

APPENDIX E:
GENERAL CONFORMITY DETERMINATION

GENERAL CONFORMITY DETERMINATION 34TH AMERICA'S CUP

Prepared for:
National Park Service and U.S. Coast
Guard

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34TH AMERICA'S CUP

General Conformity Determination

1. Introduction to the Proposed Action

On December 31, 2010, the City of San Francisco was chosen as the location to host the 34th America's Cup (AC34) sailing races. The event sponsors (identified as the AC34 Event Authority LLC and the City of San Francisco) have requested authorization to stage events and construct temporary facilities on lands and waters managed by the Golden Gate National Recreation Area (GGNRA), the San Francisco Maritime National Historical Park (SAFR), (both units of the NPS) and the USCG. In addition, in-water construction and dredging are proposed along the San Francisco waterfront and would be subject to USACE authority. Roads and access managed by the Presidio Trust could also be affected. Authorization for these actions would come in the form of federal agency permits and the development of a Special Local Regulation.

Under the proposed action, the AC34 sailing races would be held in the central San Francisco Bay, within an area bounded by the San Francisco waterfront to the south; the San Francisco-Oakland Bay Bridge, Treasure Island, and Yerba Buena Island to the east; portions of southern Marin County (including Angel Island) to the north; and the Golden Gate Bridge to the west. This represents the maximum area within which actual race courses would be developed and the races themselves conducted. It should be noted the actual race course(s) for the sailing races would occur within smaller portions of this race area and would be determined based on government agency coordination and optimum race conditions in 2012 and 2013. Spectator boat area locations within the race area would also be influenced by those circumstances.

A number of project sites, or venues, would be required to accommodate the AC34 events. Figure 1-1 shows the location of the proposed AC34 venue sites for 2012 and 2013. Several of the venues proposed for AC34 events are areas and facilities managed by the Port of San Francisco (Port), including certain piers (Pier 9, Pier 14, Pier 19, Pier 19½, Pier 23, Piers 27-29½, Pier 26, Pier 28, Piers 30-32, and Pier 80), water basins/water areas (Piers 19-23, Piers 23-27 [Northeast Wharf Open Water Basin], Piers 29-31, Piers 14 North and South (Rincon Point Open Water Basin), Piers 26-28, Piers 28-30, and Piers 32-36 [Brannan Street Wharf Open Water Basin]), and Seawall Lot 330. Other venues proposed for spectator- or sponsor-related activities are under the jurisdiction of other city, state, or federal agencies; these venues include Crissy Field, Marina Green, Fort Mason, Aquatic Park, Alcatraz Island, Fort Baker Pier at Cavallo Point (near Sausalito in Marin County), San Francisco Civic Center, Union Square, and Justin Herman Plaza.

Spectator venues would include federal lands where organized AC34 events would be held. These include Aquatic Park, within the San Francisco Maritime National Historic Park (SAFR); and sites within the Golden Gate National Recreation Area (GGNRA), including: Fort Baker, Alcatraz Island, Crissy Field, and Fort Mason. Secondary viewing areas would be federal lands where organized AC34 events would not be held, but where AC34 spectators could be drawn during the race events. Secondary viewing areas include points within the Presidio and the Marin Headlands.

2. General Conformity Regulatory Background

The EPA promulgated the General Conformity Rule on November 30, 1993 in Volume 58 of the Federal Register (58 FR 63214) to implement the conformity provision of Title I, section 176(c)(1) of the Clean Air Act (CAA). Section 176(c)(1) requires that the Federal government not engage in, support, or provide financial assistance for licensing, permitting, or approving any activity not conforming to an approved CAA implementation plan. The approved implementation plan could be a Federal, State, or Tribal Implementation Plan (i.e., FIP, SIP, or TIP).

The General Conformity Rule is codified in Title 40 of the Code of Federal Regulations (CFR) Part 51, Subpart W and Part 93, Subpart B, “Determining Conformity of General Federal Actions to State or Federal Implementation Plans.” The General Conformity Rule applies to all Federal actions except highway and transit programs. The latter must comply with the conformity requirements for transportation plans in 40 CFR Part 93, Subpart A.

2.1 General Conformity Requirements

Areas of the country that do not meet the NAAQS for any pollutant are designated by the EPA as “nonattainment areas.” Areas that were once designated nonattainment, but are now achieving the NAAQS are termed “maintenance areas.” Areas which have air pollution levels below the NAAQS are termed “attainment areas.” In nonattainment areas, states must develop plans to reduce emissions and bring the area back into attainment of the NAAQS. The General Conformity Rule ensures that the actions taken by federal agencies in nonattainment and maintenance areas do not interfere with a state’s plans to meet national standards for air quality. Established under the Clean Air Act (section 176(c)(4)), the General Conformity Rule plays an important role in helping states improve air quality in those areas that do not meet the NAAQS. Under the General Conformity Rule, federal agencies must work with State and local governments in a nonattainment or maintenance area to ensure that federal actions conform to the air quality plans established in the applicable state implementation plan. The purpose of the General Conformity Rule is to:

- Ensure that federal activities do not cause or contribute to new violation of NAAQS;
- Ensure that actions do not cause additional or worsen existing violations of or contribute to new violations the NAAQS; and
- Ensure that attainment of the NAAQSs is not delayed.

Implementation of the existing General Conformity Regulations falls into three phases: applicability analysis, conformity determination, and review process. Only actions which cause emissions in designated nonattainment and maintenance areas are subject to the regulations. In addition, the regulations recognize that the vast majority of federal actions do not result in a

significant increase in emissions and, therefore, include a number of exemptions the most predominantly implemented of which is the de minimis emission levels based on the type and severity of the nonattainment problem. If the action will cause emissions above the de minimis in any nonattainment or maintenance area and the action is not otherwise exempt, “presumed to conform,” or included in the existing emissions budget of the SIP, the agency must conduct a conformity determination before it takes the action.

When the applicability analysis shows that the action must undergo a conformity determination, federal agencies must first show that the action will meet all SIP control requirements such as reasonably available control measures, and the emissions from the action will not cause a new violation of the standard, or interfere with the timely attainment of the standard, the maintenance of the standard, or the area's ability to achieve an interim emission reduction milestone. Federal agencies then must demonstrate conformity by meeting one or more of the methods specified in the regulation for determining conformity:

1. Demonstrating that the total direct and indirect emissions are specifically identified and accounted for in the applicable SIP,
2. Obtaining a written statement from the state, tribe or local agency responsible for the SIP documenting that the total direct and indirect emissions from the action along with all other emissions in the area will not exceed the SIP emission budget,
3. Obtaining a written commitment from the state or tribe to revise the SIP to include the emissions from the action,
4. Obtaining a statement from the metropolitan planning organization (MPO) for the area documenting that any on-road motor vehicle emissions are included in the current regional emission analysis for the area's transportation plan or transportation improvement program,
5. Fully offsetting the total direct and indirect emissions by reducing emissions of the same pollutant or precursor in the same nonattainment or maintenance area, or
6. Conducting air quality modeling that demonstrates that the emissions will not cause or contribute to new violations of the standards, or increase the frequency or severity of any existing violations of the standards.

As public bodies, federal agencies must make their conformity determinations through a public process. The General Conformity Regulations require federal agencies to provide notice of the draft determination to the applicable EPA Regional Office, the state and local air quality agencies, the local MPO and, where applicable, the Federal Land Manager. In addition, the regulations require federal agencies to provide at least a 30-day comment period on the draft determination and make the final determination public. State agencies and the public can appeal the final determination in the U.S. Courts system. Failure by a federal agency to follow the substantive and procedural General Conformity requirements can result in an adverse court decision if challenged.

2.2 General Conformity Applicability

The proposed AC34 Project would generate marine emissions in Federal waters in San Francisco Bay, an area where the EPA has jurisdiction over air emissions. Additionally emissions would be generated in lands of the National Park Service and Presidio Trust that would serve as venues for the proposed action.

The project site is located within the San Francisco Bay Area Air Basin which is designated as a non-attainment area for the federal 8-hour ozone standard and the federal fine particulate (PM_{2.5}) standard. The Basin is designated as a maintenance area with respect to the federal CO standards. Increased emissions within the basin generated as a result of the proposed action could result in a delay of timely attainment of federal ozone and PM_{2.5} standards or continued maintenance of the federal carbon monoxide (CO) standards.

The CAA requires non-attainment areas to develop plans, known as State Implementation Plans (SIPs). SIPs are comprehensive plans that describe how an area will attain NAAQS. The 1990 amendments to the federal CAA set deadlines for attainment based on the severity of an area's air pollution problem. On November 1, 2001, the ARB approved the San Francisco Bay Area 2001 Ozone Attainment Plan for the 1-Hour National Ozone Standard (2001 Plan) as a revision to the SIP. The 2001 Plan contains a control strategy with seven new stationary source measures, five new transportation control measures, and eleven further-study measures. The new measures and on-going programs were to provide 271 tons per day of combined VOC and NO_x emission reductions. The 2001 Plan represents the current SIP for the San Francisco Bay Area Air Basin.

3. Assessment of Conformity Emissions

Emission sources resulting from the proposed action would include the following:

- **Construction Sources.** These include emissions from construction equipment and support vessels at piers used to support AC34 events as well as venue locations that would be applicable to each alternative. Emissions from on-road truck deliveries for construction materials are also assumed to occur.
- **In-Air Sources.** These include emissions from helicopters used to film race activities.
- **In-Water Sources.** These include emissions from vessels used for a variety of reasons. In this analysis, vessel emissions are separated into five categories: race sponsored spectator vessels, race support vessels, large private spectator vessels (superyachts), small private vessels and support tugs.
- **On-Road Trucks.** These emissions would be generated by trucks performing equipment and supply delivery to AC34 support and venue locations.
- **Off-Road Sources.** These are emissions from a variety of off-road equipment sources at AC34 support and venue locations. They primarily are emitted by generators supplying

electrical power to locations where utility power is not available, diesel-powered light standards, forklifts, and boat lifts.

- **On-Road Spectator Traffic.**
- **Decommissioning of Shoreside Power at Pier 27.** These emissions would occur from operation of diesel powered generators and an increase in cruise ship “hoteling” emissions as the result of the temporary decommissioning of shore-side power at Pier 27 so that the Pier may be used for the America’s Cup Village in 2013.

The proposed action would also result in an air quality benefit that would result in the provision of permanent shoreside power at Pier 70.

- **Installation of Shoreside Power at Pier 70.** This project element would develop shoreside power at an offsite location that would consist of constructing 12 MW of shoreside power at the Port's Drydock #2 at Pier 70 to serve large cruise, military and other vessels while they are in drydock. Emission reduction from this project element would more than offset those generated by the temporary loss of shoreside power at Pier 27.

The proposed action would generate air emissions from a variety of different sources. Project construction would generate emission of NO_x, VOC, PM_{2.5}, and CO from construction equipment and support vessels used in construction activities. Over the two year intermittent operation period, the Project would result in an increase in emissions primarily due to temporary increases in marine operations of race-sponsored passenger vessels, race-support vessels, and spectator vessels, including superyachts. Other emissions associated with the AC34 project include increased motor vehicle trips from race-related activities including spectators, operation of diesel powered generators and an increase in cruise ship “hoteling” emissions as the result of the temporary decommissioning of shore-side power at Pier 27 so that the Pier may be used for the America’s Cup Village in 2013. Emissions generated from the temporary loss of shoreside power at Pier 27 (which would be restored in 2014 after the conclusion of the races) would be more than offset by the proposed installation of permanent shoreside power at Pier 70. The proposed action would not include any on-site permitted stationary sources or area sources.

All of the emissions sources associated with the proposed action would generate emissions of VOC, NO_x and PM_{2.5} in an air basin designated as non-attainment for ozone and PM_{2.5} NAAQS. Additionally, the proposed action would result in an increase in CO emissions in an air basin designated as a maintenance area for CO. Consequently, these emissions must be evaluated with respect to the General Conformity process to determine the potential for adverse impacts related to air quality.

3.1 Construction and Demolition Emissions

Demolition of existing structures would occur at Piers 27-29 and Piers 30-32 in 2012. Installation of temporary floating docks would occur at Piers 30-32, Pier 80, and Marina Green for the AC34 2012 events. Other construction activities in 2012 would include construction of the new cruise

terminal building “cold shell” and paving/concrete improvements at Piers 27-29, and installation of the team base at Piers 30-32 and/or Pier 80. Emissions would also result from construction and erection of facilities at spectator locations. For the AC34 2013 events, construction of temporary floating docks and/or wave attenuators would occur at several locations (e.g., Pier 9, Pier 14, Piers 30-32, 32-36, 27-29, 26-28, 23, and 1; Piers 9-15 water basin; Rincon Point Open Water Basin; Piers 17-19; and Fort Mason). Mooring anchoring would be installed at Brannan Street Wharf Open Water Basin and Piers 27-29, and dredging would occur at Brannan Street Wharf Open Water Basin and Pier 28. The team base would remain at Piers 30-32. In addition, all temporary floating docks, the communications barge, associated pilings and mooring anchoring, and the Pier 80 and Piers 30-32 team bases would be removed in 2013 after completion of the AC34 events.

Construction exhaust emissions of criteria air pollutants were estimated by first collecting extensive information on all of the different types of air emissions sources involved in project construction and the level of activity anticipated from these sources during each phase of construction. This information was then combined with emission factors applicable to each source type to generate criteria pollutant emission estimates.

Emission factors for construction equipment used for water-based construction activities (e.g., pile driving and removal, installation and removal of temporary docks) were taken from the California Air Resources Board (CARB) OFFROAD 2007 model except for tugboats and other on-water equipment for which emission factors were taken from the San Francisco Bay Seaport Emissions Inventory and the Port of San Francisco Emissions Inventory.¹ Emissions from land-based construction activities such as building demolition, temporary team base construction, and demolition and construction of the cruise terminal “cold shell” at Piers 27-29 were estimated using equipment types and hours of operations supplied by the project sponsor and exhaust emission factors from the OFFROAD model. On-road vehicle emissions for construction were based on the following data: numbers and types of vehicles (worker vehicles, equipment delivery trucks) and number of trips anticipated for these vehicles. Vehicle emission factors were taken from the CARB’s EMFAC 2007. Further details on the methodology and assumptions used for assessing construction emissions are provided in Appendix AQ.

3.1 Operational Emissions

The America’s Cup events during 2012 and 2013 would involve a wide variety of activities, both on water and on land, as well as race-related helicopter activities. On-water activities would include boat and yacht trips (e.g., race-sponsored spectator vessels, race support vessels, small and large private spectator boats, and assist tugs). Boat lifts would be used at several locations. On-land activities would include generators and other equipment used at race-sponsored viewing sites and on-road vehicle trips. Helicopters would be used for broadcasting and media operations and would follow each race route. In addition, the increase in cruise ship emissions at Pier 27 during 2013 associated with the loss of the shore power hookup (which would be relocated and disconnected until completion of the AC34 events at Piers 27-29) during the America’s Cup are included in the AC34 operational emissions total.

¹ Bay Planning Coalition, SF Bay Area Seaports Air Emissions Inventory: Port of San Francisco 2005 Emissions Inventory, prepared by Moffatt & Nichol and ENVIRON, June 2010.

AC34 operation emissions were estimated based on activity data provided by the project sponsor. Emissions from spectator and other boats, boat lifts, generators, and other power equipment to be used at race venues were estimated from these activity levels and applicable emission factors derived from the OFFROAD model. Emissions from trucks that would be used to deliver supplies and equipment for race events were estimated based on numbers of trips for each truck type at each race venue as supplied by the project sponsor and trip emissions generated by the CARB's EMFAC 2007 BURDEN model. Emissions from increased traffic from spectators and the relocation of the Bauer Transportation warehouse from Pier 27 to Pier 50 were also estimated using EMFAC2007 BURDEN model. The analysis also accounted for incrementally increased cruise ship hoteling² emissions at Pier 35 resulting from the removal of the shore-side power system installed at Pier 27 in 2010. Details are provided in Appendix AQ.

Emissions associated with helicopters frequenting the helipad during AC34 races were estimated using data provided by the project sponsor and Emissions and Dispersion Modeling System (EDMS) software, developed by the United States Federal Aviation Administration (EDMS Version 5.1, 2008, Office of Environment and Energy, Federal Aviation Administration). Total criteria air pollutant emissions (including those emitted in-flight) were evaluated for the project-wide emissions inventory.

Because a variety of activities would occur throughout the AC34 event period, the number of days of "race operations" in each year was determined on the basis of the length of time that major operations are scheduled to take place (assumed to be 20 days in 2012 and 50 days in 2013 for vessel and on-road traffic and 80 days in 2012 and 90 days in 2013 for other sources), not simply the number of days on which actual races are scheduled.

Table 1 presents an estimate of the totality of air emissions of VOC, NO_x, PM_{2.5} and CO and offsets of these pollutants that would occur as a result of the proposed action. This table tabulates both construction emissions and operational emissions for year 2012 and 2013. Emissions are totaled in terms of tons per year for comparison to de minimis thresholds established by the 1990 amendments to the CAA for the purposes of general conformity assessment.

As can be seen from the data in Table 1, emissions of ozone precursors (NO_x and VOC) and PM_{2.5} from the proposed action would be below de minimis thresholds for the San Francisco Bay Area Air Basin (100 tons per year, respectively) for both 2012 and 2013. Table 1 shows that emissions of CO from the proposed action would exceed de minimis thresholds for the San Francisco Bay Area Air Basin (100 tons per year) in both 2012 and 2013. Consequently, pursuant to Sections 39.158(b) and 39.159 of the 1990 CAA, dispersion modeling was conducted to assess whether localized concentrations of CO would approach the NAAQS.

² Hoteling refers to the period of time a cruise ship is at dock and generating its own power for lighting, heating and other necessary functions while at port in the absence of shoreside power.

TABLE 1

AC34 MAXIMUM ANNUAL OPERATIONAL EMISSIONS FOR THE PROPOSED ACTION

	Maximum Annual Emissions (short tons/year)			
	VOC	NOx	CO	PM2.5
2012				
AC34 Construction	0.31	2	1	0
Race Sponsored Vessels	1	6	2	0
Race Support Vessels	11	5	122	0
Small Private Vessels	8	1	13	0
Large Private Vessels	0	0	0	0
Assist Tugs	0	0	0	0
Other Sources ^a	1	8	13	0
Spectator Traffic	2	4	42	0
Pier 70 Shore Side Power Installation	- 9	-176	-15	-5
2012 Total	14	-150	178	-5
De minimis Threshold for SF Bay Area	100	100	100	100
Above Threshold?	No	No	Yes	No
2013				
AC34 Construction	2	16	6	1
Race Sponsored Vessels	1	17	5	1
Race Support Vessels	53	22	590	1
Small Private Vessels	28	3	45	1
Large Private Vessels	5	54	15.0	2
Assist Tugs	0	0	0	0
Other Sources ^a	4	31	37	1
Shoreside Power Temporary Decommissioning (2013)	2	49	4	1
Pier 70 Shore Side Power Installation	-11	-215	-18	-6
Spectator Traffic	5	10	97	1
2013 Total	89	-13	821	3
De minimis Threshold for SF Bay Area	100	100	100	100
Above Threshold?	No	No	Yes	No

NOTES:

^a Other sources include boat lifts, generators, helicopters, and truck trips.

SOURCE: ENVIRON, 2011

3.2 Carbon Monoxide Dispersion Modeling

Sources of CO include boat and yacht trips (race-sponsored spectator vessels, race support vessels, small and large private spectator boats, and assist tugs), boat lifts, generators and other equipment used at race-sponsored viewing sites, passenger vehicle traffic, and helicopter operations. In addition, the increase in cruise ship emissions at Pier 27 during 2012 and 2013 associated with the loss of the shore power hookup during the America's Cup are included in the modeling analysis.

CO concentrations were calculated for both residential and non-residential (spectator) receptors. Non-residential receptors include areas the public may potentially have repeated access to during the AC34 events and include race-sponsored spectator locations. The general locations of primary viewing locations include Fort Baker Pier at Cavallo Point, Crissy Field, Marina Green, Fort Mason, Aquatic Park, Alcatraz Island, and Piers 27-29 (which would serve as the America's Cup Village in 2013).

Table 2 presents the CO concentrations associated with AC34 operations, an ambient background concentration and the resultant CO concentrations occurring with the proposed action. Estimated maximum 1-hour CO concentrations would be 6.6 parts per million (ppm) and therefore well below the NAAQS of 35 ppm. Estimated maximum 8-hour CO concentrations would be 4.2 ppm, well below the NAAQS of 9 ppm.

4. General Conformity Determination

Emissions of VOC, NO_x and PM_{2.5} generated by both construction and operation of the proposed action in 2012 and 2013 would be less than de minimis thresholds that apply to the San Francisco Bay Area Air Basin for these pollutants in a non-attainment area. Therefore, the AC34 project would therefore be considered to conform to the SIP.

Emissions of CO generated by both construction and operation of the proposed action in 2012 and 2013 would exceed the de minimis thresholds for a CO maintenance area established by the CAA General Conformity Rule. Therefore, pursuant to Section 39.158(b) of the 1990 CAA, dispersion modeling was conducted to assess whether localized concentrations of CO would approach the NAAQS. Results of this modeling effort indicate that worst-case localized concentrations of CO would remain well below the NAAQS and the proposed action would not hinder continued maintenance of the NAAQS for CO.

5. Conclusion

Based on the information and analysis presented above, approval of the AC34 project would conform to the California State Implementation Plan implemented pursuant to the CAA. Emissions of ozone precursors and PM_{2.5} would be below de minimis thresholds established in Title 40 of the CFR, Part 51.853 (b) (1), while modeled CO concentrations would be well below the applicable NAAQS for both 1-hour and 8-hour average concentrations.

TABLE 2: AC34 MAXIMUM LOCALIZED CARBON MONOXIDE CONCENTRATIONS FOR THE SPONSOR PROPOSED PROJECT (ALTERNATIVE B) IN 2013

Scenario	Maximum 1-hour Average Carbon Monoxide Concentration (ppm)			
	Project 1-hour Concentration	Ambient 1-hour Concentration	Total 1-hour Concentration	NAAQS
Construction	2.9	1.6	4.5	35
Operations	5.1	1.6	6.7	35
	Maximum 8-Hour Average Carbon Monoxide Concentration (ppm)			
	Project 8-hour Concentration	Ambient 8-hour Concentration	Total 8-hour Concentration	NAAQS
Construction	1.4	1.2	2.6	9
Operations	3.0	1.2	4.2	9
NOTES: ppm = ; NAAQS = national ambient air quality standard SOURCE: ENVIRON/ESA, 2011				

5. References

California Air Resources Board (CARB). 2006a. Emission Factors (EMFAC2007) model (Version 2.3). November. Available at: http://www.arb.ca.gov/msei/onroad/latest_version.htm

California Air Resources Board (CARB) . 2006b. Off-Road Emissions Inventory (OFFROAD2007). Mobile Source Emissions Inventory Program. December. Available at: <http://www.arb.ca.gov/msei/offroad/offroad.htm>

U.S. EPA, *National Ambient Air Quality Standards*, website <http://www.epa.gov/air/criteria.html>, accessed December 23, 2011.

U.S. EPA. 2004. United States Environmental Protection Agency (USEPA). 2004b. *User's Guide for the AMS/EPA Regulatory Model (AERMOD)*. Office of Air Quality Planning and Standards. Emissions Monitoring and Analysis Division. Research Triangle Park, North Carolina. EPA-454/B-03-001. September.

APPENDIX AQ

Supporting Documentation

EMISSION FACTORS FOR RACE OPERATIONS

Table X-X. 2012 Emission Factors for AC34 Race Operation

Activities/ Components	HP / Truck Type	Fuel Type	Source of EF ¹	EF Unit	ROG _{exh-D}	ROG _{exh-G}	ROG _{evp}	CO	NO _x	SO _x	PM10	DPM	PM2.5	PM _{tire}	PM _{brk}	CO ₂	CH ₄	N ₂ O
On-Water Sources																		
spect_boats - main	1000	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
spect_boats - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
race_vessels	300	G	OFFROAD	g/hp-hr	0.00	62.57	N/A ²	135.69	7.09	0.02	10.65	0.00	9.80	0.00	0.00	1129.87	3.89	0.23
assist_tug - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
priv_smvessels - Gas	101	G	OFFROAD	g/hp-hr	0.00	51.80	N/A ²	148.44	7.36	0.02	8.34	0.00	7.67	0.00	0.00	1167.59	3.21	0.42
priv_smvessels - Dsl	244	D	OFFROAD	g/hp-hr	8.96	0.00	0.00	11.75	26.74	0.02	0.68	0.66	0.62	0.00	0.00	1420.75	0.71	0.00
priv_lgvessels - main	3300	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
priv_lgvessels - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment																		
Generator 60kw/500A	105	D	OFFROAD	g/hp-hr	1.02	0.00	0.00	3.60	5.85	0.01	0.46	0.46	0.42	0.00	0.00	568.30	0.08	0.00
Generator-144KW/1200 AMps	252	D	OFFROAD	g/hp-hr	0.38	0.00	0.00	1.28	4.32	0.01	0.13	0.13	0.12	0.00	0.00	568.30	0.03	0.00
Generator Twin Pack400Twin	1072	D	OFFROAD	g/hp-hr	0.39	0.00	0.00	1.28	4.44	0.01	0.13	0.13	0.12	0.00	0.00	568.30	0.03	0.00
19' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32' scissor lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60' Boomlift	83	D	OFFROAD	g/hp-hr	1.04	0.00	0.00	3.99	5.45	0.01	0.50	0.50	0.46	0.00	0.00	568.30	0.08	0.00
5k Warehouse (forklift)	41	D	OFFROAD	g/hp-hr	2.31	0.00	0.00	6.48	5.75	0.01	0.52	0.52	0.48	0.00	0.00	568.30	0.18	0.00
10k Reach forklift	99	D	OFFROAD	g/hp-hr	1.04	0.00	0.00	3.99	5.45	0.01	0.50	0.50	0.46	0.00	0.00	568.30	0.08	0.00
Event 4000w Light Tower	12	D	OFFROAD	g/hp-hr	1.02	0.00	0.00	3.87	5.87	0.01	0.34	0.34	0.31	0.00	0.00	568.30	0.08	0.00
boat_lifts	200	D	OFFROAD	g/hp-hr	0.66	0.00	0.00	1.57	5.43	0.01	0.20	0.20	0.18	0.00	0.00	568.30	0.05	0.00
On-Road Trucks																		
6' Gas Flatbed - idle	LHD2	G	EMFAC	g/hr	0.00	21.85	0.00	138.68	1.48	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
6' Gas Flatbed - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.19	1.28	12.70	0.62	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
Pickup Truck - idle	LHD2	G	EMFAC	g/hr	0.00	21.85	0.00	138.68	1.48	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
Pickup Truck - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.19	1.28	12.70	0.62	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
26' Bobtail Truck - idle	HHD	D	EMFAC	g/hr	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72	0.00	0.00
26' Bobtail Truck - 5mph	HHD	D	EMFAC	g/mi	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36	0.00	0.00
On-Road Spectator Traffic																		
Private Auto	LDA	G	EMFAC	g/mi	0.00	0.06	0.03	1.88	0.19	0.00	0.01	0.00	0.01	0.00	0.01	371.03	0.00	0.00

- Notes:**
1. BPC: San Francisco Bay Area Seaports Air Emissions Inventory, 2005; OFFROAD: ARB OFFROAD 2007 Model; EMFAC: ARB EMFAC v2.3 Model
 2. Evaporative ROG emissions from gasoline-powered vessels are estimated by the OFFROAD model
 3. SO_x emissions for diesel marine sources are calculated based on fuel consumption
 4. Emissions from off-road equipment powered by electricity are not quantified in this analysis

Table X-X. 2013 Emission Factors for AC34 Race Operation

Activities/ Components	HP / Truck Type	Fuel Type	Source of EF ¹	EF Unit	ROGexh-D	ROGexh-G	ROGevp	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
On-Water Sources																		
spect_boats - main	1000	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
spect_boats - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
race_vessels	300	G	OFFROAD	g/hp-hr	0.00	59.15	N/A ²	128.46	7.13	0.02	10.65	0.00	9.80	0.00	0.00	1129.87	3.68	0.24
assist_tug - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
priv_smvessels - Gas	101	G	OFFROAD	g/hp-hr	0.00	48.02	N/A ²	141.22	7.27	0.02	8.48	0.00	7.80	0.00	0.00	1185.10	2.98	0.42
priv_smvessels - Dsl	244	D	OFFROAD	g/hp-hr	8.96	0.00	0.00	11.75	26.74	0.02	0.68	0.66	0.63	0.00	0.00	1420.75	0.71	0.00
priv_lgvessels - main	3300	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
priv_lgvessels - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment																		
Generator 60kw/500A	105	D	OFFROAD	g/hp-hr	0.93	0.00	0.00	3.57	5.48	0.01	0.42	0.42	0.39	0.00	0.00	568.30	0.07	0.00
Generator-144KW/1200 AMps	252	D	OFFROAD	g/hp-hr	0.36	0.00	0.00	1.21	3.99	0.01	0.11	0.11	0.11	0.00	0.00	568.30	0.03	0.00
Generator Twin Pack400Twin	1072	D	OFFROAD	g/hp-hr	0.37	0.00	0.00	1.21	4.11	0.01	0.12	0.12	0.11	0.00	0.00	568.30	0.03	0.00
19' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32' scissor lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60' Boomlift	83	D	OFFROAD	g/hp-hr	0.93	0.00	0.00	3.95	5.04	0.01	0.43	0.43	0.40	0.00	0.00	568.30	0.07	0.00
5k Warehouse (forklift)	41	D	OFFROAD	g/hp-hr	2.00	0.00	0.00	6.25	5.53	0.01	0.46	0.46	0.43	0.00	0.00	568.30	0.15	0.00
10k Reach forklift	99	D	OFFROAD	g/hp-hr	0.93	0.00	0.00	3.95	5.04	0.01	0.43	0.43	0.40	0.00	0.00	568.30	0.07	0.00
Event 4000w Light Tower	12	D	OFFROAD	g/hp-hr	0.97	0.00	0.00	3.80	5.62	0.01	0.32	0.32	0.29	0.00	0.00	568.30	0.07	0.00
boat_lifts	200	D	OFFROAD	g/hp-hr	0.62	0.00	0.00	1.49	5.04	0.01	0.18	0.18	0.16	0.00	0.00	568.30	0.05	0.00
On-Road Trucks																		
6' Gas Flatbed - idle	LHD2	G	EMFAC	g/hr	0.00	21.73	0.00	137.87	1.46	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
6' Gas Flatbed - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.04	1.20	11.05	0.56	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
Pickup Truck - idle	LHD2	G	EMFAC	g/hr	0.00	21.73	0.00	137.87	1.46	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
Pickup Truck - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.04	1.20	11.05	0.56	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
26' Bobtail Truck - idle	HHD	D	EMFAC	g/hr	10.96	0.00	0.00	48.55	113.98	0.06	1.35	1.35	1.24	0.00	0.00	6541.71	0.00	0.00
26' Bobtail Truck - 5mph	HHD	D	EMFAC	g/mi	7.81	0.00	0.00	12.93	27.24	0.04	1.50	1.50	1.38	0.01	0.01	3845.36	0.00	0.00
On-Road Spectator Traffic																		
Private Auto	LDA	G	EMFAC	g/mi	0.00	0.04	0.03	1.60	0.16	0.00	0.01	0.00	0.01	0.00	0.01	369.93	0.00	0.00

- Notes:**
1. BPC: San Francisco Bay Area Seaports Air Emissions Inventory, 2005; OFFROAD: ARB OFFROAD 2007 Model; EMFAC: ARB EMFAC v2.3 Model
 2. Evaporative ROG emissions from gasoline-powered vessels are estimated by the OFFROAD model
 3. SOx emissions for diesel marine sources are calculated based on fuel consumption
 4. Emissions from off-road equipment powered by electricity are not quantified in this analysis

On-Water Sources

Table X-X. 2012 AC34 On-Water Source Activity Data Summary

Location	Activity/Component	HP	LF	Fuel Type	Hours/Day/ Unit	# Days	# Units
AC Village: Marina Green	spect_boats - main	1000	42%	D	6	20	7
	spect_boats - aux	94	43%	D	6	20	7
	race_vessels	300	21%	G	6	20	10
Alcatraz	assist_tug_alcatraz - main	1500	50%	D	1	2	3
	assist_tug_alcatraz - aux	111	31%	D	1	2	3
Barge Helipad & Regional Airports	assist_tug - main	1500	50%	D	1	2	1
	assist_tug - aux	111	31%	D	1	2	1
Fort Mason	race_vessels	300	21%	G	6	20	5
Pier 30-32	race_vessels	300	21%	G	6	20	50
Pier 80	race_vessels	300	21%	G	6	20	5
Spectator Boats	priv_smvessels - Gas	101	20%	G	4	20	863
	priv_smvessels - Dsl	244	14%	D	4	20	10

Table X-X. 2013 AC34 On-Water Source Activity Data Summary

Location	Activity/Component	HP	LF	Fuel Type	Hours/Day/ Unit	# Days	# Units
Alcatraz	assist_tug_alcatraz - main	1500	50%	D	1	2	3
	assist_tug_alcatraz - aux	111	31%	D	1	2	3
Barge Helipad & Regional Airports	assist_tug - main	1500	50%	D	1	2	1
	assist_tug - aux	111	31%	D	1	2	1
Fort Mason	race_vessels	300	21%	G	6	50	5
Pier 19 and 19½	race_vessels	300	21%	G	6	50	20
Pier 23	spect_boats - main	1000	42%	D	6	50	2
	spect_boats - aux	94	43%	D	6	50	2
	race_vessels	300	21%	G	6	50	30
Pier 30-32	race_vessels	300	21%	G	6	50	40
Pier 80	race_vessels	300	21%	G	6	50	5
Piers 27-29 and Pier 29½	spect_boats - main	1000	42%	D	6	50	3
	spect_boats - aux	94	43%	D	6	50	3
	race_vessels	300	21%	G	6	50	5
Spectator Boats	priv_smvessels - Gas	101	20%	G	4	50	883
	priv_smvessels - Dsl	244	14%	D	4	50	13

In-Air Sources

Table X-X. 2012 AC34 In-Air Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Day/ Unit	# Days	# Units
Barge Helipad & Regional Airports	helicopter	400	Jet	6	20	2
	helicopter	320	G	6	20	1

Table X-X. 2013 AC34 In-Air Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Day/ Unit	# Days	# Units
Barge Helipad & Regional Airports	helicopter	400	Jet	6	50	2
	helicopter	320	G	6	50	1

Off-Road Sources

Table X-X. 2012 AC34 Off-Road Sources Activity Data Summary

Location	Activity/Component	HP	LF	Hours/Day/ Unit	Fuel Type	# Days	# Units
AC Village: Marina Green	Generator 60kw/500A	105	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	2
	32' scissor lift	0	0%	0	E	12	1
	5k Warehouse (forklift)	41	20%	2	D	12	3
	10k Reach forklift	99	20%	2	D	10	1
	Event 4000w Light Tower	12	50%	2	D	44	2
AC34 Live Sites	Generator 60kw/500A	105	50%	10	D	1	1
	Generator-144KW/1200 AMps	252	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	1
Alcatraz	Generator 60kw/500A	105	50%	10	D	2	1
	Generator Twin Pack400Twin	1072	50%	10	D	2	1
	19' Scissor Lift	0	0%	0	E	18	1
	5k Warehouse (forklift)	41	20%	2	D	18	2
	10k Reach forklift	99	20%	2	D	18	1
	Event 4000w Light Tower	12	50%	2	D	18	2
Cavallo Point	Generator 60kw/500A	105	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	2
	32' scissor lift	0	0%	0	E	12	1
	5k Warehouse (forklift)	41	20%	2	D	12	3
	10k Reach forklift	99	20%	2	D	10	1
	Event 4000w Light Tower	12	50%	2	D	38	2
Crissy Field	Generator 60kw/500A	105	50%	10	D	1	1
	Generator-144KW/1200 AMps	252	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	1
	19' Scissor Lift	0	0%	0	E	12	2
	60' Boomlift	83	20%	2	D	10	1
	5k Warehouse (forklift)	41	20%	2	D	12	2
	10k Reach forklift	99	20%	2	D	12	2
	Event 4000w Light Tower	12	50%	2	D	44	2
Fort Mason	Generator 60kw/500A	105	50%	10	D	1	1
	Generator-144KW/1200 AMps	252	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	1
	19' Scissor Lift	0	0%	0	E	15	2
	32' scissor lift	0	0%	0	E	15	2
	5k Warehouse (forklift)	41	20%	2	D	12	2
	Pier 30-32	boat_lifts	200	29%	24	D	80
Pier 32-36 Open Water Basin	boat_lifts	200	29%	24	D	80	2
Pier 80	boat_lifts	200	29%	24	D	80	2

Off-Road Sources

Table X-X. 2013 AC34 Off-Road Sources Activity Data Summary

Location	Activity/Component	HP	LF	Hours/Day/ Unit	Fuel Type	# Days	# Units
AC Village: Marina Green	Generator 60kw/500A	105	50%	10	D	21	1
	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	18	1
	5k Warehouse (forklift)	41	20%	2	D	25	3
	10k Reach forklift	99	20%	2	D	21	1
	Event 4000w Light Tower	12	50%	2	D	71	2
AC34 Live Sites	Generator-144KW/1200 AMps	252	50%	10	D	50	2
Alcatraz	Generator 60kw/500A	105	50%	10	D	26	1
	Generator Twin Pack400Twin	1072	50%	10	D	26	1
	19' Scissor Lift	0	0%	0	E	18	1
	5k Warehouse (forklift)	41	20%	2	D	18	2
	10k Reach forklift	99	20%	2	D	18	1
	Event 4000w Light Tower	12	50%	2	D	26	2
Cavallo Point	Generator 60kw/500A	105	50%	10	D	50	1
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	12	1
	5k Warehouse (forklift)	41	20%	2	D	12	3
	10k Reach forklift	99	20%	2	D	12	1
	Event 4000w Light Tower	12	50%	2	D	62	2
Crissy Field	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	19' Scissor Lift	0	0%	0	E	21	2
	60' Boomlift	83	20%	2	D	21	1
	5k Warehouse (forklift)	41	20%	2	D	21	2
	10k Reach forklift	99	20%	2	D	21	2
	Event 4000w Light Tower	12	50%	2	D	71	2
Fort Mason	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	19' Scissor Lift	0	0%	0	E	18	2
	32' scissor lift	0	0%	0	E	18	2
	5k Warehouse (forklift)	41	20%	2	D	18	2
Pier 19 and 19½	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	5k Warehouse (forklift)	41	20%	2	D	81	2
	10k Reach forklift	99	20%	2	D	81	1
Pier 23	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	5k Warehouse (forklift)	41	20%	2	D	81	2
	10k Reach forklift	99	20%	2	D	81	1

Off-Road Sources							
Pier 30-32	Generator 60kw/500A	105	50%	10	D	50	1
	Generator-144KW/1200 AMps	252	50%	10	D	50	1
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	19' Scissor Lift	0	0%	0	E	81	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	60' Boomlift	83	20%	2	D	81	1
	5k Warehouse (forklift)	41	20%	2	D	81	8
	10k Reach forklift	99	20%	2	D	81	4
	Event 4000w Light Tower	12	50%	2	D	131	4
	boat_lifts	200	29%	24	D	90	3
Pier 80	boat_lifts	200	29%	24	D	90	3
Piers 27-29 and Pier 29½	Generator-144KW/1200 AMps	252	50%	10	D	50	6
	Generator Twin Pack400Twin	1072	50%	10	D	50	6
	19' Scissor Lift	0	0%	0	E	81	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	60' Boomlift	83	20%	2	D	81	1
	5k Warehouse (forklift)	41	20%	2	D	81	5
	10k Reach forklift	99	20%	2	D	81	1
	Event 4000w Light Tower	12	50%	2	D	131	2

On-Road Trucks

Table X-X. 2012 AC34 On-Road Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Trip	Miles/Trip	# Days	# Trips
AC Village: Marina Green	6' Gas Flatbed - idle	12	G	0.17	N/A	30	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Alcatraz	6' Gas Flatbed - idle	12	G	0.17	N/A	18	3
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	18	3
	Pickup Truck - idle	250	G	0.17	N/A	18	2
	Pickup Truck - 5mph	250	G	N/A	0.25	18	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	18	10
26' Bobtail Truck - 5mph	450	D	N/A	0.25	18	10	
Cavallo Point	6' Gas Flatbed - idle	12	G	0.17	N/A	30	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Crissy Field	6' Gas Flatbed - idle	12	G	0.17	N/A	30	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	2
	Pickup Truck - idle	250	G	0.17	N/A	30	2
	Pickup Truck - 5mph	250	G	N/A	0.25	30	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Fort Mason	6' Gas Flatbed - idle	12	G	0.17	N/A	30	1
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	1
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	75
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	75

Off-Road Sources

Table X-X. 2013 AC34 On-Road Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Trip	Miles/Trip	# Days	# Trips
AC Village: Marina Green	6' Gas Flatbed - idle	12	G	0.17	N/A	71	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	71	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	500
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	500
Alcatraz	6' Gas Flatbed - idle	12	G	0.17	N/A	18	3
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	18	3
	Pickup Truck - idle	250	G	0.17	N/A	18	2
	Pickup Truck - 5mph	250	G	N/A	0.25	18	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	200
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	200
Cavallo Point	6' Gas Flatbed - idle	12	G	0.17	N/A	12	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	12	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Crissy Field	6' Gas Flatbed - idle	12	G	0.17	N/A	21	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	21	2
	Pickup Truck - idle	250	G	0.17	N/A	21	2
	Pickup Truck - 5mph	250	G	N/A	0.25	21	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	500
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	500
Fort Mason	6' Gas Flatbed - idle	12	G	0.17	N/A	18	1
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	18	1
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	150
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	150
Pier 19 and 19½	6' Gas Flatbed - idle	12	G	0.17	N/A	81	4
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	4
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Pier 23	6' Gas Flatbed - idle	12	G	0.17	N/A	81	4
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	4
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Pier 30-32	6' Gas Flatbed - idle	12	G	0.17	N/A	81	8
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	8
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	600
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	600
Piers 27-29 and Pier 29½	6' Gas Flatbed - idle	12	G	0.17	N/A	81	3
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	3
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	600
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	600

On-Road Spectator Traffic

Table X-X. 2012 AC34 On-Road Spectator Traffic Activity Data Summary

Location	Activity/Component	Fuel Type	Miles/Trip	# Days	Trips/Day
San Francisco Origin	Light Duty Passenger Cars	G	5	20	1,995
East Bay Origin	Light Duty Passenger Cars	G	11.5	20	9,452
North Bay Origin	Light Duty Passenger Cars	G	54.2	20	5,864
South Bay Origin	Light Duty Passenger Cars	G	50	20	10,165
Out of Region Origin	Light Duty Passenger Cars	G	62.4	20	1,282

Table X-X. 2013 AC34 On-Road Spectator Traffic Activity Data Summary

Location	Activity/Component	Fuel Type	Miles/Trip	# Days	Trips/Day
San Francisco Origin	Light Duty Passenger Cars	G	5	50	2,132
East Bay Origin	Light Duty Passenger Cars	G	11.5	50	10,051
North Bay Origin	Light Duty Passenger Cars	G	54.2	50	6,451
South Bay Origin	Light Duty Passenger Cars	G	50	50	10,846
Out of Region Origin	Light Duty Passenger Cars	G	62.4	50	1,325

In-Air Sources

Table X-X. 2012 AC34 Operation In-Air Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Barge Helipad& Regional Airports	556	21,936	400.63	95.93	0.00	0.00	0.00	0.00	0.00	234,258	0.00	0.00

Table X-X. 2013 AC34 Operation In-Air Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Barge Helipad& Regional Airports	1,384	54,674	998.92	239.04	0.00	0.00	0.00	0.00	0.00	583,726	0.00	0.00

Cruise Terminal Auxiliary Engine Operation Emissions due to Lack of Shore Side Power

Table X-X. 2012 AC34 Operation No Shore Power Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Piers 27-29 Cruise Terminal	1,580	3,324	41,754	1,441	797	773	731	0	0	3,506,984	279	0

Table X-X. 2013 AC34 Operation No Shore Power Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Piers 27-29 Cruise Terminal	1,580	3,324	41,754	1,441	797	773	731	0	0	3,506,984	279	0

Off-Road Equipment

Table X-X. 2012 AC34 Operation Off-Road Equipment Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village	193.78	633	2,020	2.58	65.42	65.42	60.19	0.00	0.00	254,050	14.87	0.00
AC34 Live Sites	103.33	336	1,158	1.49	33.77	33.77	31.07	0.00	0.00	148,709	7.93	0.00
Alcatraz	17.20	57	139	0.18	5.85	5.85	5.38	0.00	0.00	16,802	1.32	0.00
Cavallo Point	193.46	632	2,019	2.58	65.32	65.32	60.09	0.00	0.00	253,871	14.84	0.00
Crissy Field	110.64	362	1,192	1.54	36.43	36.43	33.51	0.00	0.00	152,132	8.49	0.00
Fort Mason	105.35	342	1,163	1.50	34.23	34.23	31.49	0.00	0.00	149,205	8.08	0.00
Pier 30-32	320.68	767	2,648	3.12	95.99	95.99	88.31	0.00	0.00	277,247	24.60	0.00
Pier 32-36 Open Water Basin	320.68	767	2,648	3.12	95.99	95.99	88.31	0.00	0.00	277,247	24.60	0.00
Pier80	320.68	767	2,648	3.12	95.99	95.99	88.31	0.00	0.00	277,247	24.60	0.00

Table X-X. 2013 AC34 Operation Off-Road Equipment Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village	562.00	1,877	6,096	8.46	182.08	182.08	167.51	0.00	0.00	840,952	43.11	0.00
AC34 Live Sites	97.92	334	1,099	1.54	31.63	31.63	29.10	0.00	0.00	156,556	7.51	0.00
Alcatraz	145.25	495	1,440	1.97	50.00	50.00	46.00	0.00	0.00	192,532	11.14	0.00
Cavallo Point	491.10	1,649	5,165	7.12	163.42	163.42	150.35	0.00	0.00	701,790	37.67	0.00
Crissy Field	109.43	378	1,155	1.62	35.79	35.79	32.93	0.00	0.00	162,513	8.39	0.00
Fort Mason	100.53	342	1,106	1.55	32.23	32.23	29.66	0.00	0.00	157,299	7.71	0.00
Pier 19 and 19½	547.12	1,818	5,987	8.32	174.42	174.42	160.47	0.00	0.00	829,925	41.97	0.00
Pier 23	547.12	1,818	5,987	8.32	174.42	174.42	160.47	0.00	0.00	829,925	41.97	0.00
Pier 30-32	1,136.02	3,356	10,214	13.64	353.75	353.75	325.45	0.00	0.00	1,285,471	87.15	0.00
Pier80	510.42	1,230	4,150	5.26	146.38	146.38	134.67	0.00	0.00	467,854	39.16	0.00
Piers 27-29 and Pier 29½	1,634.46	5,429	17,943	24.95	520.51	520.51	478.87	0.00	0.00	2,487,316	125.39	0.00

On-Road Trucks

Table X-X. 2012 AC34 Operation On-Road Trucks Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village	3.25	11.24	17.52	0.01	0.46	0.46	0.42	0.00	0.00	1,546	0.00	0.00
Alcatraz	2.46	9.87	10.56	0.01	0.28	0.27	0.25	0.00	0.00	1,097	0.00	0.00
Cavallo Point	3.25	11.24	17.52	0.01	0.46	0.46	0.42	0.00	0.00	1,546	0.00	0.00
Crissy Field	3.81	14.72	17.58	0.02	0.46	0.46	0.42	0.00	0.00	1,734	0.00	0.00
Fort Mason	0.95	3.68	4.39	0.00	0.11	0.11	0.11	0.00	0.00	433	0.00	0.00

Table X-X. 2013 AC34 Operation On-Road Trucks Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village	5.48	20.54	28.57	0.03	0.66	0.66	0.61	0.00	0.00	2,708	0.00	0.00
Alcatraz	2.50	10.10	11.46	0.01	0.27	0.26	0.25	0.00	0.00	1,187	0.00	0.00
Cavallo Point	2.72	8.85	17.09	0.01	0.40	0.40	0.37	0.00	0.00	1,432	0.00	0.00
Crissy Field	4.94	17.25	28.52	0.02	0.66	0.66	0.61	0.00	0.00	2,526	0.00	0.00
Fort Mason	1.42	4.77	8.55	0.01	0.20	0.20	0.18	0.00	0.00	735	0.00	0.00
Pier 19 and 19½	5.49	25.88	17.34	0.02	0.40	0.40	0.37	0.00	0.00	2,375	0.00	0.00
Pier 23	5.49	25.88	17.34	0.02	0.40	0.40	0.37	0.00	0.00	2,375	0.00	0.00
Pier 30-32	10.97	51.76	34.69	0.05	0.81	0.79	0.74	0.00	0.01	4,749	0.00	0.00
Piers 27-29 and Pier 29½	7.24	28.77	34.35	0.03	0.80	0.79	0.73	0.00	0.00	3,477	0.00	0.00

On-Water Sources

Table X-X. 2012 AC34 Operation On-Water Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village	11649	26112	12937	8	2281	478	2122	0	0	191327	659	40
Alcatraz	13	39	147	0	6	6	6	0	0	0	0	0
Barge Helipad& Regional Airports	4	13	49	0	2	2	2	0	0	0	0	0
Fort Mason	5323	11489	601	2	902	0	830	0	0	95663	329	20
Pier 30-32	53234	114886	6006	16	9017	0	8296	0	0	956634	3293	199
Pier80	5323	11489	601	2	902	0	830	0	0	95663	329	20
Spectator Vessels	166673	464417	24689	18	26080	42	23994	0	0	3736735	10082	1326

Table X-X. 2013 AC34 Operation On-Water Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Alcatraz	13	39	147	0	6	6	6	0	0	0	0	0
Barge Helipad& Regional Airports	4	13	49	0	2	2	2	0	0	0	0	0
Brannan Street Wharf	3665	11321	41233	17	1701	1701	1650	0	0	0	0	0
Fort Mason	12,881	28,099	4,794	5	2,390	136	2,206	0	0	239158.579	778.173899	50.0392806
Pier 19 and 19½	50,702	109,883	10,227	17	9,188	171	8,461	0	0	956634.315	3112.6956	200.157123
Pier 23	76,233	165,384	17,436	27	13,867	341	12,774	0	0	1434951.47	4669.0434	300.235684
Pier 26 and 28	50,344	108,763	6,035	16	9,017	0	8,296	0	0	956634.315	3112.6956	200.157123
Pier 30-32	100,689	217,527	12,070	31	18,034	0	16,591	0	0	1913268.63	6225.3912	400.314245
Pier80	12,586	27,191	1,509	4	2,254	0	2,074	0	0	239158.579	778.173899	50.0392806
Piers 27-29 and Pier 29½	19,558	48,714	79,783	35	5,486	3,232	5,209	0	0	239158.579	778.173899	50.0392806
Spectator Vessels	399,544	1,136,769	63,460	158	68,224	126	62,766	0	0	9790222.59	24062.2353	3369.88289

On-Road Spectator Traffic

Table X-X. 2012 AC34 Operation On-Road Spectator Traffic Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
San Francisco	40	825	81	2	5	0	4	1	2	163,157	0	0
East Bay	437	8,992	888	17	50	0	45	10	24	1,778,304	0	0
North Bay	1,279	26,291	2,596	50	145	0	132	28	70	5,199,361	0	0
South Bay	2,045	42,044	4,151	80	233	0	210	45	112	8,314,783	0	0
Out of Region	322	6,618	653	13	37	0	33	7	18	1,308,868	0	0

Table X-X. 2013 AC34 Operation On-Road Spectator Traffic Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
San Francisco	89	1,876	188	4	12	0	11	2	6	434,722	0	0
East Bay	964	20,338	2,039	46	132	0	119	25	64	4,713,564	0	0
North Bay	2,917	61,523	6,169	138	399	0	361	77	193	14,258,542	0	0
South Bay	4,524	95,418	9,567	214	618	0	560	120	299	22,114,176	0	0
Out of Region	690	14,544	1,458	33	94	0	85	18	46	3,370,804	0	0

CARBON MONOXIDE EMISSIONS SOURCES

On-Water Sources
Table X-X. 2012 AC34 On-Water Source Activity Data Summary

Location	Activity/Component	HP	LF	Fuel Type	Hours/Day/ Unit	# Days	# Units
AC Village: Marina Green	spect_boats - main	1000	42%	D	6	20	7
	spect_boats - aux	94	43%	D	6	20	7
	race_vessels - gas	279	21%	G	6	20	8
	race_vessels - dsl	722	23%	D	6	20	2
Alcatraz	assist_tug_alcatraz - main	1500	50%	D	1	2	3
	assist_tug_alcatraz - aux	111	31%	D	1	2	3
Barge Helipad& Regional Airports	assist_tug - main	1500	50%	D	1	2	1
	assist_tug - aux	111	31%	D	1	2	1
Fort Mason	race_vessels - gas	279	21%	G	6	20	4
	race_vessels - dsl	722	23%	D	6	20	1
Pier 30-32	race_vessels - gas	279	21%	G	6	20	40
	race_vessels - dsl	722	23%	D	6	20	10
Pier 80	race_vessels - gas	279	21%	G	6	20	4
	race_vessels - dsl	722	23%	D	6	20	1
Spectator Boats	motor_craft - gas	101	21%	G	4	20	30
	sailboats - gas	13	23%	G	2	20	84
	sailboats - dsl	37	23%	D	2	20	42

Table X-X. 2013 AC34 On-Water Source Activity Data Summary

Location	Activity/Component	HP	LF	Fuel Type	Hours/Day/ Unit	# Days	# Units
Alcatraz	assist_tug_alcatraz - main	1500	50%	D	1	2	3
	assist_tug_alcatraz - aux	111	31%	D	1	2	3
Barge Helipad& Regional Airports	assist_tug - main	1500	50%	D	1	2	1
	assist_tug - aux	111	31%	D	1	2	1
Fort Mason	race_vessels - gas	287	21%	G	6	50	4
	race_vessels - dsl	722	23%	D	6	50	1
	priv_lgvessels - main	3300	0.14	D	4	50	1
	priv_lgvessels - aux	94	0.43	D	8	50	1
Pier 9	priv_lgvessels - main	3300	14%	D	4	50	2
	priv_lgvessels - aux	94	43%	D	8	50	2
Piers 14-22.5 Open Water Basin	spect_boats - main	1000	0.42	D	6	50	2
	spect_boats - aux	94	0.43	D	6	50	2
	priv_lgvessels - main	3300	0.14	D	4	50	10
	priv_lgvessels - aux	94	0.43	D	8	50	10
Pier 19 and 19½	spect_boats - main	1000	42%	D	6	50	1
	spect_boats - aux	94	43%	D	6	50	1
	race_vessels - gas	287	21%	G	6	50	17
	race_vessels - dsl	722	23%	D	6	50	3
Pier 26 and 28	race_vessels - gas	287	21%	G	6	50	17
	race_vessels - dsl	722	23%	D	6	50	3
Pier 23	spect_boats - main	1000	42%	D	6	50	2
	spect_boats - aux	94	43%	D	6	50	2
	race_vessels - gas	287	21%	G	6	50	26
	race_vessels - dsl	722	23%	D	6	50	4
Pier 30-32	race_vessels - gas	287	21%	G	6	50	34
	race_vessels - dsl	722	23%	D	6	50	6
Pier 80	race_vessels - gas	287	21%	G	6	50	4
	race_vessels - dsl	722	23%	D	6	50	1
Piers 27-29 and Pier 29½	spect_boats - main	1000	42%	D	6	50	3
	spect_boats - aux	94	43%	D	6	50	3
	race_vessels - gas	287	21%	G	6	50	4
	race_vessels - dsl	722	23%	D	6	50	1
	priv_lgvessels - main	3300	14%	D	4	50	20
	priv_lgvessels - aux	94	43%	D	8	50	20
Spectator Boats	motor_craft - gas	100	22%	G	4	50	44
	sailboats - gas	13	23%	G	2	50	122
	sailboats - dsl	37	23%	D	2	50	63

In-Air Sources

Table X-X. 2012 AC34 In-Air Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Day/ Unit	# Days	# Units
Barge Helipad& Regional Airports	helicopter	400	Jet	6	20	2
	helicopter	320	G	6	20	1

Table X-X. 2013 AC34 In-Air Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Day/ Unit	# Days	# Units
Barge Helipad& Regional Airports	helicopter	400	Jet	6	50	2
	helicopter	320	G	6	50	1

Off-Road Sources

Table X-X. 2012 AC34 Off-Road Sources Activity Data Summary

Location	Activity/Component	HP	LF	Hours/Day/ Unit	Fuel Type	# Days	# Units
AC Village: Marina Green	Generator 60kw/500A	105	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	2
	32' scissor lift	0	0%	0	E	12	1
	5k Warehouse (forklift)	41	20%	2	D	12	3
	10k Reach forklift	99	20%	2	D	10	1
	Event 4000w Light Tower	12	50%	2	D	44	2
AC34 Live Sites	Generator 60kw/500A	105	50%	10	D	1	1
	Generator-144KW/1200 AMps	252	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	1
Alcatraz	Generator 60kw/500A	105	50%	10	D	2	1
	Generator Twin Pack400Twin	1072	50%	10	D	2	1
	19' Scissor Lift	0	0%	0	E	18	1
	5k Warehouse (forklift)	41	20%	2	D	18	2
	10k Reach forklift	99	20%	2	D	18	1
	Event 4000w Light Tower	12	50%	2	D	18	2
Cavallo Point	Generator 60kw/500A	105	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	2
	32' scissor lift	0	0%	0	E	12	1
	5k Warehouse (forklift)	41	20%	2	D	12	3
	10k Reach forklift	99	20%	2	D	10	1
	Event 4000w Light Tower	12	50%	2	D	38	2
Crissy Field	Generator 60kw/500A	105	50%	10	D	1	1
	Generator-144KW/1200 AMps	252	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	1
	19' Scissor Lift	0	0%	0	E	12	2
	60' Boomlift	83	20%	2	D	10	1
	5k Warehouse (forklift)	41	20%	2	D	12	2
	10k Reach forklift	99	20%	2	D	12	2
	Event 4000w Light Tower	12	50%	2	D	44	2
Fort Mason	Generator 60kw/500A	105	50%	10	D	1	1
	Generator-144KW/1200 AMps	252	50%	10	D	18	1
	Generator Twin Pack400Twin	1072	50%	10	D	18	1
	19' Scissor Lift	0	0%	0	E	15	2
	32' scissor lift	0	0%	0	E	15	2
	5k Warehouse (forklift)	41	20%	2	D	12	2
Pier 30-32	boat_lifts	200	29%	24	D	80	2
Pier 32-36 Open Water Basin	boat_lifts	200	29%	24	D	80	2
Pier 80	boat_lifts	200	29%	24	D	80	2

Table X-X. 2013 AC34 Off-Road Sources Activity Data Summary

Location	Activity/Component	HP	LF	Hours/Day/ Unit	Fuel Type	# Days	# Units
AC Village: Marina Green	Generator 60kw/500A	105	50%	10	D	21	1
	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	18	1
	5k Warehouse (forklift)	41	20%	2	D	25	3
	10k Reach forklift	99	20%	2	D	21	1
	Event 4000w Light Tower	12	50%	2	D	71	2
AC34 Live Sites	Generator-144KW/1200 AMps	252	50%	10	D	50	2
Alcatraz	Generator 60kw/500A	105	50%	10	D	26	1
	Generator Twin Pack400Twin	1072	50%	10	D	26	1
	19' Scissor Lift	0	0%	0	E	18	1
	5k Warehouse (forklift)	41	20%	2	D	18	2
	10k Reach forklift	99	20%	2	D	18	1
	Event 4000w Light Tower	12	50%	2	D	26	2
Cavallo Point	Generator 60kw/500A	105	50%	10	D	50	1
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	12	1
	5k Warehouse (forklift)	41	20%	2	D	12	3
	10k Reach forklift	99	20%	2	D	12	1
	Event 4000w Light Tower	12	50%	2	D	62	2
Crissy Field	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	19' Scissor Lift	0	0%	0	E	21	2
	60' Boomlift	83	20%	2	D	21	1
	5k Warehouse (forklift)	41	20%	2	D	21	2
	10k Reach forklift	99	20%	2	D	21	2
	Event 4000w Light Tower	12	50%	2	D	71	2
Fort Mason	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	19' Scissor Lift	0	0%	0	E	18	2
	32' scissor lift	0	0%	0	E	18	2
	5k Warehouse (forklift)	41	20%	2	D	18	2
Pier 19 and 19½	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	5k Warehouse (forklift)	41	20%	2	D	81	2
	10k Reach forklift	99	20%	2	D	81	1
Pier 23	Generator-144KW/1200 AMps	252	50%	10	D	50	2
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	5k Warehouse (forklift)	41	20%	2	D	81	2
	10k Reach forklift	99	20%	2	D	81	1
Pier 30-32	Generator 60kw/500A	105	50%	10	D	50	1
	Generator-144KW/1200 AMps	252	50%	10	D	50	1
	Generator Twin Pack400Twin	1072	50%	10	D	50	2
	19' Scissor Lift	0	0%	0	E	81	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	60' Boomlift	83	20%	2	D	81	1
	5k Warehouse (forklift)	41	20%	2	D	81	8
	10k Reach forklift	99	20%	2	D	81	4
	Event 4000w Light Tower	12	50%	2	D	131	4
Pier 80	boat_lifts	200	29%	24	D	90	3
	boat_lifts	200	29%	24	D	90	3

Piers 27-29 and Pier 29½	Generator-144KW/1200 AMps	252	50%	10	D	50	6
	Generator Twin Pack400Twin	1072	50%	10	D	50	6
	19' Scissor Lift	0	0%	0	E	81	2
	32' scissor lift	0	0%	0	E	81	2
	43' Scissor Lift	0	0%	0	E	81	2
	60' Boomlift	83	20%	2	D	81	1
	5k Warehouse (forklift)	41	20%	2	D	81	5
	10k Reach forklift	99	20%	2	D	81	1
Event 4000w Light Tower	12	50%	2	D	131	2	

On-Road Trucks

Table X-X. 2012 AC34 On-Road Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Trip	Miles/Trip	# Days	# Trips
AC Village: Marina Green	6' Gas Flatbed - idle	12	G	0.17	N/A	30	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Alcatraz	6' Gas Flatbed - idle	12	G	0.17	N/A	18	3
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	18	3
	Pickup Truck - idle	250	G	0.17	N/A	18	2
	Pickup Truck - 5mph	250	G	N/A	0.25	18	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	18	10
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	18	10
Cavallo Point	6' Gas Flatbed - idle	12	G	0.17	N/A	30	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Crissy Field	6' Gas Flatbed - idle	12	G	0.17	N/A	30	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	2
	Pickup Truck - idle	250	G	0.17	N/A	30	2
	Pickup Truck - 5mph	250	G	N/A	0.25	30	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Fort Mason	6' Gas Flatbed - idle	12	G	0.17	N/A	30	1
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	30	1
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	75
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	75

Table X-X. 2013 AC34 On-Road Sources Activity Data Summary

Location	Activity/Component	HP	Fuel Type	Hours/Day/ Unit	Miles/Trip/ Units	# Days	# Units
AC Village: Marina Green	6' Gas Flatbed - idle	12	G	0.17	N/A	71	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	71	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	500
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	500
Alcatraz	6' Gas Flatbed - idle	12	G	0.17	N/A	18	3
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	18	3
	Pickup Truck - idle	250	G	0.17	N/A	18	2
	Pickup Truck - 5mph	250	G	N/A	0.25	18	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	200
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	200
Cavallo Point	6' Gas Flatbed - idle	12	G	0.17	N/A	12	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	12	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Crissy Field	6' Gas Flatbed - idle	12	G	0.17	N/A	21	2
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	21	2
	Pickup Truck - idle	250	G	0.17	N/A	21	2
	Pickup Truck - 5mph	250	G	N/A	0.25	21	2
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	500
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	500

Fort Mason	6' Gas Flatbed - idle	12	G	0.17	N/A	18	1
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	18	1
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	150
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	150
Pier 19 and 19½	6' Gas Flatbed - idle	12	G	0.17	N/A	81	4
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	4
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Pier 23	6' Gas Flatbed - idle	12	G	0.17	N/A	81	4
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	4
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	300
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	300
Pier 30-32	6' Gas Flatbed - idle	12	G	0.17	N/A	81	8
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	8
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	600
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	600
Piers 27-29 and Pier 29½	6' Gas Flatbed - idle	12	G	0.17	N/A	81	3
	6' Gas Flatbed - 5mph	12	G	N/A	0.25	81	3
	26' Bobtail Truck - idle	450	D	0.17	N/A	1	600
	26' Bobtail Truck - 5mph	450	D	N/A	0.25	1	600

On-Road Spectator Traffic

Table X-X. 2012 AC34 On-Road Spectator Traffic Activity Data Summary

Location	Activity/Component	Fuel Type	Miles/Trip	# Days	Trips/Day
San Francisco Origin	Light Duty Passenger Cars	G	5	20	1,995
East Bay Origin	Light Duty Passenger Cars	G	11.5	20	9,452
North Bay Origin	Light Duty Passenger Cars	G	54.2	20	5,864
South Bay Origin	Light Duty Passenger Cars	G	50	20	10,165
Out fo Region Origin	Light Duty Passenger Cars	G	62.4	20	1,282

Table X-X. 2013 AC34 On-Road Spectator Traffic Activity Data Summary

Location	Activity/Component	Fuel Type	Miles/Trip	# Days	Trips/Day
San Francisco Origin	Light Duty Passenger Cars	G	5	50	2,132
East Bay Origin	Light Duty Passenger Cars	G	11.5	50	10,051
North Bay Origin	Light Duty Passenger Cars	G	54.2	50	6,451
South Bay Origin	Light Duty Passenger Cars	G	50	50	10,846
Out fo Region Origin	Light Duty Passenger Cars	G	62.4	50	1,325

Table X-X. 2012 Emission Factors for AC34 Race Operation

Activities/ Components	HP / Truck Type	Fuel Type	Source of EF ¹	EF Unit														
					ROGexh-D	ROGexh-G	ROGevp	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
On-Water Sources																		
spect_boats - main	1000	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
spect_boats - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
race_vessels - gas	279	G	OFFROAD	g/hp-hr	0.00	9.96	13.89	273.47	7.83	0.01	0.10	0.00	0.09	0.00	0.00	1071.96	0.54	0.48
race_vessels - dsl	722	D	HCR / OFFROAD ²	g/hp-hr	0.68	0.00	0.00	3.73	5.10	0.02	0.15	0.15	0.14	0.00	0.00	1767.90	0.88	0.00
assist_tug - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
motor_craft - gas	101	G	OFFROAD	g/hp-hr	0.00	43.21	19.67	168.59	7.36	0.02	5.78	0.00	5.32	0.00	0.00	1116.62	2.66	0.40
motor_craft - dsl	196	D	HCR / OFFROAD ²	g/hp-hr	0.68	0.00	0.00	3.73	5.10	0.02	0.15	0.15	0.14	0.00	0.00	1766.66	0.88	0.00
sailboats - gas	12.6	G	OFFROAD	g/hp-hr	0.00	48.89	342.08	259.42	8.20	0.02	5.37	0.00	4.94	0.00	0.00	1146.13	2.98	0.94
sailboats - dsl	37	D	OFFROAD	g/hp-hr	3.37	0.00	0.00	5.07	11.51	0.01	0.29	0.28	0.27	0.00	0.00	613.26	0.30	0.00
priv_lgvessels - main	3300	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
priv_lgvessels - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment																		
Generator 60kw/500A	105	D	OFFROAD	g/hp-hr	1.02	0.00	0.00	3.60	5.85	0.01	0.46	0.46	0.42	0.00	0.00	568.30	0.08	0.00
Generator-144KW/1200 AMps	252	D	OFFROAD	g/hp-hr	0.38	0.00	0.00	1.28	4.32	0.01	0.13	0.13	0.12	0.00	0.00	568.30	0.03	0.00
Generator Twin Pack400Twin	1072	D	OFFROAD	g/hp-hr	0.39	0.00	0.00	1.28	4.44	0.01	0.13	0.13	0.12	0.00	0.00	568.30	0.03	0.00
19' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32' scissor lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60' Boomlift	83	D	OFFROAD	g/hp-hr	1.04	0.00	0.00	3.99	5.45	0.01	0.50	0.50	0.46	0.00	0.00	568.30	0.08	0.00
5k Warehouse (forklift)	41	D	OFFROAD	g/hp-hr	2.31	0.00	0.00	6.48	5.75	0.01	0.52	0.52	0.48	0.00	0.00	568.30	0.18	0.00
10k Reach forklift	99	D	OFFROAD	g/hp-hr	1.04	0.00	0.00	3.99	5.45	0.01	0.50	0.50	0.46	0.00	0.00	568.30	0.08	0.00
Event 4000w Light Tower	12	D	OFFROAD	g/hp-hr	1.02	0.00	0.00	3.87	5.87	0.01	0.34	0.34	0.31	0.00	0.00	568.30	0.08	0.00
boat_lifts	200	D	OFFROAD	g/hp-hr	0.66	0.00	0.00	1.57	5.43	0.01	0.20	0.20	0.18	0.00	0.00	568.30	0.05	0.00
On-Road Trucks																		
6' Gas Flatbed - idle	LHD2	G	EMFAC	g/hr	0.00	21.85	0.00	138.68	1.48	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
6' Gas Flatbed - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.19	1.28	12.70	0.62	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
Pickup Truck - idle	LHD2	G	EMFAC	g/hr	0.00	21.85	0.00	138.68	1.48	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
Pickup Truck - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.19	1.28	12.70	0.62	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
26' Bobtail Truck - idle	HHD	D	EMFAC	g/hr	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72	0.00	0.00
26' Bobtail Truck - 5mph	HHD	D	EMFAC	g/mi	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36	0.00	0.00
On-Road Spectator Traffic																		
Private Auto	LDA	G	EMFAC	g/mi	0.00	0.06	0.03	1.88	0.19	0.00	0.01	0.00	0.01	0.00	0.01	371.03	0.00	0.00

Notes:

1. BPC: San Francisco Bay Area Seaports Air Emissions Inventory, 2005; OFFROAD: ARB OFFROAD 2007 Model; EMFAC: ARB EMFAC v2.3 Model; HCR: 2007 ARB Harbor Craft Rule
2. Diesel Race Support Vessel and Diesel Small Private Motor Craft Emissions Factors for ROG, CO, NOx, and PM are sourced from the 2007 ARB Harbor Craft Rule while other pollutant EFs are sourced from the ARB OFFROAD 2007 model
3. SOx emissions for diesel marine sources are calculated based on fuel consumption
4. Emissions from off-road equipment powered by electricity are not quantified in this analysis

Table X-X. 2013 Emission Factors for AC34 Race Operation

Activities/ Components	HP / Truck Type	Fuel Type	Source of EF ¹	EF Unit														
					ROGexh-D	ROGexh-G	ROGevp	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
On-Water Sources																		
spect_boats - main	1000	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
spect_boats - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
race_vessels - gas	287	G	OFFROAD	g/hp-hr	0.00	9.94	14.23	272.76	7.81	0.01	0.10	0.00	0.09	0.00	0.00	1068.14	0.54	0.48
race_vessels - dsl	722	D	HCR / OFFROAD ²	g/hp-hr	0.68	0.00	0.00	3.73	5.10	0.02	0.15	0.15	0.14	0.00	0.00	1771.91	0.88	0.00
assist_tug - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - main	1500	D	BPC	g/hp-hr	1.24	0.00	0.00	3.72	14.22	N/A ³	0.59	0.59	0.57	0.00	0.00	0.00	0.00	0.00
assist_tug_alcatraz - aux	111	D	BPC	g/hp-hr	2.10	0.00	0.00	5.59	13.47	N/A ³	0.72	0.72	0.70	0.00	0.00	0.00	0.00	0.00
motor_craft - gas	100	G	OFFROAD	g/hp-hr	0.00	40.26	19.37	162.75	7.23	0.02	5.84	0.00	5.37	0.00	0.00	1127.49	2.48	0.39
motor_craft - dsl	196	D	HCR / OFFROAD ²	g/hp-hr	0.68	0.00	0.00	3.73	5.10	0.02	0.15	0.15	0.14	0.00	0.00	1768.76	0.88	0.00
sailboats - gas	12.6	G	OFFROAD	g/hp-hr	0.00	46.23	341.95	257.13	8.27	0.02	5.40	0.00	4.97	0.00	0.00	1151.23	2.82	0.94
sailboats - dsl	37	D	OFFROAD	g/hp-hr	3.39	0.00	0.00	5.10	11.59	0.01	0.29	0.28	0.27	0.00	0.00	616.86	0.31	0.00
priv_lgvessels - main	3300	D	BPC	g/hp-hr	1.10	0.00	0.00	3.51	13.82	N/A ³	0.55	0.55	0.53	0.00	0.00	0.00	0.00	0.00
priv_lgvessels - aux	94	D	BPC	g/hp-hr	2.01	0.00	0.00	5.44	13.16	N/A ³	0.68	0.68	0.66	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment																		
Generator 60kw/500A	105	D	OFFROAD	g/hp-hr	0.93	0.00	0.00	3.57	5.48	0.01	0.42	0.42	0.39	0.00	0.00	568.30	0.07	0.00
Generator-144KW/1200 AMps	252	D	OFFROAD	g/hp-hr	0.36	0.00	0.00	1.21	3.99	0.01	0.11	0.11	0.11	0.00	0.00	568.30	0.03	0.00
Generator Twin Pack400Twin	1072	D	OFFROAD	g/hp-hr	0.37	0.00	0.00	1.21	4.11	0.01	0.12	0.12	0.11	0.00	0.00	568.30	0.03	0.00
19' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
32' scissor lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
43' Scissor Lift ⁴	N/A	E	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
60' Boomlift	83	D	OFFROAD	g/hp-hr	0.93	0.00	0.00	3.95	5.04	0.01	0.43	0.43	0.40	0.00	0.00	568.30	0.07	0.00
5k Warehouse (forklift)	41	D	OFFROAD	g/hp-hr	2.00	0.00	0.00	6.25	5.53	0.01	0.46	0.46	0.43	0.00	0.00	568.30	0.15	0.00
10k Reach forklift	99	D	OFFROAD	g/hp-hr	0.93	0.00	0.00	3.95	5.04	0.01	0.43	0.43	0.40	0.00	0.00	568.30	0.07	0.00
Event 4000w Light Tower	12	D	OFFROAD	g/hp-hr	0.97	0.00	0.00	3.80	5.62	0.01	0.32	0.32	0.29	0.00	0.00	568.30	0.07	0.00
boat_lifts	200	D	OFFROAD	g/hp-hr	0.62	0.00	0.00	1.49	5.04	0.01	0.18	0.18	0.16	0.00	0.00	568.30	0.05	0.00
On-Road Trucks																		
6' Gas Flatbed - idle	LHD2	G	EMFAC	g/hr	0.00	21.73	0.00	137.87	1.46	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
6' Gas Flatbed - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.04	1.20	11.05	0.56	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
Pickup Truck - idle	LHD2	G	EMFAC	g/hr	0.00	21.73	0.00	137.87	1.46	0.05	0.00	0.00	0.00	0.00	0.00	4776.90	0.00	0.00
Pickup Truck - 5mph	LHD2	G	EMFAC	g/mi	0.00	1.04	1.20	11.05	0.56	0.02	0.05	0.00	0.04	0.00	0.01	2513.51	0.00	0.00
26' Bobtail Truck - idle	HHD	D	EMFAC	g/hr	10.96	0.00	0.00	48.55	113.98	0.06	1.35	1.35	1.24	0.00	0.00	6541.71	0.00	0.00
26' Bobtail Truck - 5mph	HHD	D	EMFAC	g/mi	7.81	0.00	0.00	12.93	27.24	0.04	1.50	1.50	1.38	0.01	0.01	3845.36	0.00	0.00
On-Road Spectator Traffic																		
Private Auto	LDA	G	EMFAC	g/mi	0.00	0.04	0.03	1.60	0.16	0.00	0.01	0.00	0.01	0.00	0.01	369.93	0.00	0.00

Notes:

1. BPC: San Francisco Bay Area Seaports Air Emissions Inventory, 2005; OFFROAD: ARB OFFROAD 2007 Model; EMFAC: ARB EMFAC v2.3 Model; HCR: 2007 ARB Harbor Craft Rule
2. Diesel Race Support Vessel and Diesel Small Private Motor Craft Emissions Factors for ROG, CO, NOx, and PM are sourced from the 2007 ARB Harbor Craft Rule while other pollutant EFs are sourced from the ARB OFFROAD 2007 model
3. SOx emissions for diesel marine sources are calculated based on fuel consumption
4. Emissions from off-road equipment powered by electricity are not quantified in this analysis

In-Air Sources

Table X-X. 2012 AC34 Operation In-Air Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Barge Helipad & Regional Airports	556	21,936	400.63	95.93	0.00	0.00	0.00	0.00	0.00	234,258	0.00	0.00

10.97 TPY of CO

Table X-X. 2013 AC34 Operation In-Air Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Barge Helipad & Regional Airports	1,384	54,674	999	239.04	0.00	0.00	0.00	0.00	0.00	583,726	0.00	0.00

27.34 TPY of CO

Off-Road Equipment

Table X-X. 2012 AC34 Operation Off-Road Equipment Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village: Marina Green	193.78	633	2,020	2.58	65.42	65.42	60.19	0.00	0.00	254,050	14.87	0.00
AC34 Live Sites	103.33	336.35	1,158	1.49	33.77	33.77	31.07	0.00	0.00	148,709	7.93	0.00
Alcatraz	17.20	56.60	139.21	0.18	5.85	5.85	5.38	0.00	0.00	16,802	1.32	0.00
Cavallo Point	193.46	632	2,019	2.58	65.32	65.32	60.09	0.00	0.00	253,871	14.84	0.00
Crissy Field	110.64	362.28	1,192	1.54	36.43	36.43	33.51	0.00	0.00	152,132	8.49	0.00
Fort Mason	105.35	342.00	1,163	1.50	34.23	34.23	31.49	0.00	0.00	149,205	8.08	0.00
Pier 30-32	320.68	767	2,648	3.12	95.99	95.99	88.31	0.00	0.00	277,247	24.60	0.00
Pier 32-36 Open Water Basin	320.68	767	2,648	3.12	95.99	95.99	88.31	0.00	0.00	277,247	24.60	0.00
Pier 80	320.68	767	2,648	3.12	95.99	95.99	88.31	0.00	0.00	277,247	24.60	0.00

Total **4,663 lb/yr** **2.33 TPY of CO**

Table X-X. 2013 AC34 Operation Off-Road Equipment Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village: Marina Green	562	1,877	6,096	8.46	182.08	182.08	167.51	0.00	0.00	840,952	43.11	0.00
AC34 Live Sites	97.92	333.65	1,099	1.54	31.63	31.63	29.10	0.00	0.00	156,556	7.51	0.00
Alcatraz	145.25	495.09	1,440	1.97	50.00	50.00	46.00	0.00	0.00	192,532	11.14	0.00
Cavallo Point	491.10	1,649	5,165	7.12	163.42	163.42	150.35	0.00	0.00	701,790	37.67	0.00
Crissy Field	109.43	378.02	1,155	1.62	35.79	35.79	32.93	0.00	0.00	162,513	8.39	0.00
Fort Mason	100.53	341.83	1,106	1.55	32.23	32.23	29.66	0.00	0.00	157,299	7.71	0.00
Pier 19 and 19½	547	1,818	5,987	8.32	174.42	174.42	160.47	0.00	0.00	829,925	41.97	0.00
Pier 23	547	1,818	5,987	8.32	174.42	174.42	160.47	0.00	0.00	829,925	41.97	0.00
Pier 30-32	1,136	3,356	10,214	13.64	353.75	353.75	325.45	0.00	0.00	1,285,471	87.15	0.00
Pier 80	510	1,230	4,150	5.26	146.38	146.38	134.67	0.00	0.00	467,854	39.16	0.00
Piers 27-29 and Pier 29½	1,634	5,429	17,943	24.95	521	521	478.87	0.00	0.00	2,487,316	125.39	0.00

Total **18,725 lb/yr** **9.36 TPY of CO**

On-Road Trucks

Table X-X. 2012 AC34 Operation On-Road Trucks Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village: Marina Green	3.25	11.24	17.52	0.01	0.46	0.46	0.42	0.00	0.00	1,546	0.00	0.00
Alcatraz	2.46	9.87	10.56	0.01	0.28	0.27	0.25	0.00	0.00	1,097	0.00	0.00
Cavallo Point	3.25	11.24	17.52	0.01	0.46	0.46	0.42	0.00	0.00	1,546	0.00	0.00
Crissy Field	3.81	14.72	17.58	0.02	0.46	0.46	0.42	0.00	0.00	1,734	0.00	0.00
Fort Mason	0.95	3.68	4.39	0.00	0.11	0.11	0.11	0.00	0.00	433.50	0.00	0.00
Total	50.75 lb/yr			0.03 TPY of CO								

Table X-X. 2013 AC34 Operation On-Road Trucks Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village: Marina Green	5.48	20.54	28.57	0.03	0.66	0.66	0.61	0.00	0.00	2,708	0.00	0.00
Alcatraz	2.50	10.10	11.46	0.01	0.27	0.26	0.25	0.00	0.00	1,187	0.00	0.00
Cavallo Point	2.72	8.85	17.09	0.01	0.40	0.40	0.37	0.00	0.00	1,432	0.00	0.00
Crissy Field	4.94	17.25	28.52	0.02	0.66	0.66	0.61	0.00	0.00	2,526	0.00	0.00
Fort Mason	1.42	4.77	8.55	0.01	0.20	0.20	0.18	0.00	0.00	735	0.00	0.00
Pier 19 and 19½	5.49	25.88	17.34	0.02	0.40	0.40	0.37	0.00	0.00	2,375	0.00	0.00
Pier 23	5.49	25.88	17.34	0.02	0.40	0.40	0.37	0.00	0.00	2,375	0.00	0.00
Pier 30-32	10.97	51.76	34.69	0.05	0.81	0.79	0.74	0.00	0.01	4,749	0.00	0.00
Piers 27-29 and Pier 29½	7.24	28.77	34.35	0.03	0.80	0.79	0.73	0.00	0.00	3,477	0.00	0.00
Total	193.80 lb/yr			0.10 TPY of CO								

On-Water Sources

Table X-X. 2012 AC34 Operation On-Water Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
AC Village: Marina Green	4,066	37,898	13,177	8.03	504	490.54	487.42	0.00	0.00	292,619	146.18	60.61
Alcatraz	13.22	39.46	147.22	0.06	6.16	6.16	5.98	0.00	0.00	0.00	0.00	0.00
Barge Helipad & Regional Airports	4.41	13.15	49.07	0.02	2.05	2.05	1.99	0.00	0.00	0.00	0.00	0.00
Fort Mason	1,532	17,382	720	1.66	13.14	6.49	12.09	0.00	0.00	146,309	73.09	30.31
Pier 30-32	15,316	173,819	7,204	16.65	131.41	64.87	120.90	0.00	0.00	1,463,093	731	303.06
Pier 80	1,532	17,382	720	1.66	13.14	6.49	12.09	0.00	0.00	146,309	73.09	30.31
Spectator Vessels	15,789	25,057	1,387	2.67	786	8.96	723	0.00	0.00	172,063	378.33	65.97
Total	271,591 lb/yr			135.80 TPY of CO								

Table X-X. 2013 AC34 Operation On-Water Sources Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Alcatraz	13.22	39.46	147.22	0.06	6.16	6.16	5.98	0.00	0.00	0.00	0.00	0.00
Barge Helipad & Regional Airports	4.41	13.15	49.07	0.02	2.05	2.05	1.99	0.00	0.00	0.00	0.00	0.00
Piers 14-22.5 Open Water Basin	3,665	11,321	41,233	16.56	1,701	1,701	1,650	0.00	0.00	0.00	0.00	0.00
Fort Mason	4,288	45,532	5,120	5.53	169.28	152.22	162.54	0.00	0.00	370,634	185.33	77.80
Pier 9	590	1,816	6,570	2.64	272.01	272.01	263.85	0.00	0.00	0.00	0.00	0.00
Pier 19 and 19½	17,233	190,253	11,280	16.81	291.08	219.21	276.32	0.00	0.00	1,328,304	665	330.67
Pier 23	26,480	291,257	18,889	25.20	516	405.99	491.41	0.00	0.00	1,915,339	960	506

Table X-X. 2013 AC34 Operation On-Water Sources Emissions [lb/yr] (continued)

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
Pier 26 and 28	16,875	189,133	7,088	15.13	120.52	48.66	110.88	0.00	0.00	1,328,304	665	330.67
Pier 30-32	33,749	378,267	14,176	30.27	241.04	97.31	221.76	0.00	0.00	2,656,607	1,330	661
Pier 80	3,993	44,624	1,835	4.21	33.28	16.22	30.61	0.00	0.00	370,634	185.33	77.80
Piers 27-29 and Pier 29½	10,965	66,147	80,109	35.65	3,265	3,248	3,165	0.00	0.00	370,634	185.33	77.80
Spectator Vessels	56,044	89,122	5,071	9.88	2,910	33.97	2,677	0.00	0.00	637,394	1,297	239.63
Total	1,307,527 lb/yr			654 TPY of CO								

On-Road Spectator Traffic

Table X-X. 2012 AC34 Operation On-Road Spectator Traffic Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
San Francisco	40.12	825	81.46	1.57	4.56	0.00	4.13	0.88	2.20	163,157	0.00	0.00
East Bay	437.29	8,992	888	17.15	49.74	0.00	45.01	9.59	23.96	1,778,304	0.00	0.00
North Bay	1,279	26,291	2,596	50.14	145.44	0.00	131.59	28.03	70.07	5,199,361	0.00	0.00
South Bay	2,045	42,044	4,151	80.19	232.58	0.00	210.44	44.82	112.05	8,314,783	0.00	0.00
Out of Region	321.86	6,618	653	12.62	36.61	0.00	33.13	7.06	17.64	1,308,868	0.00	0.00
Total	84,770 lb/yr			42.38 TPY of CO								

Table X-X. 2013 AC34 Operation On-Road Spectator Traffic Emissions [lb/yr]

Location	ROG	CO	NOx	SOx	PM10	DPM	PM2.5	PMtire	PMbrk	CO2	CH4	N2O
San Francisco	88.94	1,876	188.08	4.20	12.15	0.00	11.00	2.35	5.88	434,722	0.00	0.00
East Bay	964	20,338	2,039	45.53	131.76	0.00	119.26	25.48	63.71	4,713,564	0.00	0.00
North Bay	2,917	61,523	6,169	137.73	398.59	0.00	360.76	77.09	192.72	14,258,542	0.00	0.00
South Bay	4,524	95,418	9,567	213.61	618	0.00	560	119.56	298.89	22,114,176	0.00	0.00
Out of Region	690	14,544	1,458	32.56	94.23	0.00	85.29	18.22	45.56	3,370,804	0.00	0.00
Total	193,699 lb/yr			96.85 TPY of CO								

CO Totals for NEPA =

2012 = 383,011 lb/yr = 191.51 TPY of CO
 2013 = 1,574,819 lb/yr = 787 TPY of CO

GENERAL CONSTRUCTION EMISSIONS

AC34 Construction Emissions for NEPA Analysis/ General Conformity

Emission Estimates from ACER DEIR Appendix 3a (page 15 of pdf).

Source	Year	Emissions in tons per year			
		ROG	Nox	PM2.5	CO
Construction Equipment	2012	0.21	0.84	0.06	0.66
	2013	0.44	2.25	0.13	1.47
Trucks	2012	0.01	0.17	0.01	0.09
	2013	0	0.3	0	0.2
Water Sources	2012	0.09	1.01	0.04	0.27
	2013	1.3	13	0.6	4
Total Construction Emissions 2012 =		0.31	2.02	0.11	1.02
Total Construction Emissions 2013 =		1.74	15.55	0.73	5.67

CONSTRUCTION EQUIPMENT ACTIVITY DATA SUMMARY

CONSTRUCTION EQUIPMENT

2012 AC34 Construction Equipment Activity Data Summary

Location	Activity/Components	Equipment Type	Equipment Count	HP	Fuel Type	Duration (days)	Operating Hours per Day
Pier 30-32	Demolition of bldg	Hoe-ram	1	180	D	5	6.0
		Backhoe /loader	2	180	D	5	6.0
		Portable generators & jack hammers	2	80	D	5	5.0
Pier 80	Installation of floating docks/piles	Mobil Crane	1	300	D	5	5.0
		Vibratory Pile Driver	1	100	D	2	8.0
Pier 80	Removal of floating docks/piles	Mobil Cranes	1	300	D	2	8.0
Pier 80	Installation of team base	Boomlift	1	83	D	60	10.0
		5k Warehouse lift	8	41	D	60	10.0
		10k Reach forklift	4	99	D	60	10.0
		Event 4000w Light Tower	4	12	D	60	10.0
AC Village	Installation of floating docks/piles	Mobil Crane	1	300	D	3	5.0
		Vibratory Pile Driver	1	100	D	2	8.0
AC Village	Removal of floating docks/piles	Mobil Cranes	1	300	D	3	8.0
Fort Mason	Installation of Piles to Support Communication Barge	Mobil Crane	1	300	D	5	5.0
		Vibratory Pile Driver	1	100	D	2	8.0

2013 AC34 Construction Equipment Activity Data Summary

Location	Activity/Components	Equipment Type	Equipment Count	HP	Fuel Type	Duration (days)	Operating Hours per Day
Pier 1	Installation of floating docks/piles	Mobil Crane	1	300	D	2	5.0
		Vibratory Pile Driver	1	100	D	1	8.0
Pier 1	Removal of floating docks/piles	Mobil Cranes	1	300	D	1	8.0
Pier 9-15 Water Basin	Installation of floating docks/piles	Mobil Crane	1	300	D	2	5.0
		Vibratory Pile Driver	1	100	D	1	8.0
Pier 9-15 Water Basin	Removal of floating docks/piles	Mobil Cranes	1	300	D	1	8.0
Pier 17-19	Installation of floating docks/piles	Mobil Crane	1	300	D	2	5.0
		Vibratory Pile Driver	1	100	D	1	8.0
Pier 17-19	Removal of floating docks/piles	Mobil Cranes	1	300	D	1	8.0
Pier 23	Installation of floating docks/piles	Mobil Crane	1	300	D	8	5.0
		Vibratory Pile Driver	1	100	D	3	8.0
Pier 23	Installation of Piles to Support Communication Barge	Mobil Crane	1	300	D	5	5.0
		Vibratory Pile Driver	1	100	D	2	8.0
Pier 23	Removal of floating docks/piles	Mobil Cranes	1	300	D	4	8.0

CONSTRUCTION EQUIPMENT

Pier 23	Removal of Piles to Support Communication Barge	Mobil Cranes	1	300	D	2	8.0
Pier 26-28	Installation of floating docks/piles	Mobil Crane	1	300	D	12	5.0
		Vibratory Pile Driver	1	100	D	5	8.0
Pier 26-28	Removal of floating docks/piles	Mobil Cranes	1	300	D	6	8.0
Pier 26-28	Dredging	Bucket dredge	1	1300	D	1	8.0
Pier 27-29	Installation of floating docks/piles	Mobil Crane	1	300	D	12	5.0
		Vibratory Pile Driver	1	100	D	5	8.0
Pier 27-29	Installation of mooring anchorings	Mobil Crane	1	300	D	11	5.0
		Vibratory Pile Driver	1	100	D	5	8.0
Pier 27-29	Removal of floating docks/piles	Mobil Cranes	1	300	D	6	8.0
Pier 27-29	Removal of mooring anchorings	Mobil Cranes	1	300	D	5	8.0
Pier 30-32	Installation of floating docks/wave attenuators/piles	Mobil Crane	1	300	D	17	5.0
		Vibratory Pile Driver	1	100	D	7	8.0
Pier 30-32	Removal of floating docks/wave attenuators/piles	Mobil Cranes	1	300	D	9	8.0
Pier 30-32	Pile Driving	Portable generators	2	80	D	44	5.0
		Welding machines	2	40	D	44	5.0
Pier 30-32	Installation of team base	Boomlift	1	83	D	60	10
		5k Warehouse lift	8	41	D	60	10
		10k Reach forklift	4	99	D	60	10
		Event 4000w Light Tower	4	12	D	60	10
Pier 30-32	Removal of team base	Boomlift	1	83	D	21	10
		5k Warehouse lift	8	41	D	21	10
		10k Reach forklift	4	99	D	21	10
		Event 4000w Light Tower	4	12	D	21	10
Pier 32-36	Installation of wave attenuators/piles	Mobil Crane	1	300	D	4	5.0
		Vibratory Pile Driver	1	100	D	2	8.0
Pier 32-36	Installation of mooring anchorings	Mobil Crane	1	300	D	3	5.0
		Vibratory Pile Driver	1	100	D	1	8.0
Pier 32-36	Removal of wave attenuators/piles	Mobil Cranes	1	300	D	2	8.0
Pier 32-36	Removal of mooring anchorings	Mobil Cranes	1	300	D	1	8.0
Pier 32-36	Dredging	Bucket dredge	1	1300	D	30	8.0
Pier 41-45 Water Basin	Installation of floating docks/piles	Mobil Crane	1	300	D	2	5.0
		Vibratory Pile Driver	1	100	D	1	8.0
Pier 41-45 Water Basin	Removal of floating docks/piles	Mobil Cranes	1	300	D	1	8.0
Pier 48 South/ China Basin	Installation of floating docks/piles	Mobil Crane	1	300	D	2	5.0
		Vibratory Pile Driver	1	100	D	1	8.0
Pier 48 South/ China Basin	Removal of floating docks/piles	Mobil Cranes	1	300	D	1	8.0

CONSTRUCTION EQUIPMENT

		Boomlift	1	83	D	21	10
		5k Warehouse lift	8	41	D	21	10
		10k Reach forklift	4	99	D	21	10
Pier 80	Removal of team base	Event 4000w Light Tower	4	12	D	21	10
Pier 80	Removal of floating docks/piles	Mobil Cranes	1	300	D	1	8.0
Fort Mason	Installation of floating docks/piles	Mobil Crane	1	300	D	4	5.0
		Vibratory Pile Driver	1	100	D	2	8.0
Fort Mason	Removal of Piles to Support Communication Barge	Mobil Cranes	1	300	D	2	8.0
Fort Mason	Removal of floating docks/piles	Mobil Cranes	1	300	D	2	8.0

ON-ROAD TRUCKS

2012 AC34 Trucks Activity Data Summary

Location	Activity/Components	Category	Truck Type (LT/MD/HVY)	Fuel type	Total one-way trips per day	Duration (days)	Total Idling hours per day	Operating hours per day (hr/day/truck)	On-site distance per one-way trip (mi/one-way trip)	Off-site distance per one-way trip (mi/one-way trip)	On-site speed (mph)	Off-site speed (mph)
Pier 30-32	Demolition of bldg	Dump trucks	HHH	D	4	5	0.7	8.0	0.25	20	5	45
		pickups	LDT2	G	12	5	2.0	4.0	0.25	20	5	45
		Flatbed Truck	HHH	D	5	2	0.8	5.0	0.25	20	5	45
Pier 80	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	5	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	5	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHH	D	2	2	0.3	5.0	0.25	20	5	45
Pier 80	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	2	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHH	D	1	2	0.2	5.0	0.25	20	5	45
Pier 80	Installation of team base	6' Gas Flatbed	LDT2	G	8	60	1.3	5.0	0.25	20	5	45
		26' Bobtail Truck	HHH	D	8	60	1.3	5.0	0.25	20	5	45
		Flatbed Truck (HDT)	HHH	D	23	2	3.8	5.0	0.25	20	5	45
AC Village	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	3	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	3	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHH	D	2	2	0.3	5.0	0.25	20	5	45
AC Village	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	3	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	3	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHH	D	1	2	0.2	5.0	0.25	20	5	45
Fort Mason	Installation of Piles to Support Communication Barge	Flatbed Truck	HHH	D	2	2	0.3	5.0	0.25	20	5	45

2013 AC34 Trucks Activity Data Summary

Location	Activity/Components	Category	Truck Type (LT/MD/HVY)	Fuel type	Total one-way trips per day	Duration (days)	Total Idling hours per day	Operating hours per day (hr/day/truck)	On-site distance per one-way trip (mi/one-way trip)	Off-site distance per one-way trip (mi/one-way trip)	On-site speed (mph)	Off-site speed (mph)
Pier 1	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	2	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHH	D	2	2	0.3	5.0	0.25	20	5	45
Pier 1	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHH	D	1	2	0.2	5.0	0.25	20	5	45
Pier 9-15 Water Basin	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	2	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHH	D	2	2	0.3	5.0	0.25	20	5	45
Pier 9-15 Water Basin	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHH	D	1	2	0.2	5.0	0.25	20	5	45
Pier 17-19	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	2	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHH	D	2	2	0.3	5.0	0.25	20	5	45
Pier 17-19	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHH	D	1	2	0.2	5.0	0.25	20	5	45

ON-ROAD TRUCKS

Pier 23	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	8	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	8	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
Pier 23	Installation of Piles to Support Communication Barge	Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
Pier 23	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	4	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	4	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
Pier 23	Removal of Piles to Support Communication Barge	Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	2	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
Pier 26-28	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	12	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	12	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
Pier 26-28	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	6	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	6	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
Pier 26-28	Dredging (Pier 32-36)	pickups	LDT2	G	12	1	2.0	2.0	0.25	20	5	45
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
Pier 27-29	Installation of floating docks/piles	Pickup Trucks	LDT2	G	12	12	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	12	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
Pier 27-29	Installation of mooring anchorings	Flatbed Truck	HHD	D	4	2	0.7	6.0	0.25	20	5	45
Pier 27-29	Removal of floating docks/piles	Pickup Trucks	LDT2	G	12	6	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	6	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
Pier 27-29	Removal of mooring anchorings	Pickup Trucks	LDT2	G	12	5	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	5	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	5	0.2	5.0	0.25	20	5	45
Pier 30-32	Installation of floating docks/wave attenuators/piles	Pickup Trucks	LDT2	G	12	17	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	17	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
Pier 30-32	Removal of floating docks/wave attenuators/piles	Pickup Trucks	LDT2	G	12	9	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	9	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
Pier 30-32	Pile Driving	pickups	LDT2	G	12	44	2.0	4.0	0.25	20	5	45
		Flatbed Truck	HHD	D	4	2	0.7	5.0	0.25	20	5	45
Pier 30-32	Installation of team base	6' Gas Flatbed	LDT2	G	8	60	1.3	5.0	0.25	20	5	45
		26' Bobtail Truck	HHD	D	8	60	1.3	5.0	0.25	20	5	45
		Flatbed Truck	HHD	D	23	2	3.8	5.0	0.25	20	5	45
Pier 30-32	Removal of team base	6' Gas Flatbed	LDT2	G	8	21	1.3	5.0	0.25	20	5	45
		26' Bobtail Truck	HHD	D	8	21	1.3	5.0	0.25	20	5	45
		Flatbed Truck	HHD	D	23	2	3.8	5.0	0.25	20	5	45
Pier 32-36	Installation of wave attenuators/piles	Pickup Trucks	LDT2	G	12	4	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	4	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
Pier 32-36	Installation of mooring anchorings	Flatbed Truck	HHD	D	4	2	0.7	5.0	0.25	20	5	45
Pier 32-36	Removal of wave attenuators/piles	Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	2	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45

ON-ROAD TRUCKS

Pier 32-36	Removal of mooring anchorings	Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
		Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	1	0.2	5.0	0.25	20	5	45
Pier 32-36	Dredging	pickups	LDT2	G	12	30	2.0	2.0	0.25	20	5	45
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
Pier 41-45 Water Basin	Installation of floating docks/piles	Flatbed Truck	MHD	D	2	2	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
Pier 41-45 Water Basin	Removal of floating docks/piles	Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
Pier 48 South/ China Basin	Installation of floating docks/piles	Flatbed Truck	MHD	D	2	2	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
Pier 48 South/ China Basin	Removal of floating docks/piles	Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	1	2.0	5.0	0.25	20	5	45
Pier 80	Removal of floating docks/piles	Flatbed Truck	MHD	D	2	1	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
		6' Gas Flatbed	LDT2	G	8	21	1.3	5.0	0.25	20	5	45
Pier 80	Removal of team base	26' Bobtail Truck	HHD	D	8	21	1.3	5.0	0.25	20	5	45
		Flatbed Truck	HHD	D	23	2	3.8	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	4	2.0	5.0	0.25	20	5	45
Fort Mason	Installation of floating docks/piles	Flatbed Truck	MHD	D	2	4	0.3	5.0	0.25	20	5	42
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
Fort Mason	Removal of Piles to Support Communication Barge	Flatbed Truck	MHD	D	2	2	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45
		Pickup Trucks	LDT2	G	12	2	2.0	5.0	0.25	20	5	45
Fort Mason	Removal of floating docks/piles	Flatbed Truck	MHD	D	2	2	0.3	6.0	0.25	20	5	42
		Flatbed Truck	HHD	D	1	2	0.2	5.0	0.25	20	5	45

WATER SOURCES

2012 AC34 Water Sources Activity Data Summary

Location	Activity/Components	Type	Equipment Count	HP	LF	Fuel Type	Duration (days)	Operating hours per day per boat
Pier 80	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	4	2.0
		Tug Boat - Aux	1	111	0.3	D	4	2.0
		Tug Boat - Main	1	1500	0.5	D	4	5.0
		Tug Boat - Aux	1	111	0.3	D	4	5.0
Pier 80	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
AC Village	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	3	2.0
		Tug Boat - Aux	1	111	0.3	D	3	2.0
		Tug Boat - Main	1	1500	0.5	D	3	5.0
		Tug Boat - Aux	1	111	0.3	D	3	5.0
AC Village	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	3	5.0
		Tug Boat - Aux	1	111	0.3	D	3	5.0
Fort Mason	Installation of Piles to Support Communication Barge	Tug Boat - Main	1	1500	0.5	D	4	2.0
		Tug Boat - Aux	1	111	0.3	D	4	2.0

2013 AC34 Water Sources Activity Data Summary

Year	Activity/Components	Equipment Type	Equipment Count	HP	LF	Fuel Type	Duration (days)	Operating hours per day per boat
Pier 1	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	2.0
		Tug Boat - Aux	1	111	0.3	D	2	2.0
		Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Pier 1	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0
Pier 9-15 Water Basin	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	2.0
		Tug Boat - Aux	1	111	0.3	D	2	2.0
		Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Pier 9-15 Water Basin	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0
Pier 17-19	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	2.0
		Tug Boat - Aux	1	111	0.3	D	2	2.0
		Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Pier 17-19	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0

WATER SOURCES

Pier 23	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	6	2.0
		Tug Boat - Aux	1	111	0.3	D	6	2.0
		Tug Boat - Main	1	1500	0.5	D	6	5.0
		Tug Boat - Aux	1	111	0.3	D	6	5.0
Pier 23	Installation of Piles to Support Communication Barge	Tug Boat - Main	1	1500	0.5	D	4	2.0
		Tug Boat - Aux	1	111	0.3	D	4	2.0
Pier 23	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	4	5.0
		Tug Boat - Aux	1	111	0.3	D	4	5.0
Pier 23	Removal of Piles to Support Communication Barge	Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Pier 26-28	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	10	2.0
		Tug Boat - Aux	1	111	0.3	D	10	2.0
		Tug Boat - Main	1	1500	0.5	D	10	5.0
		Tug Boat - Aux	1	111	0.3	D	10	5.0
Pier 26-28	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	6	5.0
		Tug Boat - Aux	1	111	0.3	D	6	5.0
Pier 26-28	Dredging	Bottom dump skows - Main	3	275	0.5	D	1	2.0
		Bottom dump skows - Aux	3	111	0.3	D	1	2.0
		Tugs (ocean going) - Main	1	2500	0.3	D	1	2.0
		Tugs (ocean going) - Aux	1	110	0.4	D	1	2.0
		Tugs (ocean going) - Main	1	2500	0.3	D	1	6.0
		Tugs (ocean going) - Aux	1	110	0.4	D	1	6.0
		Service boat - Main	1	500	0.5	D	1	3.0
		Service boat - Aux	1	111	0.3	D	1	3.0
Pier 27-29	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	10	2.0
		Tug Boat - Aux	1	111	0.3	D	10	2.0
		Tug Boat - Main	1	1500	0.5	D	10	5.0
		Tug Boat - Aux	1	111	0.3	D	10	5.0
Pier 27-29	Installation of mooring anchorings	Tug Boat - Main	1	1500	0.5	D	9	2.0
		Tug Boat - Aux	1	111	0.3	D	9	2.0
Pier 27-29	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	6	5.0
		Tug Boat - Aux	1	111	0.3	D	6	5.0
Pier 27-29	Removal of mooring anchorings	Tug Boat - Main	1	1500	0.5	D	5	5.0
		Tug Boat - Aux	1	111	0.3	D	5	5.0
Pier 30-32	Installation of floating docks/wave attenuators/piles	Tug Boat - Main	1	1500	0.5	D	14	2.0
		Tug Boat - Aux	1	111	0.3	D	14	2.0
		Tug Boat - Main	1	1500	0.5	D	14	5.0
		Tug Boat - Aux	1	111	0.3	D	14	5.0
Pier 30-32	Removal of floating docks/wave attenuators/piles	Tug Boat - Main	1	1500	0.5	D	9	5.0
		Tug Boat - Aux	1	111	0.3	D	9	5.0

WATER SOURCES

Pier 30-32	Pile Driving	Support tug - Main	1	1500	0.5	D	30	5.0
		Support tug - Aux	1	111	0.3	D	30	5.0
		Service boat - Main	1	1500	0.5	D	44	3.0
		Service boat - Aux	1	111	0.3	D	44	3.0
Pier 32-36	Installation of wave attenuators/piles	Tug Boat - Main	1	1500	0.5	D	4	2.0
		Tug Boat - Aux	1	111	0.3	D	4	2.0
		Tug Boat - Main	1	1500	0.5	D	3	5.0
		Tug Boat - Aux	1	111	0.3	D	3	5.0
Pier 32-36	Installation of mooring anchorings	Tug Boat - Main	1	1500	0.5	D	2	2.0
		Tug Boat - Aux	1	111	0.3	D	2	2.0
Pier 32-36	Removal of wave attenuators/piles	Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Pier 32-36	Removal of mooring anchorings	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0
Pier 32-36	Dredging	Bottom dump skows - Main	3	275	0.5	D	30	2.0
		Bottom dump skows - Aux	3	111	0.3	D	30	2.0
		Tugs (ocean going) - Main	1	2500	0.3	D	30	2.0
		Tugs (ocean going) - Aux	1	110	0.4	D	30	2.0
		Tugs (ocean going) - Main	1	2500	0.3	D	30	6.0
		Tugs (ocean going) - Aux	1	110	0.4	D	30	6.0
		Service boat - Main	1	500	0.5	D	30	3.0
		Service boat - Aux	1	111	0.3	D	30	3.0
Pier 41-45 Water Basin	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0
Pier 48 South/China Basin	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0
Pier 80	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	1	5.0
		Tug Boat - Aux	1	111	0.3	D	1	5.0
Pier 41-45 Water Basin	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	2.0
		Tug Boat - Aux	1	111	0.3	D	2	2.0
		Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Pier 48 South/China Basin	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	2.0
		Tug Boat - Aux	1	111	0.3	D	2	2.0
		Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Fort Mason	Installation of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	3	2.0
		Tug Boat - Aux	1	111	0.3	D	3	2.0
		Tug Boat - Main	1	1500	0.5	D	3	5.0
		Tug Boat - Aux	1	111	0.3	D	3	5.0

WATER SOURCES

Fort Mason	Removal of Piles to Support Communication Barge	Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0
Fort Mason	Removal of floating docks/piles	Tug Boat - Main	1	1500	0.5	D	2	5.0
		Tug Boat - Aux	1	111	0.3	D	2	5.0

CONSTRUCTION EQUIPMENT

2012 AC34 Construction Equipment Emissions Factors

Equipment Type	HP	Fuel Type	Emissions Factors (g/bhp-hr)									N2O	CO2
			ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4			
Hoe-ram	180	D	0.49	1.24	4.24	0.01	0.14	0.14	0.13	0.04	0.00	568.30	
Backhoe /loader	180	D	0.49	1.24	4.24	0.01	0.14	0.14	0.13	0.04	0.00	568.30	
Portable generators & jack hammers	80	D	1.24	4.10	6.22	0.01	0.59	0.59	0.54	0.10	0.00	568.30	
Mobil Crane	300	D	0.61	1.80	4.84	0.01	0.18	0.18	0.17	0.05	0.00	568.30	
Vibratory Pile Driver	100	D	1.31	4.14	6.62	0.01	0.60	0.60	0.56	0.10	0.00	568.30	
Boomlift	83	D	1.31	4.14	6.62	0.01	0.60	0.60	0.56	0.10	0.00	568.30	
5k Warehouse lift	41	D	2.31	6.48	5.75	0.01	0.52	0.52	0.48	0.18	0.00	568.30	
10k Reach forklift	99	D	1.04	3.99	5.45	0.01	0.50	0.50	0.46	0.08	0.00	568.30	
Event 4000w Light Tower	12	D	1.02	3.87	5.87	0.01	0.34	0.34	0.31	0.08	0.00	568.30	

Note: Construction equipment emission factors were calculated from OFFROAD2007.

2013 AC34 Construction Equipment Emissions Factors

Equipment Type	HP	Fuel Type	Emissions Factors (g/bhp-hr)									N2O	CO2
			ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4			
Mobil Crane	300	D	0.58	1.67	4.49	0.01	0.16	0.16	0.15	0.04	0.00	568.30	
Vibratory Pile Driver	100	D	1.22	4.10	6.24	0.01	0.56	0.56	0.51	0.09	0.00	568.30	
Bucket dredge	1300	D	0.49	1.39	4.43	0.01	0.15	0.15	0.14	0.04	0.00	568.30	
Portable generators	80	D	0.93	3.57	5.48	0.01	0.42	0.42	0.39	0.07	0.00	568.30	
Welding machines	40	D	2.47	5.97	5.53	0.01	0.52	0.52	0.48	0.19	0.00	568.30	
Boomlift	83	D	1.22	4.10	6.24	0.01	0.56	0.56	0.51	0.09	0.00	568.30	
5k Warehouse lift	41	D	2.00	6.25	5.53	0.01	0.46	0.46	0.43	0.15	0.00	568.30	
10k Reach forklift	99	D	0.93	3.95	5.04	0.01	0.43	0.43	0.40	0.07	0.00	568.30	
Event 4000w Light Tower	12	D	0.97	3.80	5.62	0.01	0.32	0.32	0.29	0.07	0.00	568.30	

Note: Construction equipment emission factors were calculated from OFFROAD2007.

TRUCKS

2012 AC34 Trucks Emissions Factors - Idling

Category	Truck Type (LT/MD/HVY)	Fuel type	Idling Emissions Factors (g/hr)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Dump trucks	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Flatbed Truck	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Pickup Trucks	LDT2	G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flatbed Truck	MHD	D	3.17	0.00	0.00	26.30	75.05	0.04	0.93	0.93	0.86	0.00	0.00	4098.00
6' Gas Flatbed	LDT2	G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26' Bobtail Truck	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72

2012 AC34 Trucks Emissions Factors - On-site Moving at 5 mph

Category	Truck Type (LT/MD/HVY)	Fuel type	On-Site Moving Emissions Factors (g/mi)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Dump trucks	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Flatbed Truck	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Pickup Trucks	LDT2	G	0.00	0.37	0.51	5.15	0.58	0.01	0.12	0.00	0.11	0.00	0.01	1189.04
Flatbed Truck	MHD	D	0.53	0.00	0.00	6.79	10.40	0.01	0.63	0.63	0.58	0.00	0.01	1505.00
6' Gas Flatbed	LDT2	G	0.00	0.37	0.51	5.15	0.58	0.01	0.12	0.00	0.11	0.00	0.01	1189.04
26' Bobtail Truck	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36

2012 AC34 Trucks Emissions Factors - Off-site Moving at Composite Speed

Category	Truck Type (LT/MD/HVY)	Fuel type	Off-Site Moving Emissions Factors (g/mi)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Dump trucks	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Flatbed Truck	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Pickup Trucks	LDT2	G	0.00	0.08	0.05	2.65	0.36	0.00	0.02	0.00	0.02	0.00	0.00	464.39
Flatbed Truck	MHD	D	0.15	0.00	0.00	1.49	7.09	0.01	0.18	0.18	0.16	0.00	0.00	1379.58
6' Gas Flatbed	LDT2	G	0.00	0.08	0.05	2.65	0.36	0.00	0.02	0.00	0.02	0.00	0.00	464.39
26' Bobtail Truck	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49

Note: Trucks emission factors from EMFAC2007

2013 AC34 Trucks Emissions Factors - Idling

Category	Truck Type (LT/MD/HVY)	Fuel type	Idling Emissions Factors (g/hr)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pickup Trucks	LDT2	G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Flatbed Truck	MHD	D	3.17	0.00	0.00	26.30	75.05	0.04	0.92	0.92	0.84	0.00	0.00	4098.00
Flatbed Truck	HHD	D	10.96	0.00	0.00	48.55	113.98	0.06	1.35	1.35	1.24	0.00	0.00	6541.71
6' Gas Flatbed	LDT2	G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26' Bobtail Truck	HHD	D	10.96	0.00	0.00	48.55	113.98	0.06	1.35	1.35	1.24	0.00	0.00	6541.71

2012 AC34 Trucks Emissions Factors - On-site Moving at 5 mph

Category	Truck Type (LT/MD/HVY)	Fuel type	On-Site Moving Emissions Factors (g/mi)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pickup Trucks	LDT2	G	0.00	0.28	0.47	4.12	0.52	0.01	0.12	0.00	0.11	0.00	0.01	1188.65
Flatbed Truck	MHD	D	0.51	0.00	0.00	6.56	9.37	0.01	0.60	0.60	0.55	0.00	0.01	1505.00

TRUCKS

Flatbed Truck	HHD	D	7.81	0.00	0.00	12.93	27.24	0.04	1.50	1.50	1.38	0.01	0.01	3845.36
6' Gas Flatbed	LDT2	G	0.00	0.28	0.47	4.12	0.52	0.01	0.12	0.00	0.11	0.00	0.01	1188.65
26' Bobtail Truck	HHD	D	7.81	0.00	0.00	12.93	27.24	0.04	1.50	1.50	1.38	0.01	0.01	3845.36

2013 AC34 Trucks Emissions Factors - Off-site Moving at Composite Speed

Category	Truck Type (LT/MD/HVY)	Fuel type	Off-Site Moving Emissions Factors (g/mi)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pickup Trucks	LDT2	G	0.00	0.05	0.04	2.14	0.31	0.00	0.03	0.00	0.02	0.00	0.00	464.24
Flatbed Truck	MHD	D	0.14	0.00	0.00	1.44	6.38	0.01	0.17	0.17	0.16	0.00	0.00	1379.58
Flatbed Truck	HHD	D	0.67	0.00	0.00	2.87	10.27	0.02	0.39	0.39	0.36	0.01	0.01	1778.49
6' Gas Flatbed	LDT2	G	0.00	0.05	0.04	2.14	0.31	0.00	0.03	0.00	0.02	0.00	0.00	464.24
26' Bobtail Truck	HHD	D	0.67	0.00	0.00	2.87	10.27	0.02	0.39	0.39	0.36	0.01	0.01	1778.49

Note: Trucks emission factors from EMFAC2007

WATER SOURCES

Type of Vessels	Engine	Fuel type	LF	HP	Emission Factors (g/bhp-hr)						
					ROG	CO	NOX	SO2	PM	DPM	PM2.5
Tug Boat	Main	D	0.5	1500	1.24	3.72	14.22	184.00	0.59	0.59	0.57
	Auxiliary	D	0.31	111	2.10	5.59	13.47	184.00	0.72	0.72	0.70
Assist tug	Main	D	0.5	1500	1.24	3.72	14.22	184.00	0.59	0.59	0.57
	Auxiliary	D	0.31	111	2.10	5.59	13.47	184.00	0.72	0.72	0.70
Bottom dump skows	Main	D	0.5	275	1.24	3.72	14.22	184.00	0.59	0.59	0.57
	Auxiliary	D	0.31	111	2.10	5.59	13.47	184.00	0.72	0.72	0.70
Tugs (ocean going)	Main	D	0.31	2500	0.72	2.79	2.79	184.00	0.48	0.48	0.47
	Auxiliary	D	0.43	110	0.98	3.25	3.25	184.00	0.67	0.67	0.65
Service boat	Main	D	0.50	1500	1.24	3.72	14.22	184.00	0.59	0.59	0.57
	Auxiliary	D	0.31	111	2.10	5.59	13.47	184.00	0.72	0.72	0.70

Note: Water sources emission factors from SF Bay Seaport Air Emissions Inventory; POSF 2005 Emissions Inventory

CONSTRUCTION EQUIPMENT

2012 AC34 Construction Equipment Emissions Summary

Location	Total Annual Emissions (tpy)									
	ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4	N2O	CO2
Pier 80	0.19	0.63	0.76	0.00	0.07	0.07	0.06	0.01	0.00	75.14
Marina Green	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.40
Fort Mason	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.64
Pier 32-36, 30-32, 26-28	0.01	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00	5.05
Pier 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 17-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 41-45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total 2012 Annual	0.21	0.66	0.84	0.00	0.07	0.07	0.06	0.02	0.00	84.23

2013 AC34 Construction Equipment Emissions Summary

Location	Total Annual Emissions (tpy)									
	ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4	N2O	CO2
Pier 27-29	0.01	0.04	0.10	0.00	0.00	0.00	0.00	0.00	0.00	12.43
Pier 80	0.06	0.21	0.25	0.00	0.02	0.02	0.02	0.00	0.00	25.85
Marina Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fort Mason	0.00	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00	3.10
Pier 32-36, 30-32, 26-28	0.35	1.16	1.77	0.00	0.11	0.11	0.10	0.03	0.00	201.03
Pier 23	0.01	0.02	0.06	0.00	0.00	0.00	0.00	0.00	0.00	6.84
Pier 48	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Pier 1	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Pier 9-15	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Pier 17-19	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Pier 41-45	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.12
Aquatic Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.46
Total 2013 Annual	0.44	1.47	2.25	0.00	0.14	0.14	0.13	0.03	0.00	255.32

TRUCKS

2012 AC34 Truck Emissions Summary

Location	Total Annual Emissions (tpy)											
	D-ROGexh	G-ROGexh	G-ROGevap	CO	NOX	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pier 80	0.01	0.00	0.00	0.08	0.16	0.00	0.01	0.01	0.01	0.00	0.00	28.46
Marina Green	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39
Fort Mason	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17
Pier 32-36, 30-32, 26-28	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.88
Pier 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 17-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 41-45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total 2012 Annual	0.01	0.00	0.00	0.09	0.17	0.00	0.01	0.01	0.01	0.00	0.00	31.90

Note: Truck emissions include both on-site and off-site emissions.

2013 AC34 Truck Emissions Summary

Location	Total Annual Emissions (tpy)											
	D-ROGexh	G-ROGexh	G-ROGevap	CO	NOX	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pier 27-29	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	5.16
Pier 80	0.00	0.00	0.00	0.03	0.06	0.00	0.00	0.00	0.00	0.00	0.00	10.92
Marina Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fort Mason	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.85
Pier 32-36, 30-32, 26-28	0.02	0.00	0.00	0.17	0.23	0.00	0.01	0.01	0.01	0.00	0.00	58.34
Pier 23	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	3.16
Pier 48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
Pier 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
Pier 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
Pier 17-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
Pier 41-45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82
Aquatic Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Total 2013 Annual	0.0	0.0	0.0	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	83.5

Note: Truck emissions include both on-site and off-site emissions.

WATER SOURCES

2012 AC34 Water Source Emissions Summary

Location	Total Annual Emissions (tpy)						
	ROG	CO	NOX	SO2	PM	DPM	PM2.5
Pier 80	0.04	0.12	0.47	0.00	0.02	0.02	0.02
Marina Green	0.04	0.12	0.44	0.00	0.02	0.02	0.02
Fort Mason	0.01	0.03	0.10	0.00	0.00	0.00	0.00
Pier 32-36, 30-32, 26-28	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 48	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 1	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 9-15	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 17-19	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pier 41-45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Aquatic Park	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total 2012 Annual	0.09	0.27	1.01	0.00	0.04	0.04	0.04

2013 AC34 Water Source Emissions Summary

Location	Total Annual Emissions (tpy)						
	ROG	CO	NOX	SO2	PM	DPM	PM2.5
Pier 27-29	0.16	0.47	1.75	0.00	0.07	0.07	0.07
Pier 80	0.01	0.02	0.06	0.00	0.00	0.00	0.00
Marina Green	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fort Mason	0.05	0.13	0.50	0.00	0.02	0.02	0.02
Pier 32-36, 30-32, 26-28	0.88	2.76	8.50	0.00	0.44	0.44	0.43
Pier 23	0.09	0.26	0.98	0.00	0.04	0.04	0.04
Pier 48	0.02	0.06	0.23	0.00	0.01	0.01	0.01
Pier 1	0.02	0.06	0.23	0.00	0.01	0.01	0.01
Pier 9-15	0.02	0.06	0.23	0.00	0.01	0.01	0.01
Pier 17-19	0.02	0.06	0.23	0.00	0.01	0.01	0.01
Pier 41-45	0.02	0.06	0.23	0.00	0.01	0.01	0.01
Aquatic Park	0.00	0.01	0.04	0.00	0.00	0.00	0.00
Total 2013 Annual	1.3	4.0	13.0	0.0	0.6	0.6	0.6

CONSTRUCTION EQUIPMENT

2012 Cruise Terminal Construction Equipment Data Summary

Location	Activity/Components	Equipment Type	Equipment Count	HP	Fuel Type	Duration (days)	Operating Hours per Day
Pier 27-29	Demolition of bldg	Truck cranes	2	350	D	20	8.0
		Hydraulic crane	1	160	D	20	8.0
		980 Loader	1	318	D	20	6.0
		Backhoe-loader	1	180	D	20	6.0
Pier 27-29	Paving/ Concrete Improvement	Pump	2	53	D	60	8.0
		Cranes	1	300	D	60	5.0
		Paver system (AC)	1	250	D	60	8.0
Pier 27-29	New building construction	Land crane	3	399	D	365	4.0
		Backhoe/ Loader	2	108	D	365	8.0
		Generator	4	49	D	365	8.0
		Compressor	10	106	D	365	8.0
		Forklift	8	83	D	365	8.0
		Welding machine	8	40	D	60	5.0

ON-ROAD TRUCKS

2012 Cruise Terminal Truck Activity Data Summary

Location	Activity/Components	Category	Truck Type (LT/MD/HVY)	Fuel type	Total one-way trips per day	Duration (days)	Total Idling hours per day	Operating hours per day (hr/day/truck)	Total distance per day (mi/day)	On-site distance per one-way trip (mi/one-way trip)	Off-site distance per one-way trip (mi/one-way trip)	On-site speed (mph)	Off-site speed (mph)
Pier 27-29	Demolition of bldg	pickups	LDT2	G	18	20	3.0	4.0	4.5	0.25	20	5	45
		Fleet of bathtub dumps	HHD	D	2	20	0.3	10.0	0.5	0.25	20	5	45
		Water truck	HHD	D	1	20	0.2	2.0	0.3	0.25	20	5	45
		Flatbed Truck	HHD	D	5	2	0.8	5.0	1.3	0.25	20	5	45
Pier 27-29	Paving/ Concrete Improvement	Concrete truck	HHD	D	4	60	0.7	5.0	1.0	0.25	20	5	45
		Pickups	LDT2	D	8	60	1.3	4.0	2.0	0.25	20	5	45
		Flatbed trucks	HHD	D	4	60	0.7	5.0	1.0	0.25	20	5	45
		Dump trucks	HHD	D	4	60	0.7	8.0	1.0	0.25	20	5	45
		Flatbed Truck	HHD	D	2	2	0.3	5.0	0.5	0.25	20	5	45
Pier 27-29	Pile driving	Pickups	LDT2	G	8	30	1.3	4.0	2.0	0.25	20	5	45
Pier 27-29	New building construction	Flatbed trucks	HHD	D	8	365	1.3	5.0	2.0	0.25	20	5	45
		Dump trucks	HHD	D	4	365	0.7	8.0	1.0	0.25	20	5	45
		Pickups	LDT2	G	48	365	8.0	4.0	12.0	0.25	20	5	45
		Flatbed Truck	HHD	D	43	2	7.2	5.0	10.8	0.25	20	5	45

WATER SOURCES**2012 Cruise Terminal Water Sources Activity Data Summary**

Location	Activity/Components	Type	Equipment Count	HP	LF	Fuel Type	Duration (days)	Operating hours per day per boat
Pier 27-29	Pile Driving	Assist tug - Main	1	1500	0.5	D	30	5.0
		Assist tug - Aux	1	111	0.31	D	30	5.0
Pier 27-29	New building construction	Assist tug - Main	1	1500	0.5	D	30	5.0
		Assist tug - Aux	1	111	0.31	D	30	5.0

2013 Cruise Terminal Activity Summary

Assume 90%/10% pre-/post race construction emissions at Pier 27-29*

CONSTRUCTION EQUIPMENT

2012 Cruise Terminal Construction Equipment Emissions Factors

Equipment Type	HP	Fuel Type	Emissions Factors (g/bhp-hr)								N2O	CO2
			ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4		
Truck cranes	350	D	0.61	1.80	4.84	0.01	0.18	0.18	0.17	0.05	0.00	568.30
Hydraulic crane	160	D	0.91	3.42	5.84	0.01	0.34	0.34	0.31	0.07	0.00	568.30
980 Loader	318	D	0.46	1.27	3.73	0.01	0.13	0.13	0.12	0.04	0.00	568.30
Backhoe-loader	180	D	0.49	1.24	4.24	0.01	0.14	0.14	0.13	0.04	0.00	568.30
Pump	53	D	1.05	3.66	5.94	0.01	0.48	0.48	0.44	0.08	0.00	568.30
Cranes	300	D	0.61	1.80	4.84	0.01	0.18	0.18	0.17	0.05	0.00	568.30
Paver system (AC)	250	D	0.75	1.86	6.05	0.01	0.24	0.24	0.22	0.06	0.00	568.30
Land crane	399	D	0.61	1.80	4.84	0.01	0.18	0.18	0.17	0.05	0.00	568.30
Backhoe/ Loader	108	D	0.98	3.91	5.39	0.01	0.47	0.47	0.44	0.08	0.00	568.30
Generator	49	D	2.05	5.03	5.49	0.01	0.47	0.47	0.43	0.16	0.00	568.30
Compressor	106	D	1.30	4.09	6.51	0.01	0.61	0.61	0.56	0.10	0.00	568.30
Forklift	83	D	1.04	3.99	5.45	0.01	0.50	0.50	0.46	0.08	0.00	568.30
Welding machine	40	D	2.70	6.19	5.75	0.01	0.56	0.56	0.52	0.21	0.00	568.30

TRUCKS

2012 AC34 Trucks Emissions Factors - Idling

Category	Truck Type (LT/MD/HV)	Fuel type	Idling Emissions Factors (g/hr)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Fleet of bathtub dumps	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Water truck	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Flatbed Truck	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Concrete truck	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Pickups	LDT2	D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Dump trucks	HHD	D	11.46	0.00	0.00	49.27	112.64	0.06	1.50	1.50	1.38	0.00	0.00	6541.72
Pickups	LDT2	G	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

2012 AC34 Trucks Emissions Factors - On-site Moving at 5 mph

Category	Truck Type (LT/MD/HV)	Fuel type	On-Site Moving Emissions Factors (g/mi)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Fleet of bathtub dumps	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Water truck	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Flatbed Truck	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Concrete truck	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Pickups	LDT2	D	0.27	0.00	0.00	2.52	2.05	0.00	0.21	0.21	0.19	0.00	0.01	350.24
Dump trucks	HHD	D	8.61	0.00	0.00	14.10	30.55	0.04	1.76	1.76	1.62	0.01	0.01	3845.36
Pickups	LDT2	G	0.00	0.37	0.51	5.15	0.58	0.01	0.12	0.00	0.11	0.00	0.01	1189.04

2012 AC34 Trucks Emissions Factors - Off-site Moving at Composite Speed

Category	Truck Type (LT/MD/HV)	Fuel type	Off-Site Moving Emissions Factors (g/mi)											
			D-ROGexh	G-ROGexh	G-ROGevp	CO	NOx	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Fleet of bathtub dumps	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Water truck	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Flatbed Truck	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Concrete truck	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Pickups	LDT2	D	0.07	0.00	0.00	0.65	1.64	0.00	0.07	0.07	0.06	0.00	0.00	350.24
Dump trucks	HHD	D	0.74	0.00	0.00	3.12	11.62	0.02	0.44	0.44	0.40	0.01	0.01	1778.49
Pickups	LDT2	G	0.00	0.08	0.05	2.65	0.36	0.00	0.02	0.00	0.02	0.00	0.00	464.39

WATER SOURCES

Type of Vessels	Engine	LF	HP	Adjusted EF (grams / hp-hr)						
				ROG	CO	NOX	SO2	PM	DPM	PM2.5
Assist tug	Main	0.5	1500	1.24	3.72	14.22	184.00	0.59	0.59	0.57
	Auxiliary	0.31	111	2.10	5.59	13.47	184.00	0.72	0.72	0.70
Tug Boat	Main	0.5	1500	1.24	3.72	14.22	184.00	0.59	0.59	0.57
	Auxiliary	0.31	111	2.10	5.59	13.47	184.00	0.72	0.72	0.70

CONSTRUCTION EQUIPMENT

2012 Cruise Terminal Construction Equipment Emissions Summary

Location	Total Annual Emissions (tpy)									
	ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4	N2O	CO2
Pier 27-29	3.67	11.47	18.18	0.02	1.48	1.48	1.36	0.28	0.00	1782.40

2013 Post-race Cruise Terminal Construction Equipment Emissions Summary

Location	Total Annual Emissions (tpy)									
	ROG	CO	NOX	SO2	PM	DPM	PM2.5	CH4	N2O	CO2
Pier 27-29	0.41	1.28	2.03	0.00	0.17	0.17	0.15	0.03	0.00	199.43

Note: Assume 90%/10% pre-/post race construction emissions at Pier 27-29.

TRUCKS

2012 Cruise Terminal Truck Emissions Summary

Location	Total Annual Emissions (tpy)											
	D-ROGexh	G-ROGexh	G-ROGevap	CO	NOX	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pier 27-29	0.11	0.03	0.03	1.54	1.65	0.00	0.07	0.05	0.06	0.00	0.00	414.55

Note: Truck emissions include both on-site and off-site emissions.

2013 Post-race Cruise Terminal Truck Emissions Summary

Location	Total Annual Emissions (tpy)											
	D-ROGexh	G-ROGexh	G-ROGevap	CO	NOX	SOx	PM10	DPM	PM25	PMtire	PMbrk	CO2
Pier 27-29	0.01	0.00	0.00	0.17	0.19	0.00	0.01	0.01	0.01	0.00	0.00	46.63

Notes:

- 1) Truck emissions include both on-site and off-site emissions.
- 2) Assume 90%/10% pre-/post race construction emissions at Pier 27-29.

WATER SOURCES

2012 Cruise Terminal Water Source Emissions Summary

Location	Total Annual Emissions (tpy)						
	ROG	CO	NOX	SO2	PM	DPM	PM2.5
Pier 27-29	0.33	0.99	3.68	0.00	0.15	0.15	0.15

2013 Cruise Terminal Water Source Emissions Summary

Location	Total Annual Emissions (tpy)						
	ROG	CO	NOX	SO2	PM	DPM	PM2.5
Pier 27-29	0.05	0.16	0.60	0.00	0.03	0.03	0.02

Note: Assume 90%/10% pre-/post race construction emissions at Pier 27-29.