K & 8K-9K; No AMP for Cont 5K-6K	All AMPing	All AMPing
- Marine Fuel (CARB)	0.1% S	0.1% S	0.1% S	0.2% S (100%)	0.2% S (100%)	0.2% S (100%)
- Vessel Speed	2015 Average Speed by vessel size (10.6-11.0 kts inside 40 nm)	2015 Average Speed by vessel size (10.6-11.0 kts inside 40 nm)	2015 Average Speed by vessel size (10.6-11.0 kts inside 40 nm)	Both arrivals/departures are VSRP compliant (12 kts inside 40 nm)	Both arrivals/departures are VSRP compliant (12 kts inside 40 nm)	Both arrivals/departures are VSRP compliant (12 kts inside 40 nm)
- Engine Tier level	Tier 1 for 8K vessel; Tier 2 for 12K and 14K vessels	Tier 2 for all three vessels	Tier 3 for 12K & 14K vessel Tier 2 for 8K vessel	No; not modelled	No; not modelled	No; not modelled
- Slide Valves	No	No	No	95%	95%	95%

(1) Per Final EIR Mitigation Measure AQ-6, 80 percent of vessels must use AMP while at berth from 2015-2017, and 100 percent must use AMP starting 2018. Therefore, for peak daily emissions, 2 of the three at-berth vessels are assumed to use AMP prior to 2018, and all 3 vessels are assumed to use AMP 2018-2038.

Table A-14. Final EIR Peak Daily and Annual Operational OGV Emissions

Year	NOx (lb/day)	SOx (lb/day)	PM10 (lb/day)	PM2.5 (lb/day)	VOC (lb/day)	CO (lb/day)	CO2e (MT/yr)
2015	3,581	1,429	109	102	109	667	57,159
2017	3,581	1,429	109	102	109	667	60,286
2018	3,301	1,412	104	96	101	645	61,850
2019	3,301	1,412	104	96	101	645	63,413
2025	3,301	1,412	104	96	101	645	72,795
2038	3,301	1,412	104	96	101	645	72,795

Notes:

1. Source: Final EIR Tables 3.2-26 and 3.2-34 (Mitigated Proposed Project).
2. Peak daily emissions for 2015 are assumed to remain constant in 2017; emissions in 2018 and 2019 were adjusted from 2015 values to reflect 100 percent AMP mitigation.
3. Annual CO2e emissions for 2017, 2018, and 2019 are interpolated.
4. Peak day assumptions include: (a) three vessels at berth (3K-5K, 5K-6K, and 8K-9K TEU) plus two arrivals or departures; (b) two of the three vessels at berth (3K-5K, 8K-9K TEU) use AMP in years 2015-2017, and all three vessels at berth use AMP in years 2018-2038; and (c) both arrivals/departures are VSRP compliant (12 kts inside 40 nm) and involve an 8K-9K vessel.
5. Annual assumptions include: (a) vessel sizes range from <3K to 8K-9K TEU; (b) AMP compliance rate is 80% in 2015, 100% in 2025, and 100% in 2038; (c) VSRP compliance rate is assumed to be 95% all years.
6. The fuel sulfur content is assumed to be 0.2 percent in all years.

Table A-15. Projection of Future TraPac OGV Calls Associated with the Shoreside Crane Raise Improvements

Vessel Category	TEU Capacity	Estimated TEU/Call	2015 Actual Calls	2015 TEUs	2017 Calls	2017 TEUs	2025 Calls	2025 TEUs	2038 Calls	2038 TEUs
Container4000	4,000	5,680	45	255,600	64	364,755	61	344,074	61	344,074
Container5000	5,000	7,100	7	49,700	10	70,925				
Container6000	6,000	8,520	4	34,080	6	48,634				
Container 8000	8,000	11,360	43	488,480	61	697,087	52	588,926	52	588,926
Container 10000	10,000	14,000								
Container 12000	12,000	16,800			11	184,800	26	436,800	26	436,800
Container 14000	14,000	19,600			26	509,600	52	1,019,200	52	1,019,200
Total - Container OGVs			**99**	**827,860**	**178**	**1,875,800**	**190**	**2,389,000**	**190**	**2,389,000**
General Cargo			7		7		7		7	
Total - All OGVs			**106**		**185**		**197**		**197**	

Notes:

1. 2015 calls are based on actual calls by vessel size.
2. The estimated TEUs/call for 2015 is based on an average utilization rate of 71% to accommodate total 2015 actual TEUs (slightly off from actual TEUs 827,901 vs. 827,860). For the 12K and 14 K vessels, the utilization rate for future years is assumed to be 70% based upon APM Terminal Capacity Analysis (AECOM, March 2014).
3. 2017, 2025 and 2038 TEUs are based on the following EIR projections:

Year	Annual TEU	
2015	1,747,500	
2017	1,875,800	(interpolated)
2025	2,389,000	
2038	2,389,000	

4. In 2017, it is assumed that there will be weekly calls made by 14K vessels starting in mid-2017 (per Scott Axelson). In addition, since the crane raising will be completed in February 2017, it is assumed there will be one 12K vessel call per month in 2017 (starting in Feb 2017). The balance of TEUs in 2017 will be handled by the same mix and proportion of vessels in 2015.
5. In 2025 and 2038, it is assumed that there will be weekly calls for 14K vessels and biweekly calls for 12K vessels with the balance of TEUs handled by 4K and 8K vessels. It is assumed that the few 5K and 6K vessel calls in 2015/2016 will be replaced with 4K and 8K vessels, respectively.
6. General cargo activity is assumed to stay at the 2015 level in future years.

Table A-16. Composite NOx Emission Factors for OGV Tier Fleet Mixes

10-14K TEU Vessels, Year 2038

Main Propulsion Engine (10-14K)*			
	NOx EF (g/kWh)	2038 Mix	Wt Avg (g/kWh)
Tier 1	17	0%	0
Tier 2	15.3	33%	5.0
Tier 3	3.4	67%	2.3
Composite EF			**7.3**

Auxiliary Engine (10-14K)*			
	NOx EF (g/kWh)	2038 Mix	Wt Avg (g/kWh)
Tier 1	13	0%	0
Tier 2	11.2	33%	3.7
Tier 3	3.4	67%	2.3
Composite EF			**6.0**

4-9K TEU Vessels, Year 2038

Main Propulsion Engine (4-9K)*			
	NOx EF (g/kWh)	2038 Mix	Wt Avg (g/kWh)
Tier 1	17	0%	0
Tier 2	15.3	13%	2.0
Tier 3	3.4	87%	3.0
Composite EF			**4.9**

Auxiliary Engine (4-9K)*			
	NOx EF (g/kWh)	2038 Mix	Wt Avg (g/kWh)
Tier 1	13	0%	0
Tier 2	11.2	13%	1.5
Tier 3	3.4	87%	3.0
Composite EF			**4.4**

General Cargo Vessels, Year 2015

Main Engine			
	2015 calls	NOx EF (g/kWh)	Wt Avg (g/kWh)
Tier 0	1	18.1	18.1
Tier 1	6	17	102
	7		120.1
Composite EF			**17.2**

Auxiliary Engine			
	2015 calls	NOx EF (g/kWh)	Wt Avg (g/kWh)
Tier 0	1	14.7	14.7
Tier 1	6	13	78
	7		92.7
Composite EF			**13.2**

* Year 2038 tier mixes are based on POLA CEQA Terminal Level Container Ship Forecast for Tier 3 Engines, Aug 2015.

Table A-17. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 PM10

2017 OGV Emissions - PM10

2017 TEU = 184,800

2017 Calls = 11 12,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0014	0.0014	0.0013	0.0015	0.0016	0.0016	0.0018	0.0021	0.0032	0	0.0315
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0008	0.0062	0.0128
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.000043	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0092	0.0102
2017 PM10 Emissions per Call (tons)	0.0017	0.0017	0.0016	0.0018	0.0019	0.0020	0.0022	0.0026	0.0041	0.0154	0.0546
2017 PM10 Emissions for All Calls (tons)											0.60

Peak Daily*	Tons/day	lb/day
Total	0.022	44
Transit	0.020	39
Hotelling	0.002	5

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - PM10

2017 TEU = 509,600

2017 Calls = 26 14,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0013	0.0013	0.0012	0.0013	0.0014	0.0017	0.0016	0.0022	0.0032	0	0.0306
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0009	0.0061	0.0125
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.000041	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0099	0.0109
2017 PM10 Emissions per Call (tons)	0.0016	0.0016	0.0015	0.0016	0.0018	0.0020	0.0020	0.0026	0.0042	0.0160	0.0540
2017 PM10 Emissions for All Calls (tons)											1.40

Peak Daily*	Tons/day	lb/day
Total	0.021	42
Transit	0.019	38
Hotelling	0.002	4

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - PM10

2017 TEU = 487,961

2017 Calls = 43 8,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

8000 TEU Vessels - Tier 1

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	13.1	10.7	10.7	10.7	10.6	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.458	0.495	0.457	0.515	0.563	0.595	0.619	0.780	1	43.09	
max speed	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3		
load factor	0.104	0.076	0.076	0.075	0.074	0.074	0.078	0.082	0.021		
ME Rating KW	63728	63728	63728	63728	63728	63728	63728	63728	63728	0	
ME KWhr	3037	2388	2203	2446	2640	2790	3071	4085	1350		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0012	0.0012	0.0011	0.0012	0.0013	0.0014	0.0015	0.0018	0.0028	0	0.0272
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	684	740	683	769	841	889	925	1165	2753	38867	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0008	0.0022	0.0075
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	298	322	297	334	366	387	403	507	531	22881	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0034	0.0045
2017 PM10 Emissions per Call (tons)	0.0014	0.0015	0.0013	0.0015	0.0016	0.0017	0.0019	0.0023	0.0036	0.0056	0.0391
2017 PM10 Emissions for All Calls (tons)											1.68

Peak Daily*	Tons/day	lb/day
Total	0.008	16
Transit	0.000	0
Hotelling	0.008	16

* Peak Daily Assumption: 1 Non-AMP hotelling.

Table A-17. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 PM10 (Continued)

2017 OGV Emissions - PM10

2017 TEU = 209,126

2017 Calls = 18 8,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 2, no slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.780	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0011	0.0010	0.0010	0.0011	0.0012	0.0013	0.0013	0.0017	0.0030	0	0.0254
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0008	0.0022	0.0075
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0034	0.0045
2017 PM10 Emissions per Call (tons)	0.0013	0.0013	0.0012	0.0013	0.0014	0.0016	0.0016	0.0021	0.0039	0.0056	0.0374
2017 PM10 Emissions for All Calls (tons)											0.69

2017 OGV Emissions - PM10

2017 TEU = 48,634

2017 Calls = 6 6,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

6000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	11.6	10.9	10.8	10.8	9.7	10.7	10.9	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.484	0.488	0.453	0.535	0.585	0.584	0.611	0.780	1	40.15	
max speed	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5		
load factor	0.097	0.087	0.086	0.073	0.072	0.086	0.089	0.091	0.023		
ME Rating KW	57199	57199	57199	57199	57199	57199	57199	57199	57199	0	
ME KWhr	2683	2427	2218	2239	2416	2863	3120	4038	1334		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0011	0.0011	0.0010	0.0011	0.0012	0.0013	0.0014	0.0017	0.0027	0	0.0253
AE KW	1453	1453	1453	1453	1453	1453	1453	1453	2197	990	
AE KWhr	704	710	658	777	850	849	888	1133	2197	39749	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0006	0.0022	0.0072
AB KW	577	577	577	577	577	577	577	577	573	573	
AB KWhr	280	282	261	308	338	337	353	450	573	23006	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0034	0.0044
2017 PM10 Emissions per Call (tons)	0.0014	0.0013	0.0012	0.0014	0.0015	0.0016	0.0017	0.0021	0.0034	0.0057	0.0369
2017 PM10 Emissions for All Calls (tons)											0.21

2017 OGV Emissions - PM10

2017 TEU = 70,925

2017 Calls = 10 5,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

5000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	12.1	11.4	11.5	11.5	11.6	11.6	11.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.464	0.463	0.425	0.474	0.515	0.551	0.600	0.780	1	51.39	
max speed	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
load factor	0.098	0.091	0.092	0.093	0.094	0.091	0.084	0.080	0.021		
ME Rating KW	51479	51479	51479	51479	51479	51479	51479	51479	51479	0	
ME KWhr	2336	2157	2008	2270	2494	2568	2582	3223	1065		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0010	0.0009	0.0008	0.0009	0.0010	0.0011	0.0012	0.0015	0.0022	0	0.0211
AE KW	1725	1725	1725	1725	1725	1725	1725	1725	3367	900	
AE KWhr	800	798	734	818	888	951	1035	1346	3367	46251	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0004	0.0009	0.0026	0.0086
AB KW	545	545	545	545	545	545	545	545	547	547	
AB KWhr	253	252	232	259	280	300	327	425	547	28110	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0042	0.0051
2017 PM10 Emissions per Call (tons)	0.0012	0.0012	0.0011	0.0012	0.0013	0.0014	0.0015	0.0019	0.0032	0.0068	0.0348
2017 PM10 Emissions for All Calls (tons)											0.35

Table A-17. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 PM10 (Continued)

2017 OGV Emissions - PM10

2017 TEU = 364,755

2017 Calls = 64 4,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0024	0	0.0211
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0007	0.0034	0.0085
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0038	0.0046
2017 PM10 Emissions per Call (tons)	0.0012	0.0012	0.0011	0.0012	0.0013	0.0013	0.0014	0.0018	0.0032	0.0071	0.0342
2017 PM10 Emissions for All Calls (tons)											2.20

2017 OGV Emissions - PM10

2015 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0008	0.0005	0	0.0100
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004	0.0081	0.0102
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008	0.0009
2017 PM10 Emissions per Call (tons)	0.0006	0.0006	0.0005	0.0006	0.0006	0.0006	0.0007	0.0009	0.0009	0.0089	0.0210
2017 PM10 Emissions for All Calls (tons)											0.15

PM10 Annual (tons)
7.28

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.051	102.0
Transit	0.039	77.2
Hotelling	0.012	24.8

* One 14K, one 12K, one 8K assumed

Table A-18. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 NOx

2017 OGV Emissions - NOx

2017 TEU = 184,800
2017 Calls = 11 12,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0666	0.0641	0.0591	0.0663	0.0715	0.0742	0.0809	0.1002	0.1135	0	1.3929
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0109	0.0114	0.0106	0.0118	0.0129	0.0138	0.0144	0.0182	0.0329	0.2549	0.5290
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0014	0.1334	0.1485
2017 NOx Emissions per Call (tons)	0.0782	0.0762	0.0703	0.0788	0.0852	0.0888	0.0962	0.1195	0.1479	0.3883	2.0704
2017 NOx Emissions for All Calls (tons)											22.77

Peak Daily*	Tons/day	lb/day
Total	0.874	1,748
Transit	0.841	1,682
Hotelling	0.033	66.3

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - NOx

2017 TEU = 509,600
2017 Calls = 26 14,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons) Slide Valves
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0655	0.0611	0.0564	0.0632	0.0682	0.0760	0.0771	0.1026	0.1163	0	1.3730
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0102	0.0106	0.0098	0.0110	0.0120	0.0128	0.0134	0.0169	0.0358	0.2519	0.5166
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0006	0.0006	0.0007	0.0007	0.0008	0.0008	0.0010	0.0013	0.1440	0.1583
2017 NOx Emissions per Call (tons)	0.0763	0.0724	0.0668	0.0748	0.0809	0.0896	0.0913	0.1205	0.1534	0.3959	2.0479
2017 NOx Emissions for All Calls (tons)											53.24

Peak Daily*	Tons/day	lb/day
Total	0.857	1,714
Transit	0.826	1,652
Hotelling	0.031	62.5

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - NOx

2017 TEU = 487,961
2017 Calls = 43 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

8000 TEU Vessels - Tier 1

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	13.1	10.7	10.7	10.7	10.6	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.458	0.495	0.457	0.515	0.563	0.595	0.619	0.780	1	43.09	
max speed	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3		
load factor	0.104	0.076	0.076	0.075	0.074	0.074	0.078	0.082	0.021		
ME Rating KW	63728	63728	63728	63728	63728	63728	63728	63728	63728	0	
ME KWhr	3037	2388	2203	2446	2640	2790	3071	4085	1350		
ME EF g/kwhr	17	17	17	17	17	17	17	17	17		
ME Emissions per Call (tons)	0.0652	0.0609	0.0562	0.0624	0.0674	0.0712	0.0784	0.0971	0.1100	0	1.3375
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	684	740	683	769	841	889	925	1165	2753	38867	
AE EF g/kwhr	13	13	13	13	13	13	13	13	13	13	
AE Emissions per Call (tons)	0.0092	0.0100	0.0092	0.0103	0.0113	0.0120	0.0125	0.0157	0.0371	0.1046	0.3590
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	298	322	297	334	366	387	403	507	531	22881	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0012	0.0497	0.0647
2017 NOx Emissions per Call (tons)	0.0751	0.0716	0.0661	0.0735	0.0795	0.0840	0.0917	0.1139	0.1482	0.1544	1.7612
2017 NOx Emissions for All Calls (tons)											75.65

Peak Daily*	Tons/day	lb/day
Total	0.319	638
Transit	0.000	0
Hotelling	0.319	638

* Peak Daily Assumption: 1 Non-AMP hotelling.

Table A-18. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 NOx (Continued)

2017 OGV Emissions - NOx

2017 TEU = 209,126
2017 Calls = 18 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 2, no slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.780	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0574	0.0518	0.0478	0.0535	0.0578	0.0624	0.0654	0.0870	0.1090	0	1.1840
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0081	0.0085	0.0078	0.0088	0.0096	0.0103	0.0107	0.0135	0.0319	0.0901	0.3088
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0007	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0012	0.0497	0.0647
2017 NOx Emissions per Call (tons)	0.0662	0.0610	0.0563	0.0630	0.0682	0.0735	0.0770	0.1016	0.1421	0.1399	1.5575
2017 NOx Emissions for All Calls (tons)											28.67

2017 OGV Emissions - NOx

2017 TEU = 48,634
2017 Calls = 6 6,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

6000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	11.6	10.9	10.8	10.8	9.7	10.7	10.9	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.484	0.488	0.453	0.535	0.585	0.584	0.611	0.780	1	40.15	
max speed	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5		
load factor	0.097	0.087	0.086	0.073	0.072	0.086	0.089	0.091	0.023		
ME Rating KW	57199	57199	57199	57199	57199	57199	57199	57199	57199	0	
ME KWhr	2683	2427	2218	2239	2416	2863	3120	4038	1334		
ME EF g/kwhr	17	17	17	17	17	17	17	17	17		
ME Emissions per Call (tons)	0.0600	0.0577	0.0527	0.0571	0.0616	0.0680	0.0741	0.0903	0.1087	0	1.2604
AE KW	1453	1453	1453	1453	1453	1453	1453	1453	2197	990	
AE KWhr	704	710	658	777	850	849	888	1133	2197	39749	
AE EF g/kwhr	13	13	13	13	13	13	13	13	13	13	
AE Emissions per Call (tons)	0.0095	0.0096	0.0089	0.0105	0.0114	0.0114	0.0119	0.0153	0.0296	0.1070	0.3429
AB KW	577	577	577	577	577	577	577	577	573	573	
AB KWhr	280	282	261	308	338	337	353	450	573	23006	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0006	0.0006	0.0007	0.0007	0.0007	0.0008	0.0010	0.0012	0.0500	0.0638
2017 NOx Emissions per Call (tons)	0.0700	0.0678	0.0621	0.0683	0.0738	0.0802	0.0868	0.1065	0.1395	0.1570	1.6672
2017 NOx Emissions for All Calls (tons)											9.52

2017 OGV Emissions - NOx

2017 TEU = 70,925
2017 Calls = 10 5,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

5000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.1	11.4	11.5	11.5	11.6	11.6	11.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.464	0.463	0.425	0.474	0.515	0.551	0.600	0.780	1	51.39	
max speed	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
load factor	0.098	0.091	0.092	0.093	0.094	0.091	0.084	0.080	0.021		
ME Rating KW	51479	51479	51479	51479	51479	51479	51479	51479	51479	0	
ME KWhr	2336	2157	2008	2270	2494	2568	2582	3223	1065		
ME EF g/kwhr	17	17	17	17	17	17	17	17	17		
ME Emissions per Call (tons)	0.0522	0.0482	0.0449	0.0507	0.0557	0.0574	0.0613	0.0766	0.0868	0	1.0678
AE KW	1725	1725	1725	1725	1725	1725	1725	1725	3367	900	
AE KWhr	800	798	734	818	888	951	1035	1346	3367	46251	
AE EF g/kwhr	13	13	13	13	13	13	13	13	13	13	
AE Emissions per Call (tons)	0.0108	0.0107	0.0099	0.0110	0.0119	0.0128	0.0139	0.0181	0.0453	0.1245	0.4135
AB KW	545	545	545	545	545	545	545	545	547	547	
AB KWhr	253	252	232	259	280	300	327	425	547	28110	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007	0.0007	0.0009	0.0012	0.0611	0.0736
2017 NOx Emissions per Call (tons)	0.0635	0.0595	0.0553	0.0623	0.0683	0.0709	0.0760	0.0956	0.1333	0.1856	1.5548
2017 NOx Emissions for All Calls (tons)											15.53

Table A-18. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 NOx (Continued)

2017 OGV Emissions - NOx

2017 TEU = 364,755

2017 Calls = 64 4,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	17	17	17	17	17	17	17	17	17		
ME Emissions per Call (tons)	0.0498	0.0478	0.0441	0.0480	0.0513	0.0553	0.0590	0.0775	0.0972	0	1.0599
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	13	13	13	13	13	13	13	13	13	13	
AE Emissions per Call (tons)	0.0097	0.0098	0.0090	0.0103	0.0113	0.0118	0.0121	0.0151	0.0340	0.1606	0.4067
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007	0.0007	0.0008	0.0011	0.0550	0.0670
2017 NOx Emissions per Call (tons)	0.0601	0.0581	0.0536	0.0589	0.0632	0.0678	0.0717	0.0934	0.1322	0.2156	1.5336
2017 NOx Emissions for All Calls (tons)											98.48

2017 OGV Emissions - NOx

2017 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2	17.2		
ME Emissions per Call (tons)	0.0359	0.0331	0.0297	0.0310	0.0331	0.0347	0.0382	0.0508	0.0243	0	0.6218
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	13.2	
AE Emissions per Call (tons)	0.0033	0.0033	0.0031	0.0036	0.0040	0.0042	0.0044	0.0055	0.0197	0.3923	0.4943
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0118	0.0124
2017 NOx Emissions per Call (tons)	0.0392	0.0364	0.0328	0.0346	0.0371	0.0389	0.0426	0.0563	0.0443	0.4041	1.1285
2017 NOx Emissions for All Calls (tons)											7.90

* Composite EF (See Composite EF tab)

NOx Annual (tons)
311.8

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	2.050	4,101.0
Transit	1.667	3,334.1
Hotelling	0.383	766.9

* One 14K, one 12K, one 8K assumed

Table A-19. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 SOx

2017 OGV Emissions - SOx

2017 TEU = 184,800
2017 Calls = 11 12,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0014	0.0012	0.0011	0.0012	0.0013	0.0014	0.0015	0.0020	0.0007	0	0.0237
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0008	0.0014	0.0110	0.0229
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0412	0.0459
2017 SOx Emissions per Call (tons)	0.0021	0.0019	0.0018	0.0020	0.0021	0.0022	0.0024	0.0031	0.0025	0.0523	0.0925
2017 SOx Emissions for All Calls (tons)											1.02

Peak Daily*	Tons/day	lb/day
Total	0.030	61
Transit	0.020	40
Hotelling	0.010	20

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - SOx

2017 TEU = 509,600
2017 Calls = 26 14,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0015	0.0012	0.0011	0.0013	0.0014	0.0014	0.0015	0.0021	0.0007	0	0.0242
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0004	0.0005	0.0004	0.0005	0.0005	0.0006	0.0006	0.0007	0.0015	0.0109	0.0223
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0445	0.0489
2017 SOx Emissions per Call (tons)	0.0021	0.0019	0.0017	0.0019	0.0021	0.0022	0.0024	0.0031	0.0026	0.0554	0.0955
2017 SOx Emissions for All Calls (tons)											2.48

Peak Daily*	Tons/day	lb/day
Total	0.030	59
Transit	0.020	40
Hotelling	0.010	19

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - SOx

2017 TEU = 487,961
2017 Calls = 43 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

8000 TEU Vessels - Tier 1

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	13.1	10.7	10.7	10.7	10.6	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.458	0.495	0.457	0.515	0.563	0.595	0.619	0.78	1	43.09	
max speed	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3		
load factor	0.104	0.076	0.076	0.075	0.074	0.074	0.078	0.082	0.021		
ME Rating KW	63728	63728	63728	63728	63728	63728	63728	63728	63728	0	
ME KWhr	3037	2388	2203	2446	2640	2790	3071	4085	1350		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0013	0.0010	0.0009	0.0010	0.0011	0.0012	0.0013	0.0017	0.0006	0	0.0205
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	684	740	683	769	841	889	925	1165	2753	38867	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0003	0.0004	0.0003	0.0004	0.0004	0.0004	0.0005	0.0006	0.0014	0.0039	0.0134
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	298	322	297	334	366	387	403	507	531	22881	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0154	0.0200
2017 SOx Emissions per Call (tons)	0.0018	0.0016	0.0015	0.0017	0.0018	0.0019	0.0020	0.0027	0.0023	0.0193	0.0539
2017 SOx Emissions for All Calls (tons)											2.32

Peak Daily*	Tons/day	lb/day
Total	0.019	39
Transit	0.000	0
Hotelling	0.019	39

* Peak Daily Assumption: 1 Non-AMP hotelling.

Table A-19. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 SOx (Continued)

2017 OGV Emissions - SOx

2017 TEU = 209,126
2017 Calls = 18 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 2, no slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0014	0.0011	0.0011	0.0012	0.0013	0.0013	0.0014	0.0019	0.0006	0	0.0227
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0005	0.0006	0.0014	0.0039	0.0133
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0154	0.0200
2017 SOx Emissions per Call (tons)	0.0019	0.0017	0.0016	0.0018	0.0019	0.0020	0.0022	0.0029	0.0024	0.0193	0.0561
2017 SOx Emissions for All Calls (tons)											1.03

2017 OGV Emissions - SOx

2017 TEU = 48,634
2017 Calls = 6 6,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

6000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	11.6	10.9	10.8	10.8	9.7	10.7	10.9	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.484	0.488	0.453	0.535	0.585	0.584	0.611	0.780	1	40.15	
max speed	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5		
load factor	0.097	0.087	0.086	0.073	0.072	0.086	0.089	0.091	0.023		
ME Rating KW	57199	57199	57199	57199	57199	57199	57199	57199	57199	0	
ME KWhr	2683	2427	2218	2239	2416	2863	3120	4038	1334		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions per Call (tons)	0.0011	0.0010	0.0009	0.0010	0.0010	0.0012	0.0013	0.0017	0.0006	0	0.0200
AE KW	1453	1453	1453	1453	1453	1453	1453	1453	2197	990	
AE KWhr	704	710	658	777	850	849	888	1133	2197	39749	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions per Call (tons)	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0004	0.0006	0.0011	0.0040	0.0128
AB KW	577	577	577	577	577	577	577	577	573	573	
AB KWhr	280	282	261	308	338	337	353	450	573	23006	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0155	0.0197
2017 SOx Emissions per Call (tons)	0.0017	0.0016	0.0015	0.0016	0.0017	0.0019	0.0020	0.0026	0.0021	0.0195	0.0525
2017 SOx Emissions for All Calls (tons)											0.30

2017 OGV Emissions - SOx

2017 TEU = 70,925
2017 Calls = 10 5,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

5000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	12.1	11.4	11.5	11.5	11.6	11.6	11.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.464	0.463	0.425	0.474	0.515	0.551	0.600	0.780	1	51.39	
max speed	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
load factor	0.098	0.091	0.092	0.093	0.094	0.091	0.084	0.080	0.021		
ME Rating KW	51479	51479	51479	51479	51479	51479	51479	51479	51479	0	
ME KWhr	2336	2157	2008	2270	2494	2568	2582	3223	1065		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions per Call (tons)	0.0010	0.0009	0.0009	0.0010	0.0011	0.0011	0.0011	0.0014	0.0005	0	0.0177
AE KW	1725	1725	1725	1725	1725	1725	1725	1725	3367	900	
AE KWhr	800	798	734	818	888	951	1035	1346	3367	46251	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions per Call (tons)	0.0004	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0007	0.0017	0.0046	0.0154
AB KW	545	545	545	545	545	545	545	545	547	547	
AB KWhr	253	252	232	259	280	300	327	425	547	28110	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0189	0.0228
2017 SOx Emissions per Call (tons)	0.0016	0.0015	0.0014	0.0016	0.0017	0.0018	0.0018	0.0023	0.0025	0.0235	0.0559
2017 SOx Emissions for All Calls (tons)											0.56

Table A-19. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 SOx (Continued)

2017 OGV Emissions - SOx

2017 TEU = 364,755

2017 Calls = 64 4,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions per Call (tons)	0.0010	0.0009	0.0008	0.0009	0.0009	0.0010	0.0011	0.0015	0.0005	0	0.0172
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions per Call (tons)	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0005	0.0006	0.0013	0.0060	0.0151
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0170	0.0207
2017 SOx Emissions per Call (tons)	0.0015	0.0014	0.0013	0.0014	0.0015	0.0016	0.0018	0.0024	0.0021	0.0230	0.0530
2017 SOx Emissions for All Calls (tons)											3.40

2017 OGV Emissions - SOx

2017 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions per Call (tons)	0.0009	0.0008	0.0007	0.0007	0.0008	0.0008	0.0009	0.0012	0.0004	0	0.0146
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0007	0.0144	0.0181
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0037	0.0038
2017 SOx Emissions per Call (tons)	0.0010	0.0009	0.0008	0.0009	0.0009	0.0010	0.0011	0.0014	0.0012	0.0181	0.0366
2017 SOx Emissions for All Calls (tons)											0.26

SOx Annual (tons)
11.37

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.079	158.9
Transit	0.040	80.3
Hotelling	0.039	78.7

* One 14K, one 12K, one 8K assumed

Table A-20. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 CO

2017 OGV Emissions - CO

2017 TEU = 184,800
2017 Calls = 11 12,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0111	0.0120	0.0111	0.0125	0.0134	0.0139	0.0152	0.0177	0.0232	0	0.2604
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0011	0.0012	0.0011	0.0012	0.0014	0.0014	0.0015	0.0019	0.0034	0.0266	0.0553
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0135	0.0150
2017 CO Emissions per Call (tons)	0.0123	0.0133	0.0123	0.0138	0.0149	0.0155	0.0168	0.0197	0.0267	0.0401	0.3307
2017 CO Emissions for All Calls (tons)											3.64

Peak Daily*	Tons/day	lb/day
Total	0.149	297
Transit	0.145	291
Hotelling	0.003	7

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - CO

2017 TEU = 509,600
2017 Calls = 26 14,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0103	0.0108	0.0100	0.0112	0.0120	0.0143	0.0136	0.0181	0.0237	0	0.2481
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0011	0.0011	0.0010	0.0011	0.0013	0.0013	0.0014	0.0018	0.0037	0.0263	0.0540
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0146	0.0160
2017 CO Emissions per Call (tons)	0.0114	0.0120	0.0110	0.0124	0.0134	0.0157	0.0151	0.0200	0.0276	0.0409	0.3181
2017 CO Emissions for All Calls (tons)											8.27

Peak Daily*	Tons/day	lb/day
Total	0.142	284
Transit	0.139	277
Hotelling	0.003	6

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - CO

2017 TEU = 487,961
2017 Calls = 43 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

8000 TEU Vessels - Tier 1

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	13.1	10.7	10.7	10.7	10.6	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.458	0.495	0.457	0.515	0.563	0.595	0.619	0.78	1	43.09	
max speed	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3		
load factor	0.104	0.076	0.076	0.075	0.074	0.074	0.078	0.082	0.021		
ME Rating KW	63728	63728	63728	63728	63728	63728	63728	63728	63728	0	
ME KWhr	3037	2388	2203	2446	2640	2790	3071	4085	1350		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0092	0.0103	0.0095	0.0106	0.0114	0.0120	0.0133	0.0154	0.0202	0	0.2238
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	684	740	683	769	841	889	925	1165	2753	38867	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0008	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0033	0.0094	0.0323
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	298	322	297	334	366	387	403	507	531	22881	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0050	0.0066
2017 CO Emissions per Call (tons)	0.0101	0.0113	0.0104	0.0116	0.0125	0.0132	0.0145	0.0170	0.0236	0.0145	0.2627
2017 CO Emissions for All Calls (tons)											11.28

Peak Daily*	Tons/day	lb/day
Total	0.029	58
Transit	0.000	0
Hotelling	0.029	58

* Peak Daily Assumption: 1 Non-AMP hotelling.

Table A-20. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 CO (Continued)

2017 OGV Emissions - CO

2017 TEU = 209,126
2017 Calls = 18 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 2, no slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0080	0.0081	0.0075	0.0084	0.0091	0.0104	0.0103	0.0137	0.0222	0	0.1956
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0033	0.0094	0.0323
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0050	0.0066
2017 CO Emissions per Call (tons)	0.0090	0.0091	0.0084	0.0094	0.0102	0.0116	0.0115	0.0152	0.0257	0.0145	0.2344
2017 CO Emissions for All Calls (tons)											4.31

2017 OGV Emissions - CO

2017 TEU = 48,634
2017 Calls = 6 6,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

6000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	11.6	10.9	10.8	10.8	9.7	10.7	10.9	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.484	0.488	0.453	0.535	0.585	0.584	0.611	0.780	1	40.15	
max speed	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5		
load factor	0.097	0.087	0.086	0.073	0.072	0.086	0.089	0.091	0.023		
ME Rating KW	57199	57199	57199	57199	57199	57199	57199	57199	57199	0	
ME KWhr	2683	2427	2218	2239	2416	2863	3120	4038	1334		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions per Call (tons)	0.0090	0.0092	0.0084	0.0097	0.0104	0.0108	0.0118	0.0136	0.0200	0	0.2056
AE KW	1453	1453	1453	1453	1453	1453	1453	1453	2197	990	
AE KWhr	704	710	658	777	850	849	888	1133	2197	39749	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions per Call (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0010	0.0011	0.0014	0.0027	0.0096	0.0309
AB KW	577	577	577	577	577	577	577	577	573	573	
AB KWhr	280	282	261	308	338	337	353	450	573	23006	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0051	0.0065
2017 CO Emissions per Call (tons)	0.0099	0.0101	0.0092	0.0107	0.0115	0.0119	0.0129	0.0150	0.0227	0.0147	0.2429
2017 CO Emissions for All Calls (tons)											1.39

2017 OGV Emissions - CO

2017 TEU = 70,925
2017 Calls = 10 5,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

5000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	12.1	11.4	11.5	11.5	11.6	11.6	11.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.464	0.463	0.425	0.474	0.515	0.551	0.600	0.780	1	51.39	
max speed	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
load factor	0.098	0.091	0.092	0.093	0.094	0.091	0.084	0.080	0.021		
ME Rating KW	51479	51479	51479	51479	51479	51479	51479	51479	51479	0	
ME KWhr	2336	2157	2008	2270	2494	2568	2582	3223	1065		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions per Call (tons)	0.0079	0.0073	0.0067	0.0076	0.0084	0.0086	0.0098	0.0122	0.0159	0	0.1687
AE KW	1725	1725	1725	1725	1725	1725	1725	1725	3367	900	
AE KWhr	800	798	734	818	888	951	1035	1346	3367	46251	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions per Call (tons)	0.0010	0.0010	0.0009	0.0010	0.0011	0.0012	0.0013	0.0016	0.0041	0.0112	0.0372
AB KW	545	545	545	545	545	545	545	545	547	547	
AB KWhr	253	252	232	259	280	300	327	425	547	28110	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0062	0.0075
2017 CO Emissions per Call (tons)	0.0089	0.0083	0.0077	0.0087	0.0095	0.0099	0.0111	0.0139	0.0201	0.0174	0.2134
2017 CO Emissions for All Calls (tons)											2.13

Table A-20. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 CO (Continued)

2017 OGV Emissions - CO

2017 TEU = 364,755

2017 Calls = 64 4,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions per Call (tons)	0.0075	0.0076	0.0070	0.0076	0.0082	0.0088	0.0089	0.0110	0.0178	0	0.1687
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions per Call (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0031	0.0145	0.0366
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0056	0.0068
2017 CO Emissions per Call (tons)	0.0084	0.0085	0.0079	0.0086	0.0092	0.0099	0.0100	0.0124	0.0210	0.0200	0.2121
2017 CO Emissions for All Calls (tons)											13.62

2015 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions per Call (tons)	0.0031	0.0029	0.0026	0.0027	0.0029	0.0030	0.0033	0.0044	0.0041	0	0.0578
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0017	0.0348	0.0438
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012	0.0013
2017 CO Emissions per Call (tons)	0.0034	0.0032	0.0028	0.0030	0.0032	0.0034	0.0037	0.0049	0.0058	0.0360	0.1028
2017 CO Emissions for All Calls (tons)											0.72

CO Annual (tons)
45.37

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.319	638.9
Transit	0.284	567.7
Hotelling	0.036	71.1

* One 14K, one 12K, one 8K assumed

Table A-21. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 VOC

2017 OGV Emissions - VOC

2017 TEU = 184,800
2017 Calls = 11 12,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0055	0.0065	0.0060	0.0067	0.0072	0.0075	0.0082	0.0091	0.0217	0	0.1569
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0007	0.0013	0.0097	0.0201
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0068	0.0075
2017 VOC Emissions per Call (tons)	0.0060	0.0070	0.0064	0.0072	0.0078	0.0081	0.0088	0.0099	0.0230	0.0164	0.1845
2017 VOC Emissions for All Calls (tons)											2.03

Peak Daily*	Tons/day	lb/day
Total	0.086	171
Transit	0.084	168
Hotelling	0.002	3

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - VOC

2017 TEU = 509,600
2017 Calls = 26 14,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0049	0.0056	0.0051	0.0058	0.0062	0.0077	0.0070	0.0094	0.0222	0	0.1477
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0006	0.0014	0.0096	0.0196
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0073	0.0080
2017 VOC Emissions per Call (tons)	0.0053	0.0060	0.0055	0.0062	0.0067	0.0082	0.0076	0.0100	0.0236	0.0169	0.1754
2017 VOC Emissions for All Calls (tons)											4.56

Peak Daily*	Tons/day	lb/day
Total	0.081	162
Transit	0.079	158
Hotelling	0.002	3

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2017 OGV Emissions - VOC

2017 TEU = 487,961
2017 Calls = 43 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

8000 TEU Vessels - Tier 1

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	13.1	10.7	10.7	10.7	10.6	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.458	0.495	0.457	0.515	0.563	0.595	0.619	0.78	1	43.09	
max speed	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3		
load factor	0.104	0.076	0.076	0.075	0.074	0.074	0.078	0.082	0.021		
ME Rating KW	63728	63728	63728	63728	63728	63728	63728	63728	63728	0	
ME KWhr	3037	2388	2203	2446	2640	2790	3071	4085	1350		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0044	0.0056	0.0051	0.0057	0.0061	0.0065	0.0071	0.0080	0.0189	0	0.1347
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	684	740	683	769	841	889	925	1165	2753	38867	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0012	0.0034	0.0118
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	298	322	297	334	366	387	403	507	531	22881	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0025	0.0033
2017 VOC Emissions per Call (tons)	0.0047	0.0059	0.0055	0.0061	0.0066	0.0069	0.0076	0.0085	0.0202	0.0059	0.1498
2017 VOC Emissions for All Calls (tons)											6.43

Peak Daily*	Tons/day	lb/day
Total	0.011	22
Transit	0.000	0
Hotelling	0.011	22

* Peak Daily Assumption: 1 Non-AMP hotelling.

Table A-21. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 VOC (Continued)

2017 OGV Emissions - VOC

2017 TEU = 209,126
2017 Calls = 18 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 2, no slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0037	0.0039	0.0036	0.0040	0.0043	0.0052	0.0049	0.0065	0.0208	0	0.1135
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0012	0.0034	0.0117
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0025	0.0033
2017 VOC Emissions per Call (tons)	0.0040	0.0042	0.0039	0.0044	0.0047	0.0056	0.0053	0.0071	0.0221	0.0059	0.1285
2017 VOC Emissions for All Calls (tons)											2.37

2017 OGV Emissions - VOC

2017 TEU = 48,634
2017 Calls = 6 6,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

6000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	11.6	10.9	10.8	10.8	9.7	10.7	10.9	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.484	0.488	0.453	0.535	0.585	0.584	0.611	0.780	1	40.15	
max speed	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5		
load factor	0.097	0.087	0.086	0.073	0.072	0.086	0.089	0.091	0.023		
ME Rating KW	57199	57199	57199	57199	57199	57199	57199	57199	57199	0	
ME KWhr	2683	2427	2218	2239	2416	2863	3120	4038	1334		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions per Call (tons)	0.0045	0.0047	0.0043	0.0052	0.0056	0.0056	0.0061	0.0067	0.0187	0	0.1228
AE KW	1453	1453	1453	1453	1453	1453	1453	1453	2197	990	
AE KWhr	704	710	658	777	850	849	888	1133	2197	39749	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0010	0.0035	0.0112
AB KW	577	577	577	577	577	577	577	577	573	573	
AB KWhr	280	282	261	308	338	337	353	450	573	23006	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0025	0.0032
2017 VOC Emissions per Call (tons)	0.0048	0.0051	0.0046	0.0056	0.0060	0.0060	0.0065	0.0073	0.0197	0.0060	0.1373
2017 VOC Emissions for All Calls (tons)											0.78

2017 OGV Emissions - VOC

2017 TEU = 70,925
2017 Calls = 10 5,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

5000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	12.1	11.4	11.5	11.5	11.6	11.6	11.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.464	0.463	0.425	0.474	0.515	0.551	0.600	0.780	1	51.39	
max speed	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
load factor	0.098	0.091	0.092	0.093	0.094	0.091	0.084	0.080	0.021		
ME Rating KW	51479	51479	51479	51479	51479	51479	51479	51479	51479	0	
ME KWhr	2336	2157	2008	2270	2494	2568	2582	3223	1065		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions per Call (tons)	0.0039	0.0036	0.0033	0.0038	0.0042	0.0043	0.0050	0.0063	0.0149	0	0.0985
AE KW	1725	1725	1725	1725	1725	1725	1725	1725	3367	900	
AE KWhr	800	798	734	818	888	951	1035	1346	3367	46251	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions per Call (tons)	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0005	0.0006	0.0015	0.0041	0.0135
AB KW	545	545	545	545	545	545	545	545	547	547	
AB KWhr	253	252	232	259	280	300	327	425	547	28110	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0031	0.0037
2017 VOC Emissions per Call (tons)	0.0043	0.0040	0.0037	0.0042	0.0046	0.0047	0.0055	0.0069	0.0164	0.0072	0.1158
2017 VOC Emissions for All Calls (tons)											1.16

Table A-21. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 VOC (Continued)

2017 OGV Emissions - VOC

2017 TEU = 364,755

2017 Calls = 64 4,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

4000 TEU Vessels	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions per Call (tons)	0.0037	0.0039	0.0036	0.0039	0.0042	0.0045	0.0044	0.0052	0.0167	0	0.1004
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0011	0.0053	0.0133
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0028	0.0034
2017 VOC Emissions per Call (tons)	0.0041	0.0043	0.0039	0.0043	0.0046	0.0050	0.0048	0.0057	0.0179	0.0080	0.1171
2017 VOC Emissions for All Calls (tons)											7.52

2017 OGV Emissions - VOC

2015 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions per Call (tons)	0.0013	0.0012	0.0011	0.0011	0.0012	0.0013	0.0014	0.0019	0.0022	0	0.0257
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0006	0.0126	0.0159
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0006
2017 VOC Emissions per Call (tons)	0.0014	0.0013	0.0012	0.0013	0.0014	0.0014	0.0016	0.0021	0.0028	0.0132	0.0422
2017 VOC Emissions for All Calls (tons)											0.30

VOC Annual (tons)
25.15

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.177	355.0
Transit	0.163	326.6
Hotelling	0.014	28.4

* One 14K, one 12K, one 8K assumed

Table A-22. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 GHG

2017 OGV Emissions - GHG

2017 TEU = 184,800

2017 Calls = 11 12,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	2.147	1.810	1.670	1.872	2.020	2.096	2.285	3.040	1.004	0	35.889
ME N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031		
ME N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
ME CH4 EF g/kwhr	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012		
ME CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.713	0.745	0.687	0.770	0.843	0.900	0.941	1.184	2.145	66.5178	84.377
AE N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	
AE N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0010	0.002
AE CH4 EF g/kwhr	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	
AE CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0015	0.002
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.303	0.316	0.292	0.327	0.358	0.382	0.399	0.503	0.644	62.253	69.301
AB N2O EF g/kwhr	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	
AB N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.006
AB CH4 EF g/kwhr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
AB CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2017 GHG Emissions per Call (metric tons)	3.164	2.872	2.649	2.969	3.221	3.377	3.625	4.727	3.794	118.5	174.9
2017 GHG Emissions for All Calls (metric tons)										1303	1923

2017 OGV Emissions - GHG

2017 TEU = 509,600

2017 Calls = 26 14,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	2.199	1.854	1.711	1.917	2.069	2.146	2.340	3.114	1.029	0	36.757
ME N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031		
ME N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
ME CH4 EF g/kwhr	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012		
ME CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.662	0.691	0.638	0.715	0.782	0.835	0.873	1.099	2.330	65.7181	82.968
AE N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	
AE N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0010	0.002
AE CH4 EF g/kwhr	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	
AE CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.0014	0.002
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.286	0.298	0.275	0.308	0.338	0.360	0.377	0.474	0.608	67.234	73.882
AB N2O EF g/kwhr	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	
AB N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.006
AB CH4 EF g/kwhr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
AB CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2017 GHG Emissions per Call (metric tons)	3.147	2.844	2.624	2.940	3.189	3.341	3.589	4.687	3.967	122.4	178.6
2017 GHG Emissions for All Calls (metric tons)										3182	4643

Table A-22. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 GHG (Continued)

2017 OGV Emissions - GHG

2017 TEU = 487,961
2017 Calls = 43 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

8000 TEU Vessels - Tier 1

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	13.1	10.7	10.7	10.7	10.6	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.458	0.495	0.457	0.515	0.563	0.595	0.619	0.78	1	43.09	
max speed	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3	25.3		
load factor	0.104	0.076	0.076	0.075	0.074	0.074	0.078	0.082	0.021		
ME Rating KW	63728	63728	63728	63728	63728	63728	63728	63728	63728	0	
ME KWhr	3037	2388	2203	2446	2640	2790	3071	4085	1350		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.9701	1.5490	1.4291	1.5866	1.7123	1.8098	1.9919	2.6502	0.8756	0	31.149
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002		0.002
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0004		0.003
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	684	740	683	769	841	889	925	1165	2753	38867	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.5169	0.5590	0.5158	0.5807	0.6356	0.6718	0.6991	0.8803	2.0796	23.5181	37.796
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.001
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	298	322	297	334	366	387	403	507	531	22881	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.3021	0.3267	0.3015	0.3394	0.3715	0.3927	0.4086	0.5145	0.5389	23.2210	30.213
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0019	0.002
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.000
2017 GHG Emissions per Call (metric tons)	2.7891	2.4347	2.2464	2.5068	2.7195	2.8743	3.0996	4.0450	3.4941	43.0	91.6
2017 GHG Emissions for All Calls (metric tons)										1847.98	3935.44

2017 OGV Emissions - GHG

2017 TEU = 209,126
2017 Calls = 18 8,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 2, no slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	2.0619	1.7381	1.6037	1.7972	1.9398	2.0123	2.1940	2.9190	0.9644	0	34.461
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002		0.002
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004		0.002
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.5302	0.5538	0.5110	0.5726	0.6267	0.6687	0.6991	0.8803	2.0796	23.5181	37.762
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.001
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.3099	0.3237	0.2987	0.3347	0.3663	0.3908	0.4086	0.5145	0.5389	23.2210	30.194
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0019	0.002
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.000
2017 GHG Emissions per Call (metric tons)	2.9021	2.6157	2.4133	2.7045	2.9329	3.0718	3.3017	4.3138	3.5829	43.0	94.6
2017 GHG Emissions for All Calls (metric tons)										791.99	1740.65

Table A-22. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 GHG (Continued)

2017 OGV Emissions - GHG

2017 TEU = 48,634
2017 Calls = 6 6,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

6000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	11.6	10.9	10.8	10.8	9.7	10.7	10.9	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.484	0.488	0.453	0.535	0.585	0.584	0.611	0.780	1	40.15	
max speed	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5	24.5		
load factor	0.097	0.087	0.086	0.073	0.072	0.086	0.089	0.091	0.023		
ME Rating KW	57199	57199	57199	57199	57199	57199	57199	57199	57199	0	
ME KWhr	2683	2427	2218	2239	2416	2863	3120	4038	1334		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.7403	1.5742	1.4391	1.4526	1.5671	1.8569	2.0238	2.6193	0.8654	0	30.277
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002		0.002
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004		0.002
AE KW	1453	1453	1453	1453	1453	1453	1453	1453	2197	990	
AE KWhr	704	710	658	777	850	849	888	1133	2197	39749	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.5317	0.5362	0.4970	0.5868	0.6424	0.6413	0.6706	0.8561	1.6596	24.0513	37.295
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.001
AB KW	577	577	577	577	577	577	577	577	573	573	
AB KWhr	280	282	261	308	338	337	353	450	573	23006	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.2837	0.2860	0.2651	0.3131	0.3427	0.3421	0.3578	0.4568	0.5815	23.3480	29.806
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0019	0.002
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.000
2017 GHG Emissions per Call (metric tons)	2.5557	2.3964	2.2012	2.3525	2.5522	2.8403	3.0522	3.9322	3.1065	43.6	89.9
2017 GHG Emissions for All Calls (metric tons)										249.03	513.41

2017 OGV Emissions - GHG

2017 TEU = 70,925
2017 Calls = 10 5,000 TEU vessels
Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

5000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	12.1	11.4	11.5	11.5	11.6	11.6	11.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.464	0.463	0.425	0.474	0.515	0.551	0.600	0.780	1	51.39	
max speed	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5		
load factor	0.098	0.091	0.092	0.093	0.094	0.091	0.084	0.080	0.021		
ME Rating KW	51479	51479	51479	51479	51479	51479	51479	51479	51479	0	
ME KWhr	2336	2157	2008	2270	2494	2568	2582	3223	1065		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.5153	1.3993	1.3024	1.4723	1.6178	1.6660	1.6750	2.0908	0.6908	0	26.859
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002		0.002
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0009	0.0000		0.003
AE KW	1725	1725	1725	1725	1725	1725	1725	1725	3367	900	
AE KWhr	800	798	734	818	888	951	1035	1346	3367	46251	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.6044	0.6032	0.5541	0.6182	0.6706	0.7181	0.7818	1.0164	2.5434	27.9859	44.206
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.001
AB KW	545	545	545	545	545	545	545	545	547	547	
AB KWhr	253	252	232	259	280	300	327	425	547	28110	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.2565	0.2560	0.2352	0.2624	0.2847	0.3048	0.3319	0.4314	0.5551	28.5283	34.364
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0023	0.003
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.000
2017 GHG Emissions per Call (metric tons)	2.3763	2.2585	2.0917	2.3529	2.5731	2.6889	2.7887	3.5386	3.7893	52.0	97.3
2017 GHG Emissions for All Calls (metric tons)										519.72	972.15

Table A-22. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2017 GHG (Continued)

2017 OGV Emissions - GHG

2017 TEU = 364,755

2017 Calls = 64 4,000 TEU vessels

Mitigations Included: 80% AMP; 2015 average speed; 0.1% S (CARB's regulation); no slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.4467	1.3051	1.2041	1.3109	1.4005	1.5095	1.7110	2.3410	0.7734	0	26.004
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002		0.002
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003		0.002
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.5441	0.5494	0.5069	0.5763	0.6340	0.6636	0.6805	0.8449	1.9081	36.1018	49.918
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0005	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008	0.001
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.2508	0.2532	0.2337	0.2657	0.2922	0.3059	0.3137	0.3895	0.4993	25.6598	31.268
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0021	0.003
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.000
2017 GHG Emissions per Call (metric tons)	2.2416	2.1077	1.9446	2.1529	2.3268	2.4790	2.7051	3.5754	3.1809	56.8	98.8
2017 GHG Emissions for All Calls (metric tons)										3645.08	6346.49

2015 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (metric tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.3073	1.2064	1.0837	1.1289	1.2070	1.2638	1.3910	1.8506	0.6114	0	22.100
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000		0.001
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.001
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.1831	0.1828	0.1709	0.1987	0.2185	0.2320	0.2414	0.3040	1.0870	21.6850	27.322
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.000
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.0653	0.0652	0.0610	0.0709	0.0779	0.0828	0.0861	0.1084	0.1390	5.5281	7.042
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.001
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
2017 GHG Emissions per Call (metric tons)	1.5557	1.4544	1.3156	1.3985	1.5035	1.5786	1.7186	2.2631	1.8375	25.1	52.0
2017 GHG Emissions for All Calls (metric tons)										175.45	364.11

2015 Transit GHG (metric tons)	2015 Hotelling GHG (metric tons)	2015 Total GHG (metric tons)
8,724	11,715	20,439

Table A-23. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 PM10

2025/2038 OGV Emissions - PM10

2025/2038 TEU = 436,800

2025/2038 Calls = 26 12,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0014	0.0014	0.0013	0.0015	0.0016	0.0016	0.0018	0.0021	0.0032	0	0.0315
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0004	0.0008	0.0000	0.0066
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.000043	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0092	0.0102
Total PM10 Emissions per Call (tons)	0.0017	0.0017	0.0016	0.0018	0.0019	0.0020	0.0022	0.0026	0.0041	0.0092	0.0484
Total PM10 Emissions for All Calls (tons)											1.26

Peak Daily*	Tons/day	lb/day
Total	0.022	44
Transit	0.020	39
Hotelling	0.002	5

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/2038 OGV Emissions - PM10

2025/2038 TEU = 1,019,200

2025/2038 Calls = 52 14,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0013	0.0013	0.0012	0.0013	0.0014	0.0017	0.0016	0.0022	0.0032	0	0.0306
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	0.0003	0.0004	0.0009	0.0000	0.0064
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.000041	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0099	0.0109
Total PM10 Emissions per Call (tons)	0.0016	0.0016	0.0015	0.0016	0.0018	0.0020	0.0020	0.0026	0.0042	0.0099	0.0479
Total PM10 Emissions for All Calls (tons)											2.49

Peak Daily*	Tons/day	lb/day
Total	0.021	42
Transit	0.019	38
Hotelling	0.002	4

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/2038 OGV Emissions - PM10

2025/2038 TEU = 588,926

2025/2038 Calls = 52 8,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.780	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0011	0.0010	0.0010	0.0011	0.0012	0.0013	0.0013	0.0017	0.0030	0	0.0254
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0008	0.0000	0.0053
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0001	0.0001	0.0001	0.0034	0.0045
Total PM10 Emissions per Call (tons)	0.0013	0.0013	0.0012	0.0013	0.0014	0.0016	0.0016	0.0021	0.0039	0.0034	0.0352
Total PM10 Emissions for All Calls (tons)											1.82

Peak Daily*	Tons/day	lb/day
Total	0.002	4
Transit	0.000	0
Hotelling	0.002	4

* Peak Daily Assumption: 1 AMP hotelling.

Table A-23. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 PM10 (Continued)

2025/2038 OGV Emissions - PM10

2025/2038 TEU = 344,074

2025/2038 Calls = 61 4,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0024	0	0.0211
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0007	0.0000	0.0051
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0038	0.0046
Total PM10 Emissions per Call (tons)	0.0012	0.0012	0.0011	0.0012	0.0013	0.0013	0.0014	0.0018	0.0032	0.0038	0.0309
Total PM10 Emissions for All Calls (tons)											1.87

2025/2038 OGV Emissions - PM10

2025/2038 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	PM10 (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5		
ME Emissions per Call (tons)	0.0006	0.0005	0.0005	0.0005	0.0005	0.0005	0.0006	0.0008	0.0005	0	0.0100
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	
AE Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0004	0.0081	0.0102
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0008	0.0009
Total PM10 Emissions per Call (tons)	0.0006	0.0006	0.0005	0.0006	0.0006	0.0006	0.0007	0.0009	0.0009	0.0089	0.0210
Total PM10 Emissions for All Calls (tons)											0.15

205/2038 PM10 Annual (tons)
7.59

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.045	89.9
Transit	0.039	77.2
Hotelling	0.006	12.7

* One 14K, one 12K, and one 8K assumed

Table A-24. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 NOx

2025 OGV Emissions - NOx

2025 TEU = 436,800
2025 Calls = 26 12,000 TEU vessels
Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0666	0.0641	0.0591	0.0663	0.0715	0.0742	0.0809	0.1002	0.1135	0	1.3929
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0109	0.0114	0.0106	0.0118	0.0129	0.0138	0.0144	0.0182	0.0329	0.0000	0.2741
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0014	0.1334	0.1485
Total NOx Emissions per Call (tons)	0.0782	0.0762	0.0703	0.0788	0.0852	0.0888	0.0962	0.1195	0.1479	0.1334	1.8155
Total NOx Emissions for All Calls (tons)											47.20

Peak Daily*	Tons/day	lb/day
Total	0.874	1,748
Transit	0.841	1,682
Hotelling	0.033	66.3

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025 OGV Emissions - NOx

2025 TEU = 1,019,200
2025 Calls = 52 14,000 TEU vessels
Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons) Slide Valves
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0655	0.0611	0.0564	0.0632	0.0682	0.0760	0.0771	0.1026	0.1163	0	1.3730
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0102	0.0106	0.0098	0.0110	0.0120	0.0128	0.0134	0.0169	0.0358	0.0000	0.2648
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0006	0.0006	0.0007	0.0007	0.0008	0.0008	0.0010	0.0013	0.1440	0.1583
Total NOx Emissions per Call (tons)	0.0763	0.0724	0.0668	0.0748	0.0809	0.0896	0.0913	0.1205	0.1534	0.1440	1.7960
Total NOx Emissions for All Calls (tons)											93.39

Peak Daily*	Tons/day	lb/day
Total	0.857	1,714
Transit	0.826	1,652
Hotelling	0.031	62.5

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025 OGV Emissions - NOx

2025 TEU = 588,926
2025 Calls = 52 8,000 TEU vessels
Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.780	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0574	0.0518	0.0478	0.0535	0.0578	0.0624	0.0654	0.0870	0.1090	0	1.1840
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0081	0.0085	0.0078	0.0088	0.0096	0.0103	0.0107	0.0135	0.0319	0.0000	0.2186
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0007	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0012	0.0497	0.0647
Total NOx Emissions per Call (tons)	0.0662	0.0610	0.0563	0.0630	0.0682	0.0735	0.0770	0.1016	0.1421	0.0497	1.4673
Total NOx Emissions for All Calls (tons)											76.07

Peak Daily*	Tons/day	lb/day
Total	0.028	55
Transit	0.000	0
Hotelling	0.028	55

* Peak Daily Assumption: 1 AMP hotelling.

Table A-24. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 NOx (Continued)

2025 OGV Emissions - NOx

2025 TEU = 344,074

2025 Calls = 61 4,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3	15.3		
ME Emissions per Call (tons)	0.0449	0.0430	0.0397	0.0432	0.0462	0.0498	0.0531	0.0697	0.0874	0	0.9539
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	
AE Emissions per Call (tons)	0.0084	0.0084	0.0078	0.0088	0.0097	0.0102	0.0104	0.0130	0.0293	0.0000	0.2121
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007	0.0007	0.0008	0.0011	0.0550	0.0670
Total NOx Emissions per Call (tons)	0.0538	0.0520	0.0480	0.0526	0.0565	0.0606	0.0642	0.0835	0.1178	0.0550	1.2329
Total NOx Emissions for All Calls (tons)											74.69

2025 OGV Emissions - NOx

2025 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr	17	17	17	17	17	17	17	17	17		
ME Emissions per Call (tons)	0.0355	0.0327	0.0294	0.0306	0.0327	0.0343	0.0377	0.0502	0.0241	0	0.6145
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr	13	13	13	13	13	13	13	13	13	13	
AE Emissions per Call (tons)	0.0033	0.0033	0.0030	0.0035	0.0039	0.0041	0.0043	0.0054	0.0194	0.3863	0.4868
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0118	0.0124
Total NOx Emissions per Call (tons)	0.0387	0.0360	0.0324	0.0342	0.0366	0.0384	0.0420	0.0556	0.0437	0.3982	1.1137
Total NOx Emissions for All Calls (tons)											7.80

2025 NOx Annual (tons)
299.15

Three Vessels Combined - 2025

Peak Daily*	Tons/day	lb/day
Total	1.759	3,518.3
Transit	1.667	3,334.1
Hotelling	0.092	184.2

* One 14K, one 12K, and one 8K assumed

2038 OGV Emissions - NOx

2038 TEU = 436,800

2038 Calls = 26 12,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 3/2 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr*	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33		
ME Emissions per Call (tons)	0.0319	0.0307	0.0283	0.0317	0.0343	0.0355	0.0388	0.0480	0.0544	0	0.6673
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr*	6	6	6	6	6	6	6	6	6	6	
AE Emissions per Call (tons)	0.0059	0.0061	0.0057	0.0063	0.0069	0.0074	0.0077	0.0097	0.0176	0.0000	0.1468
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0014	0.1334	0.1485
Total NOx Emissions per Call (tons)	0.0384	0.0375	0.0346	0.0388	0.0420	0.0438	0.0473	0.0588	0.0734	0.1334	0.9626
Total NOx Emissions for All Calls (tons)											25.03
* Composite EF (See Composite EF tab)											

Peak Daily*	Tons/day	lb/day
Total	0.237	474
Transit	0.204	408
Hotelling	0.033	66

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling. Tier 3 vessel

Table A-24. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 NOx (Continued)

2038 OGV Emissions - NOx

2038 TEU = 1,019,200
2038 Calls = 52 14,000 TEU vessels
Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 3/2 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons) Slide Valves
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr*	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33	7.33		
ME Emissions per Call (tons)	0.0314	0.0293	0.0270	0.0303	0.0327	0.0364	0.0370	0.0492	0.0557	0	0.6578
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr*	6	6	6	6	6	6	6	6	6	6	
AE Emissions per Call (tons)	0.0054	0.0057	0.0052	0.0059	0.0064	0.0069	0.0072	0.0090	0.0192	0.0000	0.1418
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0006	0.0006	0.0006	0.0007	0.0007	0.0008	0.0008	0.0010	0.0013	0.1440	0.1583
Total NOx Emissions per Call (tons)	0.0374	0.0356	0.0328	0.0368	0.0398	0.0440	0.0449	0.0592	0.0762	0.1440	0.9579
Total NOx Emissions for All Calls (tons)											49.81

* Composite EF (See Composite EF tab)

Peak Daily*	Tons/day	lb/day
Total	0.231	462
Transit	0.200	400
Hotelling	0.031	63

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling. Tier 3 vessel

2038 OGV Emissions - NOx

2038 TEU = 588,926
2038 Calls = 52 8,000 TEU vessels
Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 3/2 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.780	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr*	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95		
ME Emissions per Call (tons)	0.0186	0.0168	0.0155	0.0173	0.0187	0.0202	0.0211	0.0281	0.0353	0	0.3831
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr*	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
AE Emissions per Call (tons)	0.0032	0.0033	0.0031	0.0035	0.0038	0.0040	0.0042	0.0053	0.0125	0.0000	0.0859
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0007	0.0007	0.0006	0.0007	0.0008	0.0008	0.0009	0.0011	0.0012	0.0497	0.0647
Total NOx Emissions per Call (tons)	0.0224	0.0208	0.0192	0.0215	0.0233	0.0251	0.0262	0.0345	0.0490	0.0497	0.5336
Total NOx Emissions for All Calls (tons)											27.66

* Composite EF (See Composite EF tab)

Peak Daily*	Tons/day	lb/day
Total	0.028	55
Transit	0.000	0
Hotelling	0.028	55

* Peak Daily Assumption: 1 AMP hotelling. Tier 2 vessel

2038 OGV Emissions - NOx

2038 TEU = 344,074
2038 Calls = 61 4,000 TEU vessels
Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 3/2 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr*	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95		
ME Emissions per Call (tons)	0.0145	0.0139	0.0128	0.0140	0.0149	0.0161	0.0172	0.0226	0.0283	0	0.3086
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	
AE Emissions per Call (tons)	0.0033	0.0033	0.0031	0.0035	0.0038	0.0040	0.0041	0.0051	0.0115	0.0000	0.0833
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr*	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0005	0.0005	0.0005	0.0006	0.0006	0.0007	0.0007	0.0008	0.0011	0.0550	0.0670
Total NOx Emissions per Call (tons)	0.0183	0.0178	0.0164	0.0180	0.0194	0.0208	0.0219	0.0285	0.0409	0.0550	0.4589
Total NOx Emissions for All Calls (tons)											27.80

* Composite EF (See Composite EF tab)

Table A-24. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 NOx (Continued)

2038 OGV Emissions - NOx

2038 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	NOx (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr	17	17	17	17	17	17	17	17	17		
ME Emissions per Call (tons)	0.0355	0.0327	0.0294	0.0306	0.0327	0.0343	0.0377	0.0502	0.0241	0	0.6145
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr	13	13	13	13	13	13	13	13	13	13	
AE Emissions per Call (tons)	0.0033	0.0033	0.0030	0.0035	0.0039	0.0041	0.0043	0.0054	0.0194	0.3863	0.4868
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.0118	0.0124
Total NOx Emissions per Call (tons)	0.0387	0.0360	0.0324	0.0342	0.0366	0.0384	0.0420	0.0556	0.0437	0.3982	1.1137
Total NOx Emissions for All Calls (tons)											7.80

2038 NOx Annual (tons)
138.10

Three Vessels Combined - 2038

Peak Daily*	Tons/day	lb/day
Total	0.496	991.8
Transit	0.404	807.6
Hotelling	0.092	184.2

* One 14K, one 12K, and one 8K assumed

Table A-25. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 SOx

2025/2038 OGV Emissions - SOx

2025/2038 TEU = 436,800

2025/2038 Calls = 26 12,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0014	0.0012	0.0011	0.0012	0.0013	0.0014	0.0015	0.0020	0.0007	0	0.0237
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0005	0.0005	0.0005	0.0005	0.0006	0.0006	0.0006	0.0008	0.0014	0.0000	0.0118
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0412	0.0459
Total SOx Emissions per Call (tons)	0.0021	0.0019	0.0018	0.0020	0.0021	0.0022	0.0024	0.0031	0.0025	0.0412	0.0814
Total SOx Emissions for All Calls (tons)											2.12

Peak Daily*	Tons/day	lb/day
Total	0.030	61
Transit	0.020	40
Hotelling	0.010	20

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/2038 OGV Emissions - SOx

2025/2038 TEU = 1,019,200

2025/2038 Calls = 52 14,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0015	0.0012	0.0011	0.0013	0.0014	0.0014	0.0015	0.0021	0.0007	0	0.0242
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0004	0.0005	0.0004	0.0005	0.0005	0.0006	0.0006	0.0007	0.0015	0.0000	0.0114
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0004	0.0445	0.0489
Total SOx Emissions per Call (tons)	0.0021	0.0019	0.0017	0.0019	0.0021	0.0022	0.0024	0.0031	0.0026	0.0445	0.0846
Total SOx Emissions for All Calls (tons)											4.40

Peak Daily*	Tons/day	lb/day
Total	0.030	59
Transit	0.020	40
Hotelling	0.010	19

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/2038 OGV Emissions - SOx

2025/2038 TEU = 588,926

2025/2038 Calls = 52 8,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions (tons)	0.0014	0.0011	0.0011	0.0012	0.0013	0.0013	0.0014	0.0019	0.0006	0	0.0227
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions (tons)	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0005	0.0006	0.0014	0.0000	0.0095
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0003	0.0004	0.0154	0.0200
Total SOx Emissions per Call (tons)	0.0019	0.0017	0.0016	0.0018	0.0019	0.0020	0.0022	0.0029	0.0024	0.0154	0.0522
Total SOx Emissions for All Calls (tons)											2.71

Peak Daily*	Tons/day	lb/day
Total	0.009	17
Transit	0.000	0
Hotelling	0.009	17

* Peak Daily Assumption: 1 AMP hotelling.

Table A-25. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 SOx (Continued)

2025/2038 OGV Emissions - SOx

2025/2038 TEU = 344,074

2025/2038 Calls = 61 4,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions per Call (tons)	0.0010	0.0009	0.0008	0.0009	0.0009	0.0010	0.0011	0.0015	0.0005	0	0.0172
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions per Call (tons)	0.0004	0.0004	0.0003	0.0004	0.0004	0.0004	0.0005	0.0006	0.0013	0.0000	0.0092
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions per Call (tons)	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003	0.0003	0.0170	0.0207
Total SOx Emissions per Call (tons)	0.0015	0.0014	0.0013	0.0014	0.0015	0.0016	0.0018	0.0024	0.0021	0.0170	0.0470
Total SOx Emissions for All Calls (tons)											2.85

2025/2038 OGV Emissions - SOx

2025/2038 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1; no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	SOx (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5	10.5		
ME Emissions per Call (tons)	0.0009	0.0008	0.0007	0.0007	0.0008	0.0008	0.0009	0.0012	0.0004	0	0.0146
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	12.3	
AE Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0002	0.0002	0.0007	0.0144	0.0181
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	16.5	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0037	0.0038
Total SOx Emissions per Call (tons)	0.0010	0.0009	0.0008	0.0009	0.0009	0.0010	0.0011	0.0014	0.0012	0.0181	0.0366
Total SOx Emissions for All Calls (tons)											0.26

2025/2038 SOx Annual (tons)
12.33

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.069	137.2
Transit	0.040	80.3
Hotelling	0.028	57.0

* One 14K, one 12K, and one 8K assumed

Table A-26. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 CO

2025/38 OGV Emissions - CO

2025/2038 TEU = 436,800

2025/2038 Calls = 26 12,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0111	0.0120	0.0111	0.0125	0.0134	0.0139	0.0152	0.0177	0.0232	0	0.2604
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0011	0.0012	0.0011	0.0012	0.0014	0.0014	0.0015	0.0019	0.0034	0.0000	0.0286
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0135	0.0150
Total CO Emissions per Call (tons)	0.0123	0.0133	0.0123	0.0138	0.0149	0.0155	0.0168	0.0197	0.0267	0.0135	0.3041
Total CO Emissions for All Calls (tons)											7.91

Peak Daily*	Tons/day	lb/day
Total	0.149	297
Transit	0.145	291
Hotelling	0.003	7

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/38 OGV Emissions - CO

2025/2038 TEU = 1,019,200

2025/2038 Calls = 52 14,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0103	0.0108	0.0100	0.0112	0.0120	0.0143	0.0136	0.0181	0.0237	0	0.2481
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0011	0.0011	0.0010	0.0011	0.0013	0.0013	0.0014	0.0018	0.0037	0.0000	0.0277
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0146	0.0160
Total CO Emissions per Call (tons)	0.0114	0.0120	0.0110	0.0124	0.0134	0.0157	0.0151	0.0200	0.0276	0.0146	0.2918
Total CO Emissions for All Calls (tons)											15.17

Peak Daily*	Tons/day	lb/day
Total	0.142	284
Transit	0.139	277
Hotelling	0.003	6

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/38 OGV Emissions - CO

2025/2038 TEU = 588,926

2025/2038 Calls = 52 8,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions (tons)	0.0080	0.0081	0.0075	0.0084	0.0091	0.0104	0.0103	0.0137	0.0222	0	0.1956
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0033	0.0000	0.0228
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0050	0.0066
Total CO Emissions per Call (tons)	0.0090	0.0091	0.0084	0.0094	0.0102	0.0116	0.0115	0.0152	0.0257	0.0050	0.2250
Total CO Emissions for All Calls (tons)											11.66

Peak Daily*	Tons/day	lb/day
Total	0.003	6
Transit	0.000	0
Hotelling	0.003	6

* Peak Daily Assumption: 1 AMP hotelling.

Table A-26. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 CO (Continued)

2025/38 OGV Emissions - CO

2025/2038 TEU = 344,074

2025/2038 Calls = 61 4,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions per Call (tons)	0.0075	0.0076	0.0070	0.0076	0.0082	0.0088	0.0089	0.0110	0.0178	0	0.1687
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions per Call (tons)	0.0009	0.0009	0.0008	0.0009	0.0010	0.0011	0.0011	0.0014	0.0031	0.0000	0.0222
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0056	0.0068
Total CO Emissions per Call (tons)	0.0084	0.0085	0.0079	0.0086	0.0092	0.0099	0.0100	0.0124	0.0210	0.0056	0.1976
Total CO Emissions for All Calls (tons)											11.97

2025/38 OGV Emissions - CO

2025/2038 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	CO (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4		
ME Emissions per Call (tons)	0.0031	0.0029	0.0026	0.0027	0.0029	0.0030	0.0033	0.0044	0.0041	0	0.0578
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0017	0.0348	0.0438
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0012	0.0013
Total CO Emissions per Call (tons)	0.0034	0.0032	0.0028	0.0030	0.0032	0.0034	0.0037	0.0049	0.0058	0.0360	0.1028
Total CO Emissions for All Calls (tons)											0.72

2025/2038 CO Annual (tons)
47.43

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.293	586.4
Transit	0.284	567.7
Hotelling	0.009	18.7

* One 14K, one 12K, and one 8K assumed

Table A-27. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 VOC

2025/2038 OGV Emissions - VOC

2025/2038 TEU = 436,800

2025/2038 Calls = 26 12,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0055	0.0065	0.0060	0.0067	0.0072	0.0075	0.0082	0.0091	0.0217	0	0.1569
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0007	0.0013	0.0000	0.0104
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0068	0.0075
Total VOC Emissions per Call (tons)	0.0060	0.0070	0.0064	0.0072	0.0078	0.0081	0.0088	0.0099	0.0230	0.0068	0.1749
Total VOC Emissions for All Calls (tons)											4.55

Peak Daily*	Tons/day	lb/day
Total	0.086	171
Transit	0.084	168
Hotelling	0.002	3

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/2038 OGV Emissions - VOC

2025/2038 TEU = 1,019,200

2025/2038 Calls = 52 14,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0049	0.0056	0.0051	0.0058	0.0062	0.0077	0.0070	0.0094	0.0222	0	0.1477
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0004	0.0004	0.0004	0.0004	0.0005	0.0005	0.0005	0.0006	0.0014	0.0000	0.0101
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0073	0.0080
Total VOC Emissions per Call (tons)	0.0053	0.0060	0.0055	0.0062	0.0067	0.0082	0.0076	0.0100	0.0236	0.0073	0.1658
Total VOC Emissions for All Calls (tons)											8.62

Peak Daily*	Tons/day	lb/day
Total	0.081	162
Transit	0.079	158
Hotelling	0.002	3

* Peak Daily Assumption: 1 arrival or departure, 1 AMP hotelling.

2025/2038 OGV Emissions - VOC

2025/2038 TEU = 588,926

2025/2038 Calls = 52 8,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions (tons)	0.0037	0.0039	0.0036	0.0040	0.0043	0.0052	0.0049	0.0065	0.0208	0	0.1135
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0012	0.0000	0.0083
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001	0.0025	0.0033
Total VOC Emissions per Call (tons)	0.0040	0.0042	0.0039	0.0044	0.0047	0.0056	0.0053	0.0071	0.0221	0.0025	0.1251
Total VOC Emissions for All Calls (tons)											6.48

Peak Daily*	Tons/day	lb/day
Total	0.001	3
Transit	0.000	0
Hotelling	0.001	3

* Peak Daily Assumption: 1 AMP hotelling.

Table A-27. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 VOC (Continued)

2025/2038 OGV Emissions - VOC

2025/2038 TEU = 344,074

2025/2038 Calls = 61 4,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME EF g/kwhr	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions per Call (tons)	0.0037	0.0039	0.0036	0.0039	0.0042	0.0045	0.0044	0.0052	0.0167	0	0.1004
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE EF g/kwhr	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions per Call (tons)	0.0003	0.0003	0.0003	0.0003	0.0004	0.0004	0.0004	0.0005	0.0011	0.0000	0.0081
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0028	0.0034
Total VOC Emissions per Call (tons)	0.0041	0.0043	0.0039	0.0043	0.0046	0.0050	0.0048	0.0057	0.0179	0.0028	0.1119
Total VOC Emissions for All Calls (tons)											6.78

2025/2038 OGV Emissions - VOC

2025/2038 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	VOC (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME EF g/kwhr*	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6		
ME Emissions per Call (tons)	0.0013	0.0012	0.0011	0.0011	0.0012	0.0013	0.0014	0.0019	0.0022	0	0.0257
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE EF g/kwhr*	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
AE Emissions per Call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0006	0.0126	0.0159
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB EF g/kwhr	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
AB Emissions per Call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0006	0.0006
Total VOC Emissions per Call (tons)	0.0014	0.0013	0.0012	0.0013	0.0014	0.0014	0.0016	0.0021	0.0028	0.0132	0.0422
Total VOC Emissions for All Calls (tons)											0.30

2025/2038 VOC Annual (tons)
26.72

Three Vessels Combined

Peak Daily*	Tons/day	lb/day
Total	0.168	335.9
Transit	0.163	326.6
Hotelling	0.005	9.3

* One 14K, one 12K, and one 8K assumed

Table A-28. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 GHG

2025/2038 OGV Emissions - GHG

2025/2038 TEU = 436,800

2025/2038 Calls = 26 12,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

12000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	96.6	
max speed	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2		
load factor	0.098	0.079	0.079	0.079	0.078	0.075	0.079	0.083	0.021		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3310	2791	2575	2885	3114	3231	3522	4686	1548		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	2.147	1.810	1.670	1.872	2.020	2.096	2.285	3.040	1.004	0	35.889
ME N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031		
ME N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
ME CH4 EF g/kwhr	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012		
ME CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
AE KW	2010	2010	2010	2010	2010	2010	2010	2010	2840	1138	
AE KWhr	944	986	910	1020	1116	1191	1245	1568	2840	109931	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.713	0.745	0.687	0.770	0.843	0.900	0.941	1.184	2.145	48.184	66.043
AE N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	
AE N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AE CH4 EF g/kwhr	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	
AE CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002
AB KW	635	635	635	635	635	635	635	635	635	635	
AB KWhr	298	312	288	322	353	376	393	495	635	61341	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.303	0.316	0.292	0.327	0.358	0.382	0.399	0.503	0.644	62.253	69.301
AB N2O EF g/kwhr	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	
AB N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.006
AB CH4 EF g/kwhr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
AB CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total GHG Emissions per Call (tons)	3.164	2.872	2.649	2.969	3.221	3.377	3.625	4.727	3.794	101.7	158.1
Total GHG Emissions for All Calls (metric tons)										2644	4109

2025/2038 OGV Emissions - GHG

2025/2038 TEU = 1,019,200

2025/2038 Calls = 52 14,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2/3 vessels; 0.1% S (CARB's regulation); No slide valves

14000 TEU Vessels

	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	110.6	
max speed	25	25	25	25	25	25	25	25	25		
load factor	0.100	0.081	0.081	0.081	0.080	0.077	0.081	0.085	0.022		
ME Rating KW	72239	72239	72239	72239	72239	72239	72239	72239	72239	0	
ME KWhr	3391	2858	2637	2955	3190	3309	3608	4800	1586		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	2.199	1.854	1.711	1.917	2.069	2.146	2.340	3.114	1.029	0	36.757
ME N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031		
ME N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
ME CH4 EF g/kwhr	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012		
ME CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.003
AE KW	1865	1865	1865	1865	1865	1865	1865	1865	3085	982	
AE KWhr	876	915	844	946	1036	1105	1155	1455	3085	108609	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.662	0.691	0.638	0.715	0.782	0.835	0.873	1.099	2.330	47.605	64.855
AE N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	
AE N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AE CH4 EF g/kwhr	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	
AE CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002
AB KW	599	599	599	599	599	599	599	599	599	599	
AB KWhr	281	294	271	304	333	355	371	467	599	66249	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.286	0.298	0.275	0.308	0.338	0.360	0.377	0.474	0.608	67.234	73.882
AB N2O EF g/kwhr	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	
AB N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.005	0.006
AB CH4 EF g/kwhr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
AB CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total GHG Emissions per Call (tons)	3.147	2.844	2.624	2.940	3.189	3.341	3.589	4.687	3.967	105.8	162.0
Total GHG Emissions for All Calls (metric tons)										5502	8424

Table A-28. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 GHG (Continued)

2025/2038 OGV Emissions - GHG

2025/2038 TEU = 588,926

2025/2038 Calls = 52 8,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

8000 TEU Vessels - Tier 2											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (tons)
speed	12.4	10.8	10.8	10.8	10.8	10.7	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.491	0.453	0.507	0.555	0.592	0.619	0.78	1	43.09	
max speed	23	23	23	23	23	23	23	23	23		
load factor	0.128	0.104	0.104	0.104	0.102	0.099	0.104	0.109	0.028		
ME Rating KW	52737	52737	52737	52737	52737	52737	52737	52737	52737	0	
ME KWhr	3179	2680	2472	2771	2990	3102	3382	4500	1487		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	2.062	1.738	1.604	1.797	1.940	2.012	2.194	2.919	0.964	0	34.461
ME N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031		
ME N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.002
ME CH4 EF g/kwhr	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012		
ME CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.002
AE KW	1494	1494	1494	1494	1494	1494	1494	1494	2753	902	
AE KWhr	702	733	676	758	830	885	925	1165	2753	38867	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.530	0.554	0.511	0.573	0.627	0.669	0.699	0.880	2.080	17.036	31.280
AE N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	
AE N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AE CH4 EF g/kwhr	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	
AE CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
AB KW	650	650	650	650	650	650	650	650	531	531	
AB KWhr	305	319	294	330	361	385	403	507	531	22881	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.310	0.324	0.299	0.335	0.366	0.391	0.409	0.515	0.539	23.221	30.194
AB N2O EF g/kwhr	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	
AB N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.002
AB CH4 EF g/kwhr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
AB CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total GHG Emissions per Call (tons)	2.902	2.616	2.413	2.705	2.933	3.072	3.302	4.314	3.583	37.1	88.6
Total GHG Emissions for All Calls (metric tons)										1922	4594

2025/2038 OGV Emissions - GHG

2025/2038 TEU = 344,074

2025/2038 Calls = 61 4,000 TEU vessels

Mitigations Included: 100% AMP; 2015 average speed for Cont8000; Tier 2 vessels; 0.1% S (CARB's regulation); No slide valves

4000 TEU Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (tons)
speed	11.2	10.5	10.4	10.5	10.1	10.3	10.3	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.502	0.507	0.468	0.532	0.585	0.613	0.628	0.78	1	51.39	
max speed	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7		
load factor	0.096	0.086	0.086	0.082	0.080	0.082	0.091	0.100	0.026		
ME Rating KW	46274	46274	46274	46274	46274	46274	46274	46274	46274	0	
ME KWhr	2230	2012	1856	2021	2159	2327	2638	3609	1192		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.447	1.305	1.204	1.311	1.401	1.509	1.711	2.341	0.773	0	26.004
ME N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031		
ME N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.002
ME CH4 EF g/kwhr	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012		
ME CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.002
AE KW	1434	1434	1434	1434	1434	1434	1434	1434	2526	1161	
AE KWhr	720	727	671	763	839	878	901	1119	2526	59664	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.544	0.549	0.507	0.576	0.634	0.664	0.680	0.845	1.908	26.152	39.967
AE N2O EF g/kwhr	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	0.031	
AE N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001
AE CH4 EF g/kwhr	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	
AE CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.001
AB KW	492	492	492	492	492	492	492	492	492	492	
AB KWhr	247	250	230	262	288	301	309	384	492	25284	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.251	0.253	0.234	0.266	0.292	0.306	0.314	0.389	0.499	25.660	31.268
AB N2O EF g/kwhr	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	0.080	
AB N2O Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.002	0.003
AB CH4 EF g/kwhr	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	
AB CH4 Emissions per call (tons)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total GHG Emissions per Call (tons)	2.242	2.108	1.945	2.153	2.327	2.479	2.705	3.575	3.181	47.6	89.7
Total GHG Emissions for All Calls (metric tons)										2886	5434

Table A-28. OGV Emissions Associated with the Shoreside Crane Raise Improvements - 2025 and 2038 GHG (Continued)

2025/2038 OGV Emissions - GHG

2025/2038 TEU =

2025/2038 Calls = 7 General Cargo

Mitigations Included: No AMP; 2015 average speed; 0.1% S (CARB's regulation); Tier 1/0, no slide valves

General Cargo Vessels											
	Boundary to 40 nm	40 to 35	35 to 30	30 to 25	25 to 20	20 to 15	15 to 10	pz	Manu	Hotelling	GHG Emissions (tons)
speed	12.1	11.1	11.5	10.8	10.7	10.6	10.6	11	7		
distance	5.45	5.3	4.89	5.48	5.97	6.31	6.69	8.58			
time -hrs	0.470	0.469	0.439	0.510	0.561	0.595	0.619	0.78	1	39.76	
max speed	17	17	17	17	17	17	17	17	17		
load factor	0.318	0.294	0.282	0.253	0.246	0.242	0.256	0.271	0.070		
ME Rating KW	13501	13501	13501	13501	13501	13501	13501	13501	13501	0	
ME KWhr	2015	1860	1671	1740	1861	1948	2144	2853	943		
ME CO2 EF g/kwhr	620	620	620	620	620	620	620	620	620		
ME CO2 Emissions per call (tons)	1.3073	1.2064	1.0837	1.1289	1.2070	1.2638	1.3910	1.8506	0.6114	0	22.100
ME N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310		
ME N2O Emissions per call (tons)	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000		0.001
ME CH4 EF g/kwhr	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120	0.0120		
ME CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.001
AE KW	516	516	516	516	516	516	516	516	1439	722	
AE KWhr	242	242	226	263	289	307	320	402	1439	28707	
AE CO2 EF g/kwhr	722	722	722	722	722	722	722	722	722	722	
AE CO2 Emissions per call (tons)	0.1831	0.1828	0.1709	0.1987	0.2185	0.2320	0.2414	0.3040	1.0870	21.6850	27.322
AE N2O EF g/kwhr	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	0.0310	
AE N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0009	0.001
AE CH4 EF g/kwhr	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	0.0080	
AE CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003	0.000
AB KW	137	137	137	137	137	137	137	137	137	137	
AB KWhr	64	64	60	70	77	82	85	107	137	5447	
AB CO2 EF g/kwhr	970	970	970	970	970	970	970	970	970	970	
AB CO2 Emissions per call (tons)	0.0653	0.0652	0.0610	0.0709	0.0779	0.0828	0.0861	0.1084	0.1390	5.5281	7.042
AB N2O EF g/kwhr	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	0.0800	
AB N2O Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0005	0.001
AB CH4 EF g/kwhr	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	0.0020	
AB CH4 Emissions per call (tons)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.000
Total GHG Emissions per Call (tons)	1.5557	1.4544	1.3156	1.3985	1.5035	1.5786	1.7186	2.2631	1.8375	25.1	52.0
Total GHG Emissions for All Calls (metric tons)										175.45	364.11

2025/2038 Transit GHG (metric tons)	2025/2038 Hotelling GHG (metric tons)	2025/2038 GHG (metric tons)
9,796	13,130	22,926

Appendix B: Mitigation Measure Compliance Review

The Final EIR and MMRP contained 52 mitigation measures. Based on an internal audit conducted by the Harbor Department in 2015, TraPac was in compliance with 49 out of the 52 mitigation measures. The TraPac audit and information on compliance status can be found on the Port's website at https://www.portoflosangeles.org/environment/compliance_trapac.asp. As of April 2016, TraPac is now in compliance with 50 out of the 52 mitigation measures. The mitigation measures involve two air quality mitigation measures (AQ-6 and AQ-8) and one transportation mitigation measure (TRANS-3). The following briefly describes the reasons or issues concerning implementation and compliance with these mitigation measures. No changes to these mitigation measures are being recommended as part of this analysis. This mitigation compliance review is included for disclosure purposes only and is limited to air quality and transportation.

AIR QUALITY AND METEOROLOGY

Mitigation Measure AQ-6: Alternative Maritime Power

Mitigation measure AQ-6 as approved in TraPac's permit requires vessels calling at the terminal to use Alternative Maritime Power shore power (AMP) while at berth to reduce emissions. The mitigation is based on the percentage of vessel hours required to plug in which becomes more stringent over time. The following is a brief description of the requirement and how TraPac has complied with the mitigation.

- Commencing January 1, 2011 (the calendar year following the first anniversary of the Permit Effective Date) and thereafter until Permit termination, all vessels calling at the Terminal retrofitted with AMP Equipment shall utilize shore-supplied electrical power, as opposed to bunker or other fuels, exclusively, at all times while berthed at the Terminal, subject to the availability of Port AMP Infrastructure. TraPac has met this requirement as part of its compliance with the California Air Resources Board (CARB) At-Berth Regulation as of January 1, 2010.

- In the calendar year following the Port's written notice to TraPac of completion of Port AMP Infrastructure, not less than 25% of Total Annual Vessel Hours shall be AMP Hours. Notice of completion of Port AMP infrastructure occurred in February 2012 so the requirement applies to calendar year 2013. In 2013, 10% of vessel hours were AMP hours which did not meet the requirement due to terminal construction disruptions and crane raising.

- In the calendar year following the first anniversary of the Port's written notice to TraPac of completion of Port AMP Infrastructure, not less than 50% of Total Annual Vessel Hours shall be AMP Hours. This requirement applies to calendar year 2014. In 2014, 65.6% of vessel hours were AMP hours which exceeded the requirement.

- In the calendar year following the third anniversary of the Port's written notice to TraPac of completion of Port AMP Infrastructure, not less than 60% of Total Annual

Vessel Hours shall be AMP Hours. This requirement would have applied to calendar year 2015 but was superseded by the next requirement below.

- By the end of 2015, not less than 80% of Total Annual Vessel Hours shall be AMP Hours. In 2015, 52.9% of vessel hours were AMP hours which did not meet the requirement due to port congestion that caused charter ships to be deployed without AMP capability. This resulted in a lower than anticipated plug-in rate during this period for TraPac. Based on currently available data from January to April 2016, 88.6% of vessel hours were AMP hours. TraPac is now in compliance with this requirement.

- By the end of 2018 and thereafter until Permit termination, 100% of Total Annual Vessel Hours shall be AMP Hours.

TraPac expects to continue to meet its target of 80% AMP vessel hours in 2016 and 100% at the end of 2018 and thereafter through the use of AMP and the recently approved "bonnet system technology". Through testing and demonstration, TraPac advanced the "bonnet system" which is a ship stack emission capture system that reduces emissions of nitrogen oxides (NOx) and particulate matter less than 2.5 micrometers in size (PM 2.5) and has been verified by CARB as an alternative to AMP for container vessels[3]. The bonnet has been tested on TraPac ships since 2014 and is currently in use. With the prior shortfall in AMP compliance, an emissions analysis was performed for disclosure purposes. Based on the analysis contained in Appendix B of this Addendum, air quality impacts (peak daily and annual) are significantly below what was predicted in the Final EIR.

Mitigation Measures AQ-7 and AQ-8: Cargo Handling Equipment and AQ-17: Periodic Review of New Technology

There are two mitigation measures (MM AQ-7 and AQ-8) which require that all yard tractors and yard equipment meet United States Environmental Protection Agency (USEPA) Tier 4 non-road engine standards by certain timeframes as specified below.

- Mitigation measure AQ-7 Yard Tractors as approved in TraPac's permit required that by December 31, 2010 and thereafter, all yard tractors shall meet at a minimum the USEPA Tier 4 standard.

- Mitigation measure AQ-8 Yard Equipment as approved in TraPac's permit required that by December 31, 2012 and thereafter, all yard equipment (other than yard tractors)

[3] CARB has verified two alternative control technologies using "bonnet" systems for compliance with the airborne toxic control measure for Auxiliary Diesel Engines Operated on Ocean-going Vessels At-Berth in a California Port (At-Berth Regulation). The Executive Order AB-15-01 applies to Clean Air Engineering's Marine Exhaust Treatment System-1. The Executive Order AB-15-02 applies to Advanced Cleanup Technologies' Advanced Marine Emissions Control System.
http://www.arb.ca.gov/ports/shorepower/shorepower.htm

equipped with engines less than 750 horsepower (Hp) shall meet the USEPA Tier 4 non-road engine standards. On December 31, 2014 and thereafter, all yard equipment (including yard tractors) shall, at a minimum, meet the USEPA Tier 4 standards.

As of 2014, TraPac has upgraded its fleet of yard tractors to Tier 4 standards and as such is compliant with mitigation measure AQ-7. Although TraPac has made equipment purchases and upgrades for its yard equipment under mitigation measure AQ-8, there has been delayed implementation in meeting this requirement. Specifically, in 2015 48 out of 78 pieces of yard equipment were Tier 4 compliant (62%). In response through equipment purchase orders, TraPac has committed that their facility will have 100% Tier 4 equipment by the end of 2016 which would only be used on a limited basis as backup or emergency equipment once the terminal is fully electrified in 2018.

Since TraPac has significantly modified the project that was analyzed in the Final EIR to include increased use of electrification, TraPac is also seeking to implement mitigation measure AQ-17: Periodic Review of New Technology. This mitigation measure was designed to provide a process whereby TraPac would consider and implement new air quality technological advancements on a recurring basis (i.e., at least once every seven years) throughout the term of its lease or at the time of a lease amendment or facility modification. Table B-1 below illustrates the compliance status of mitigation measures AQ-7 and AQ-8 and TraPac's plan for incorporating new air quality technological advancements through implementation of mitigation measure AQ-17.

Table B-1. TraPac's Transition of Terminal Cargo Handling Equipment

	Pre-Automation				Phased Automation				
Equipment Type	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Diesel Yard Tractors	80	66	58	57	57	57	57	5	5
			11	11					
Diesel RTGs	10	10	10	10	10	10			
Diesel Top Handlers	6	6	5	5	5	5	4	2	2
Diesel Side Picks	12	11	10	11	11	11	11		
Diesel Forklifts	3	3	3	2	2	2	5	2	2
				3	3	3			
Diesel Manlifts				1	1	1	1	3	3
Electric Automated Stacking Cranes					10	18	29	39	47
Diesel/Hybrid Straddle Carriers					17	28	28	40	40+
Electric Rail Mounted Gantry Cranes							3	3	3

Notes:

1. Green color depicts Tier 4 (or cleaner) compliant equipment per mitigation measures AQ-7 and AQ-8 in compliance with required timelines. Gray color depicts pre-Tier 4 equipment (delayed implementation) due to phasing of new diesel/hybrid and zero emissions equipment.
2. LPG forklifts (8 units) which will be phased out due to automation are not shown in the above table.
3. Equipment inventory information for years 2010-2014 is from the annual Emissions Inventory. For years 2015-2018, equipment data was obtained from TraPac.

Given the delayed implementation of mitigation as it relates to diesel cargo handling equipment, an analysis of past emissions was performed for disclosure purposes. Based on the analysis contained in Appendix B of this Addendum, air quality impacts (peak daily and annual) are significantly below what was predicted in the Final EIR.

Methodology for Mitigation Measure Compliance Review

An air quality study was also performed for information purposes to assess criteria air pollutant and GHG emissions in prior years related to mitigation measure compliance for AMP and CHE. This study is not related to the air quality impact analysis of proposed Project modifications in the Second EIR Addendum. This study focuses on years 2008 to 2014 and compares actual terminal-wide operational emissions to estimated terminal-wide operational emissions from the mitigated proposed project in the Final EIR. Construction emissions were not included in the prior-years comparison because the construction that occurred between 2008 and 2014 was consistent with EIR assumptions and in compliance with all construction mitigation measures. This prior-years analysis also examined the effects of mitigation compliance on modeled criteria pollutant ambient concentration impacts and human health risk impacts predicted in the Final EIR.

The actual terminal-wide operational emissions from 2008 to 2014 take into account the following:

- Emissions from container ships, tugboats, drayage trucks, line haul locomotives, switch locomotives, and CHE associated with actual TraPac terminal operations. The actual equipment usage rates, mitigation compliance levels, and associated emissions were obtained from data used to prepare the annual POLA emission inventory reports for the years 2008 through 2014. The emissions reflect the actual TraPac terminal TEU throughputs shown in Table B-2. Emissions in 2014 include the transition to automated and electrified equipment that was approved in the Second Amendment to Permit No. 881 on September 11, 2013.

The projected terminal-wide operational emissions from 2008 to 2014 for the mitigated proposed project in the Final EIR take into account the following:

- Emissions from container ships, tugboats, drayage trucks, line haul locomotives, switch locomotives, and CHE associated with TraPac terminal operations as projected in the Final EIR. Emissions for years in between 2008 and 2015 were interpolated from the Final EIR's 2008 and 2015 analysis year emissions. The emissions reflect the TraPac terminal TEU throughputs assumed in the Final EIR, as shown in Table B-2. Emissions assume full compliance with all operational mitigation measures in the Final EIR.

Table B-2. Comparison of Actual and EIR-Projected TEU Throughputs at the TraPac Terminal, 2008-2014

Year	Actual (TEU/yr)	EIR (TEU/yr)
2008	762,071	1,173,238
2009	622,512	1,255,275
2010	845,148	1,337,313
2011	659,589	1,419,350
2012	806,034	1,501,388
2013	659,395	1,583,425
2014	654,562	1,665,463

Mitigation Measure Compliance Review

Table B-3 presents the actual criteria pollutant and GHG emissions associated with operation of the TraPac terminal from 2008 to 2014. The emissions account for actual compliance rates with the AMP and CHE mitigation measures prescribed in the Final EIR, as well as the transition to automated and electrified equipment that was approved in the Second Amendment to Permit No. 881 on September 11, 2013 and is being implemented through the periodic technology review lease measure (also identified as Mitigation Measure AQ-17). Construction emissions are not included in the table because the construction that occurred between 2008 and 2014 was consistent with EIR assumptions and in compliance with all construction mitigation measures.

Table B-3. TraPac Terminal Actual Operational Emissions by Major Source Category, 2008-2014

Year	Source Category	Peak Daily Criteria Pollutant Emissions (lb/day)						Annual CO2e (MT/yr)
		PM10	PM2.5	NOx	SOx	CO	VOC	
2008	Ships	346	278	3,368	2,499	368	204	18,091
	Drayage Trucks	150	143	5,033	4	1,343	274	50,652
	Locomotives	13	11	418	3	72	25	5,575
	CHE	14	12	626	2	281	25	4,756
	Tugboats	19	18	444	0	125	32	1,698
	Electrical Consumption	--	--	--	--	--	--	0
	Total	541	463	9,890	2,508	2,189	559	80,771
2009	Ships	220	181	2,993	1,547	323	184	15,387
	Drayage Trucks	5	4	1,034	2	64	18	27,577
	Locomotives	9	9	321	2	56	19	4,178
	CHE	13	12	610	2	278	24	4,871
	Tugboats	17	15	392	0	121	29	1,645
	Electrical Consumption	--	--	--	--	--	--	0
	Total	264	221	5,351	1,554	842	274	53,659
2010	Ships	140	123	3,215	863	365	203	18,206

	Drayage Trucks	18	17	1,835	4	174	45	48,259
	Locomotives	7	7	252	2	46	15	3,339
	CHE	24	22	994	3	492	54	8,213
	Tugboats	12	11	311	0	142	27	1,982
	Electrical Consumption	--	--	--	--	--	--	0
	Total	202	180	6,606	872	1,219	344	79,999
2011	Ships	74	67	2,574	364	326	184	14,370
	Drayage Trucks	11	10	1,301	3	120	32	36,771
	Locomotives	6	5	205	1	39	12	2,803
	CHE	13	12	548	2	357	29	5,733
	Tugboats	8	8	225	0	117	20	1,500
	Electrical Consumption	--	--	--	--	--	--	0
	Total	112	102	4,854	370	959	277	61,177
2012	Ships	66	60	2,597	244	334	179	15,360
	Drayage Trucks	6	6	1,188	3	77	22	34,533
	Locomotives	8	7	219	1	52	12	3,714
	CHE	28	26	1,151	3	581	73	8,533
	Tugboats	8	8	237	0	136	22	1,661
	Electrical Consumption	--	--	--	--	--	--	170
	Total	117	107	5,391	251	1,180	308	63,970
2013	Ships	59	54	2,656	187	305	156	15,424
	Drayage Trucks	4	4	1,014	2	59	17	28,127
	Locomotives	8	7	222	0	53	12	3,714
	CHE	22	20	955	2	479	60	7,052
	Tugboats	5	5	145	0	84	14	1,027
	Electrical Consumption	--	--	--	--	--	--	434
	Total	98	90	4,991	193	980	258	55,777
2014	Ships	37	34	1,959	39	219	117	13,078
	Drayage Trucks	5	4	1,034	2	64	18	27,577
	Locomotives	8	7	228	0	56	12	3,880
	CHE	22	20	1,188	3	602	82	9,392
	Tugboats	7	6	179	0	100	17	1,221
	Electrical Consumption	--	--	--	--	--	--	7,313
	Total	78	72	4,587	44	1,040	247	62,461

Notes:
1. Actual emissions for the TraPac terminal were derived from the POLA annual emission inventory reports and supporting data.
2. Electrical consumption includes AMP and electric ASCs.
3. Construction emissions are not included.

Table B-4 presents the criteria pollutant and GHG emissions associated with operation of the TraPac terminal from 2008 to 2014, as estimated in the Final EIR. The emissions reflect the TraPac terminal TEU throughputs assumed in the Final EIR, as shown in Table B-2 above. Emissions assume full compliance with all operational mitigation measures in the Final EIR. Construction emissions are not included in the table because the construction that occurred between 2008 and 2014 was consistent with EIR assumptions and in compliance with all construction mitigation measures.

Table B-4. TraPac Terminal Operational Emissions Estimated in the Final EIR by Major Source Category, 2008-2014

Year	Source Category	Peak Daily Criteria Pollutant Emissions (lb/day)						Annual CO2e (MT/yr)
		PM10	PM2.5	NOx	SOx	CO	VOC	
2008	Ships	610	571	7,077	4,930	655	279	34,040
	Drayage Trucks	358	329	9,336	9	3,065	956	109,611
	Locomotives	31	29	830	74	139	60	11,145
	CHE	352	324	8,184	5	2,561	702	17,856
	Tugboats	6	6	147	0	24	5	736
	Electrical Consumption	--	--	--	--	--	--	0
	Total	1,357	1,259	25,574	5,017	6,444	2,001	173,386
2009	Ships	538	504	6,578	4,430	656	255	32,666
	Drayage Trucks	313	288	8,362	9	2,771	860	119,464
	Locomotives	32	30	920	63	161	66	12,435
	CHE	305	281	7,077	5	2,610	656	19,390
	Tugboats	6	6	144	0	24	5	743
	Electrical Consumption	--	--	--	--	--	--	1,095
	Total	1,195	1,109	23,081	4,508	6,221	1,842	185,793
2010	Ships	467	437	6,078	3,929	658	231	31,293
	Drayage Trucks	269	248	7,389	10	2,476	764	129,316
	Locomotives	33	31	1,011	53	182	73	13,725
	CHE	258	237	5,969	5	2,658	611	20,925
	Tugboats	6	6	141	0	24	5	750
	Electrical Consumption	--	--	--	--	--	--	2,191
	Total	1,033	958	20,588	3,998	5,998	1,684	198,199
2011	Ships	395	370	5,579	3,429	660	206	29,919
	Drayage Trucks	225	207	6,416	11	2,182	668	139,169
	Locomotives	34	32	1,101	43	204	80	15,015
	CHE	211	194	4,862	5	2,706	566	22,459
	Tugboats	6	5	138	0	24	5	757
	Electrical Consumption	--	--	--	--	--	--	3,286
	Total	871	808	18,096	3,488	5,775	1,525	210,606
2012	Ships	324	303	5,079	2,929	661	182	28,546
	Drayage Trucks	181	166	5,442	12	1,887	572	149,021
	Locomotives	35	33	1,191	32	226	86	16,305
	CHE	163	150	3,755	6	2,754	521	23,993
	Tugboats	6	5	136	0	24	5	765
	Electrical Consumption	--	--	--	--	--	--	4,382
	Total	709	658	15,603	2,979	5,553	1,366	223,012
2013	Ships	252	236	4,580	2,428	663	158	27,172
	Drayage Trucks	137	126	4,469	13	1,593	476	158,874
	Locomotives	36	34	1,281	22	248	93	17,595
	CHE	116	107	2,648	6	2,803	476	25,528
	Tugboats	6	5	133	0	24	5	772

	Electrical Consumption	--	--	--	--	--	--	5,477
	Total	547	507	13,110	2,469	5,330	1,207	235,419
2014	Ships	180	169	4,080	1,928	665	134	25,799
	Drayage Trucks	92	85	3,496	13	1,298	380	168,727
	Locomotives	37	34	1,371	11	269	99	18,885
	CHE	69	63	1,541	6	2,851	431	27,062
	Tugboats	6	5	130	0	24	4	779
	Electrical Consumption	--	--	--	--	--	--	6,573
	Total	385	357	10,618	1,959	5,107	1,049	247,825

Notes:
1. EIR emissions for 2009-2014 are interpolated values based on 2008 and 2015 EIR mitigated proposed project emissions.
2. The following EIR emissions are not included in the table because they are also not included in the actual emissions: railyard cargo handling equipment, locomotives at off-dock rail yards, employee commutes, on-terminal electricity usage other than AMP and electric ASCs, reefer refrigerant losses, and Pier A railyard relocation emissions.
3. To match the assumptions for the actual emissions calculations (Table B-3), the EIR's GHG emissions for ships, trains, and trucks were adjusted to reflect travel to the SCAB boundary instead of the California border.
4. To match the assumptions for the actual emissions calculations, the EIR's drayage truck emissions were adjusted to include only exhaust emissions. Road dust, tire wear, and brake wear emissions were excluded.
5. Electrical consumption includes AMP.
6. Construction emissions are not included.

Table B-5 provides a comparison between the actual emissions (Table B-3) and Final EIR-estimated emissions (Table B-4) associated with TraPac terminal operations from 2008 to 2014. The table shows that, despite the mitigation compliance issues associated with AMP and CHE (AQ-6 and AQ-8), the actual emissions were substantially less than the EIR-estimated emissions for all pollutants and all years (50 to 98 percent lower, depending on the year and pollutant).

The following key factors contributed to the low actual emissions compared to the Final EIR mitigated project emissions:

- The actual container throughputs from 2008 to 2014 were much lower (roughly one-half) than what was assumed in the EIR (see Table B-2).
- The actual sulfur content in the fuel used by container ships was lower than what was assumed in the EIR.
- Some of the container ships that called at the TraPac terminal were low NOx Annex VI-compliant ships, which were not accounted for in the EIR.
- In some years, more container ships implemented vessel speed reduction within 40 nautical miles of Point Fermin than was assumed in the EIR.
- The transition to automated and electrified equipment per the Second Amendment to Permit No. 881 and through TraPac's periodic technology review lease measure (also identified as Mitigation Measure AQ-17) was not accounted for in the EIR.

- The effects of the Port's Clean Truck Program resulted in cleaner trucks than what was assumed in the EIR.

Table B-5. Comparison of Actual to Final EIR TraPac Terminal Operational Emissions, 2008-2014

Year	Scenario	Peak Daily Criteria Pollutant Emissions (lb/day)						Annual CO2e (MT/yr)
		PM10	PM2.5	NOx	SOx	CO	VOC	
2008	Actual Emissions	541	463	9,890	2,508	2,189	559	80,771
	Final EIR Emissions	1,357	1,259	25,574	5,017	6,444	2,001	173,386
	Emissions Impact (Actual minus Final EIR)	-816	-796	-15,684	-2,510	-4,254	-1,442	-92,615
2009	Actual Emissions	264	221	5,351	1,554	842	274	53,659
	Final EIR Emissions	1,195	1,109	23,081	4,508	6,221	1,842	185,793
	Emissions Impact (Actual minus Final EIR)	-931	-888	-17,730	-2,954	-5,379	-1,568	-132,134
2010	Actual Emissions	202	180	6,606	872	1,219	344	79,999
	Final EIR Emissions	1,033	958	20,588	3,998	5,998	1,684	198,199
	Emissions Impact (Actual minus Final EIR)	-831	-779	-13,982	-3,126	-4,779	-1,340	-118,201
2011	Actual Emissions	112	102	4,854	370	959	277	61,177
	Final EIR Emissions	871	808	18,096	3,488	5,775	1,525	210,606
	Emissions Impact (Actual minus Final EIR)	-759	-706	-13,241	-3,118	-4,816	-1,248	-149,429
2012	Actual Emissions	117	107	5,391	251	1,180	308	63,970
	Final EIR Emissions	709	658	15,603	2,979	5,553	1,366	223,012
	Emissions Impact (Actual minus Final EIR)	-592	-551	-10,212	-2,727	-4,373	-1,058	-159,042
2013	Actual Emissions	98	90	4,991	193	980	258	55,777
	Final EIR Emissions	547	507	13,110	2,469	5,330	1,207	235,419
	Emissions Impact (Actual minus Final EIR)	-449	-418	-8,119	-2,276	-4,350	-949	-179,641
2014	Actual Emissions	78	72	4,587	44	1,040	247	62,461
	Final EIR Emissions	385	357	10,618	1,959	5,107	1,049	247,825
	Emissions Impact (Actual minus Final EIR)	-306	-285	-6,030	-1,915	-4,067	-802	-185,364

Notes:
1. Actual emissions for the TraPac terminal were derived from the POLA annual emission inventory reports and supporting data.
2. EIR emissions for 2009-2014 are interpolated values based on 2008 and 2015 EIR mitigated proposed project emissions.
3. Electrical consumption includes AMP and electric ASCs.
4. Construction emissions are not included.

TRANSPORTATION

Mitigation Measure TRANS-3: Alameda Street and Anaheim Street

Mitigation Measure TRANS-3 described below applies to the Harbor Department and is delayed in compliance due to the construction and schedule control of the City's Bureau of Engineering (BOE).

"Provide additional northbound and southbound through-lanes on Alameda Street, and provide a northbound free right-turn lane from northbound Alameda Street to eastbound Anaheim Street
This measure shall be implemented by 2015."

On June 30, 2013, the Harbor Department transferred $8.6 million to BOE to carry out this mitigation measure which was assessed in a Mitigated Negative Declaration (MND) for the Alameda Street Widening between Harry Bridges Boulevard and Anaheim Street Project (City of Los Angeles, July 2, 2015). As analyzed in the MND, the purpose of the transportation project is to implement mitigation measure TRANS-3 along with other adjoining street improvements to improve traffic flow and stormwater runoff conditions. The project is expected to begin construction in April 2018 and would take one year to complete. The Harbor Department is currently working with BOE and the Los Angeles Department of Transportation (LADOT) on implementing the necessary improvements to maintain an acceptable level of service as traffic gradually may increase over time.

Mitigation Measure Compliance Review

An updated level of service traffic analysis was conducted as part of this Second EIR Addendum for disclosure purposes. The results of the analysis indicate the following:

- TraPac's total annual terminal throughput in 2003 (the CEQA baseline year) was 891,976 TEUs. The EIR assumed a throughput of 1,747,500 TEUs for the Project analysis in year 2015. However, the actual total annual terminal throughput for TraPac for calendar year 2015 was 827,829 TEUs, which is considerably less than the 2003 baseline conditions. Therefore, there has been no increase in traffic at the TraPac terminal attributable to the Project at this time, and as such there would be no impact at this intersection as analyzed in the Final EIR.

- The updated LOS analysis for 2015 volumes indicate that the intersection at Alameda Street and Anaheim Street is currently operating at LOS D or better for all peak hours, which is within an acceptable operating level under LADOT guidelines. As stated earlier, there is no increase in traffic attributable to the TraPac project at this time, so the increase in traffic volumes compared to the CEQA baseline is completely attributed to the growth in background traffic. Furthermore, TraPac would not likely reach the projected throughput volume of roughly 1.7 million TEUs until after 2018. Therefore,

delayed implementation of mitigation measure TRANS-3 has not caused and is not projected to cause any new or substantially more severe significant impacts to transportation/circulation beyond those disclosed in the Final EIR.