Air Dispersion Modeling

This page left intentionally blank

Appendix E2
Dispersion Modeling of Criteria Pollutants

1.0 Introduction

This document describes the methods and results of air dispersion modeling that predict the ground-level concentrations of criteria pollutants resulting from construction and operation of the Port of Los Angeles (POLA) Berths 302-306 [APL] Container Terminal Project.

The air dispersion modeling was performed using the U.S. Environmental Protection Agency's (USEPA) AERMOD Modeling System, version 09292, based on the Guideline on Air Quality Models (40 Code of Federal Regulations [CFR], Part 51, Appendix W, November 2005). Criteria pollutants, including nitrogen dioxide (NO_2), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter equal or less than 10 microns in diameter (PM_{10}), particulate matter equal or less than 2.5 microns in diameter ($PM_{2.5}$) were modeled for the CEQA and NEPA Baselines and Project alternatives. The predicted ground-level concentrations were compared to the relevant South Coast Air Quality Management District (SCAQMD) air quality significance thresholds to determine the air quality impacts of the project.

2.0 Development of Emission Scenarios Used in the Air Dispersion Modeling

2.1 Construction Emission Sources

Project construction activities would involve the use of:

- Off-road construction equipment
- On-road trucks
- Tugboats
- General cargo ships

In accordance with SCAQMD guidance, only onsite construction emission sources were modeled for criteria pollutant impacts (SCAQMD, 2005b). Onsite emissions sources included fugitive dust, onsite construction equipment, onsite haul trucks, and general cargo ship hoteling (for shoreside gantry crane delivery). Offsite truck hauling, general cargo ship transit, and tugboat/barge activity are considered offsite and were not modeled for construction.

Construction modeling was performed for the first year of construction which was the peak year of construction emissions (assumed to be 2012 for this analysis). Both unmitigated and mitigated construction impacts were modeled.

2.2 Construction Emissions

Maximum 24-hour Emissions: Maximum daily (24-hour) emissions from construction on the terminal were calculated by first calculating daily emissions from individual construction activities (for example, wharf construction, marine terminal crane delivery, or backlands construction). Maximum daily emissions then were determined by summing emissions from overlapping construction activities as indicated in the proposed construction schedule (Table 2-2) of the EIS/EIR.

Maximum 1-hour and 8-hour Emissions: The construction schedule is assumed to be 8 hours per day, 5 days per week, and 50 weeks per year. Daily construction activities were assumed to be constant throughout the workday. Therefore, the maximum 1-hour emissions were estimated by dividing the maximum daily emission rates by 8 hours, except for ship hoteling emissions, which were divided by 24 hours. The same emission rates, on a per-hour basis, were used for the 8-hour averaging period.

A summary of the construction emissions used in the AERMOD modeling for the proposed Project is provided in Table 2-1. The emissions used in this AERMOD modeling differ from the construction emissions summarized in Section 3.2 of the EIS/EIR because the offsite emissions were not included in the AERMOD dispersion modeling.

Table 2-1. Peak Daily Emissions Associated with Proposed Project Construction Activities – Proposed Project Without Mitigation

Emission Source	Peak Daily Emissions (lb/day)[d]					
	VOC	CO	NO_X	SO_X	PM_{10}[a]	$PM_{2.5}$[a]
Project Year 2012						
Phase 1a - Wharf Construction	73	268	692	1	113	45
Phase 1b - Backland Construction	37	153	331	0	53	22
Phase 1h - Crane Installation[b]	101	95	794	37	97	90
Phase 1e - Building Construction	13	54	127	0	23	9
Phase 1f - Reefer Area Expansion	13	52	119	0	11	6
Phase 1g - Utility Infrastructure	5	18	49	0	2	2
All Phases - Worker Commute	1	11	1	0	16	4
Peak Daily Construction Emissions	**243**	**651**	**2,113**	**38**	**313**	**176**

The dispersion modeling analysis for project construction also included operational emissions during the period of overlap between construction and operations. Specifically, the concentrations from the peak year of construction emissions (2012) were added to the 2012 operational concentrations, and the results were compared to the construction concentration thresholds. The operational emissions used in dispersion modeling for 2012 are summarized in Table 2-2.

1

Table 2-2. 2012 Operational Emissions – Proposed Project and All Alternatives

	Sources	NOx		PM10		PM2.5		CO	SO2	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
1	Container Ship 1 - Hotelling	95.06	39.61	2.26	19.33	1.79	15.31	3.60	46.59	2.372
2	Container Ship 2 - Hotelling	95.06	39.61	2.26	19.33	1.79	15.31	3.60	46.59	2.372
3	Container Ship 3 - Hotelling	95.06	39.61	2.26	19.33	1.79	15.31	3.60	46.59	2.372
4	Harbor Transit	24.90	113.44	0.61	5.52	0.48	4.41	18.91	3.32	1.720
5	Container Ships Precautionary Zone Transit - All	21.26	72.28	0.43	3.87	0.34	3.09	11.17	4.55	1.740
6	Container Ships Precautionary Zone Transit - North	21.26	72.28	0.43	3.87	0.34	3.09	11.17	4.55	1.740
7	Tugs in Harbor Transit	10.47	39.70	0.41	3.51	0.38	3.23	10.36	0.04	0.016
8	Container Ships - Turning and Docking	13.57	24.06	0.31	2.82	0.25	2.25	3.24	3.80	0.667
9	Ocean-Going Vessels Anchorage Spatial Allocation	1.75	0.00	0.04	0.00	0.03	0.00	0.00	0.00	0.000
10	Rail - Terminal Island to Anaheim St - DAY	15.75	11.46	0.45	2.94	0.41	2.70	2.12	0.07	0.008
11	Rail - Terminal Island to Anaheim St - NIGHT	15.75	11.46	0.45	2.94	0.41	2.70	2.12	0.07	0.008
12	On-Dock Rail APL - Switch Engines - DAY	6.06	3.69	0.15	0.80	0.14	0.75	1.04	0.03	0.004
13	On-Dock Rail APL - Switch Engines - NIGHT	6.06	3.69	0.15	0.80	0.14	0.75	1.04	0.03	0.004
14	On-Dock Rail APL - Line Haul - DAY	17.47	12.89	0.50	3.30	0.46	3.04	2.38	0.08	0.009
15	On-Dock Rail APL - Line Haul - NIGHT	17.47	12.89	0.50	3.30	0.46	3.04	2.38	0.08	0.009
16	Trucks - Queuing at In-Gate1	16.42	6.21	0.01	0.09	0.01	0.09	1.08	0.05	0.003
17	On-Terminal Trucks	19.83	7.50	1.34	10.16	0.40	3.03	2.18	0.42	0.021
18	Trucks - I-110: Anaheim St to Vincent Thomas Bridge	6.03	2.28	0.66	5.00	0.23	1.74	0.86	0.19	0.009
19	Trucks - Vincent Thomas Bridge	2.71	1.03	0.22	1.67	0.06	0.48	0.28	0.07	0.004

Table 2-2. 2012 Operational Emissions – Proposed Project and All Alternatives

	Sources	NOx		PM10		PM2.5		CO	SO2	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
20	Trucks - Hwy 47 on Terminal Island	2.09	0.79	0.16	1.19	0.04	0.33	0.20	0.05	0.003
21	Trucks - Terminal from APL to Ocean Blvd.	10.93	4.14	0.82	6.23	0.23	1.75	1.05	0.26	0.013
22	Trucks - Ocean Blvd: Terminal to 47/I-710 Split	6.52	2.47	0.49	3.72	0.14	1.04	0.63	0.16	0.008
23	Trucks - I-710: Anaheim St to 47 on Terminal Island	15.68	5.93	0.78	5.87	0.23	1.71	1.68	0.24	0.012
24	Trucks - 47 on Terminal Island betwn H. Ford & Ocean Blvd	4.58	1.73	0.40	2.99	0.11	0.86	0.49	0.12	0.006
25	Trucks - Henry Ford Ave.	1.07	0.41	0.09	0.66	0.02	0.19	0.11	0.03	0.001
26	Trucks - 47 N: Anaheim to H. Ford	1.70	0.64	0.17	1.29	0.05	0.40	0.21	0.05	0.003
27	Terminal Island - CHE Source for Yard/Marine/Rail Equipment	125.15	53.10	3.76	36.10	3.46	33.22	13.32	1.49	0.071
28	Workers - I-110: Anaheim St to Vincent Thomas Bridge	0.29	0.38	0.56	4.38	0.11	0.89	4.61	0.04	0.007
29	Workers - Vincent Thomas Bridge	0.11	0.14	0.21	1.63	0.04	0.33	1.72	0.02	0.003
30	Workers - Hwy 47 on Terminal Island	0.08	0.10	0.15	1.17	0.03	0.24	1.23	0.01	0.002
31	Workers - Terminal from APL to Ocean Blvd.	0.20	0.26	0.39	3.04	0.08	0.62	3.20	0.03	0.005
32	Workers - Ocean Blvd: Terminal to 47/I-710 Split	0.08	0.10	0.15	1.18	0.03	0.24	1.24	0.01	0.002
33	Workers - I-710: Anaheim St to 47 on Terminal Island	0.12	0.15	0.23	1.78	0.05	0.36	1.87	0.02	0.003
34	Workers - 47 on Terminal Island betwn H. Ford & Ocean Blvd	0.06	0.08	0.12	0.96	0.03	0.20	1.01	0.01	0.002
35	Workers - Henry Ford Ave.	0.01	0.02	0.03	0.21	0.01	0.04	0.22	0.00	0.000

Table 2-2. 2012 Operational Emissions – Proposed Project and All Alternatives

	Sources	NOx		PM10		PM2.5		CO	SO2	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
36	Workers - 47 N: Anaheim to H. Ford	0.03	0.03	0.05	0.40	0.01	0.08	0.42	0.00	0.001

2.3 Operational Emission Sources

Both on-site and off-site emission sources were included in the modeling of operational emissions. The following operational emission sources were included in the air dispersion modeling for CO, NO_2, PM_{10}, $PM_{2.5}$, and SO_2. Detailed descriptions of the sources and their emissions are discussed in Section 2 of Appendix E3 (Health Risk Assessment Report).

- **Ships transiting** to and from the berth. Ship transit in SCAQMD waters consists of fairway transit, Precautionary Area transit, harbor transit, turning, and docking. The ship emission sources include the main propulsion engine, auxiliary engines, and boiler.
- **Ships hoteling** while at berth. Hoteling emission sources include the ship auxiliary engines and boiler; the main propulsion engine is turned off during hoteling.
- **Tugboats** used to assist the container ships between the POLA breakwater and the berth (two tugboats per ship assist). Emission sources include the main propulsion and auxiliary engines of tugboats.
- **Cargo Handling Equipment**, including yard tractors, rubber-tired gantry cranes (RTGs), top picks, side picks, forklifts, and other miscellaneous equipment.
- **Locomotives** switching and idling at the APL on-dock rail yard, and hauling trains between the APL on-dock rail yard and the Alameda Corridor, as far north as the Anaheim Street.
- **Trucks** driving on near-Port roads, driving on the APL terminal, and idling at the Berth 302-306 in-gate. Based on the results of a sensitivity analysis conducted for the China Shipping EIS/EIR (LAHD 2008), emissions from roadways farther from the terminal area, including State Route (SR)-47 from the Vincent Thomas Bridge to Seaside Avenue, I-110 north of Anaheim Street, Alameda Street north of Anaheim Street, Sepulveda Boulevard east of Alameda Street, and Anaheim Street east of Alameda Street have negligible impacts compared to the other sources at or near POLA and, therefore, were not included in the air dispersion modeling.

2.4 Operational Emissions

To evaluate the air quality impacts of project operations, peak operational emissions were calculated for the project analysis years of 2012, 2015, 2020, 2025, and 2027. The year with the highest emission for a given pollutant was modeled for all operational sources in that year. Operational emissions for the various sources and averaging times were discussed in Section 3.2.4.1 Methodology of this EIS/EIR. Summaries of the emissions included in the dispersion model runs are shown in Tables 2-3 and 2-4.

1

Table 2-3. Proposed Project Source Emissions Without Mitigation for Dispersion Modeling

	Sources	NOx		PM10		PM2.5		CO	SOx	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
1	Container Ship 1 - Hotelling	49.52	39.61	1.31	10.55	1.03	8.29	3.60	29.07	2.37
2	Container Ship 2 - Hotelling	49.52	39.61	1.31	10.55	1.03	8.29	3.60	29.07	2.37
3	Container Ship 3 - Hotelling	49.52	39.61	1.31	10.55	1.03	8.29	3.60	29.07	2.37
4	Container Ship 4 - Hotelling	49.52	39.61	1.31	10.55	1.03	8.29	3.60	29.07	2.37
5	Harbor Transit	29.26	113.44	0.71	11.04	0.57	8.82	18.91	6.65	1.72
5	Container Ships Precautionary Zone Transit - All	25.16	72.28	0.50	7.74	0.40	6.19	11.17	9.10	1.74
6	Container Ships Precautionary Zone Transit - North	25.16	72.28	0.50	7.74	0.40	6.19	11.17	9.10	1.74
8	Tugs in Harbor Transit	4.12	12.80	0.08	1.18	0.08	1.08	11.16	0.07	0.02
9	Container Ships - Turning and Docking	15.93	24.06	0.37	5.64	0.29	4.50	3.24	7.59	0.67
10	Ocean-Going Vessels Anchorage Spatial Allocation	2.09	0.00	0.05	0.00	0.04	0.00	0.00	0.00	0.00
11	Rail - Terminal Island to Anaheim St - DAY	21.50	14.86	0.57	3.52	0.52	3.24	3.07	0.11	0.00
12	Rail - Terminal Island to Anaheim St - NIGHT	21.50	14.86	0.57	3.52	0.52	3.24	3.07	0.11	0.00
13	On-Dock Rail APL - Switch Engines - DAY	6.06	3.69	0.15	0.80	0.14	0.75	1.04	0.03	0.00
14	On-Dock Rail APL - Switch Engines - NIGHT	6.06	3.69	0.15	0.80	0.14	0.75	1.04	0.03	0.00
15	On-Dock Rail APL - Line Haul - DAY	23.95	16.68	0.63	3.96	0.58	3.64	3.44	0.12	0.00
16	On-Dock Rail APL - Line Haul - NIGHT	23.95	16.68	0.63	3.96	0.58	3.64	3.44	0.12	0.00
17	Trucks - Queuing at In-Gate1	23.28	8.81	0.02	0.13	0.02	0.12	1.53	0.08	0.00
18	On-Terminal Trucks	34.34	12.99	2.13	16.11	0.70	5.32	4.21	0.63	0.00
19	Trucks - I-110: Anaheim St to Vincent Thomas Bridge	8.70	3.29	0.89	6.73	0.35	2.61	1.38	0.24	0.00
20	Trucks - Vincent Thomas Bridge	3.91	1.48	0.29	2.20	0.09	0.69	0.44	0.09	0.00

Table 2-3. Proposed Project Source Emissions Without Mitigation for Dispersion Modeling

Sources		NOx		PM10		PM2.5		CO	SOx	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
21	Trucks - Hwy 47 on Terminal Island	3.01	1.14	0.21	1.56	0.06	0.48	0.32	0.06	0.00
22	Trucks - Terminal from APL to Ocean Blvd.	17.82	6.74	1.22	9.24	0.38	2.86	1.91	0.37	0.00
23	Trucks - Ocean Blvd: Terminal to 47/I-710 Split	11.05	4.18	0.76	5.73	0.23	1.77	1.18	0.23	0.00
24	Trucks - I-710: Anaheim St to 47 on Terminal Island	23.13	8.75	1.05	7.91	0.34	2.55	2.76	0.31	0.00
25	Trucks - 47 on Terminal Island betwn H. Ford & Ocean Blvd	8.50	3.21	0.67	5.06	0.21	1.61	1.01	0.20	0.00
26	Trucks - Henry Ford Ave.	1.99	0.75	0.15	1.12	0.05	0.35	0.23	0.04	0.00
27	Trucks - 47 N: Anaheim to H. Ford	3.15	1.19	0.29	2.20	0.10	0.76	0.44	0.08	0.00
28	Terminal Island - CHE Source for Yard/Rail/Marine Equipment	195.18	72.13	6.40	51.64	5.89	47.51	17.83	1.96	0.00
29	Workers - I-110: Anaheim St to Vincent Thomas Bridge	0.35	0.42	0.89	6.47	0.18	1.33	5.40	0.06	0.00
30	Workers - Vincent Thomas Bridge	0.13	0.16	0.33	2.41	0.07	0.49	2.01	0.02	0.00
31	Workers - Hwy 47 on Terminal Island	0.09	0.11	0.24	1.72	0.05	0.35	1.44	0.02	0.00
32	Workers - Terminal from APL to Ocean Blvd.	0.24	0.29	0.61	4.49	0.13	0.92	3.75	0.04	0.00
33	Workers - Ocean Blvd: Terminal to 47/I-710 Split	0.09	0.11	0.24	1.74	0.05	0.36	1.45	0.02	0.00
34	Workers - I-710: Anaheim St to 47 on Terminal Island	0.14	0.17	0.36	2.63	0.07	0.54	2.20	0.03	0.00
35	Workers - 47 on Terminal Island betwn H. Ford & Ocean Blvd	0.08	0.09	0.19	1.41	0.04	0.29	1.18	0.01	0.00
36	Workers - Henry Ford Ave.	0.02	0.02	0.04	0.31	0.01	0.06	0.26	0.00	0.00
37	Workers - 47 N: Anaheim to H. Ford	0.03	0.04	0.08	0.59	0.02	0.12	0.49	0.01	0.00

Notes:
Peak year for emissions are: 2015 for 1-Hour and Annual NOx, Annual PM10, and 24-Hour and Annual PM2.5; and 2027 for 1-Hour CO, 1-Hour and 24-Hour SO2, and 24-Hour PM10.

1

Table 2-4. Proposed Project Source Emissions With Mitigation for Dispersion Modeling

	Sources	NOx		PM10		PM2.5		CO	SOx	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
1	Container Ship 1 - Hotelling	49.52	39.61	1.31	3.33	1.03	8.18	3.60	14.04	2.372
2	Container Ship 2 - Hotelling	49.52	39.61	1.31	3.33	1.03	8.18	3.60	14.04	2.372
3	Container Ship 3 - Hotelling	49.52	39.61	1.31	3.33	1.03	8.18	3.60	14.04	2.372
4	Container Ship 4 - Hotelling	49.52	39.61	1.31	3.33	1.03	8.18	3.60	14.04	2.372
5	Harbor Transit	29.26	113.44	0.71	17.61	0.57	8.82	28.46	12.65	3.164
5	Container Ships Precautionary Zone Transit - All	25.16	72.28	0.50	10.32	0.40	6.19	15.27	11.34	2.126
6	Container Ships Precautionary Zone Transit - North	25.16	72.28	0.50	10.32	0.40	6.19	15.27	11.34	2.126
8	Tugs in Harbor Transit	4.12	12.80	0.08	1.59	0.08	1.08	12.65	0.07	0.016
9	Container Ships - Turning and Docking	15.93	24.06	0.37	6.84	0.29	4.50	4.19	8.27	0.742
10	Ocean-Going Vessels Anchorage Spatial Allocation	2.09	0.00	0.05	0.00	0.04	0.00	0.00	0.00	0.000
11	Rail - Terminal Island to Anaheim St - DAY	21.50	14.86	0.57	1.60	0.52	3.24	3.39	0.12	0.013
12	Rail - Terminal Island to Anaheim St - NIGHT	21.50	14.86	0.57	1.60	0.52	3.24	3.39	0.12	0.013
13	On-Dock Rail APL - Switch Engines - DAY	6.06	3.69	0.15	0.80	0.14	0.75	1.04	0.03	0.004
14	On-Dock Rail APL - Switch Engines - NIGHT	6.06	3.69	0.15	0.80	0.14	0.75	1.04	0.03	0.004
15	On-Dock Rail APL - Line Haul - DAY	23.95	16.68	0.63	1.75	0.58	3.64	3.71	0.13	0.014
16	On-Dock Rail APL - Line Haul - NIGHT	23.95	16.68	0.63	1.75	0.58	3.64	3.71	0.13	0.014
17	Trucks - Queuing at In-Gate1	23.28	8.81	0.02	0.17	0.02	0.12	1.91	0.10	0.005
18	On-Terminal Trucks	34.34	12.99	2.13	21.07	0.70	5.32	4.06	0.10	0.005
19	Trucks - I-110: Anaheim St to Vincent Thomas Bridge	8.70	3.29	0.89	8.82	0.35	2.61	1.33	0.29	0.015

Table 2-4. Proposed Project Source Emissions With Mitigation for Dispersion Modeling

	Sources	NOx		PM10		PM2.5		CO	SOx	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
20	Trucks - Vincent Thomas Bridge	3.91	1.48	0.29	2.83	0.09	0.69	0.43	0.11	0.005
21	Trucks - Hwy 47 on Terminal Island	3.01	1.14	0.21	2.01	0.06	0.48	0.31	0.08	0.004
22	Trucks - Terminal from APL to Ocean Blvd.	17.82	6.74	1.22	11.89	0.38	2.86	1.84	0.46	0.023
23	Trucks - Ocean Blvd: Terminal to 47/I-710 Split	11.05	4.18	0.76	7.37	0.23	1.77	1.14	0.29	0.014
24	Trucks - I-710: Anaheim St to 47 on Terminal Island	23.13	8.75	1.05	10.21	0.34	2.55	2.66	0.39	0.019
25	Trucks - 47 on Terminal Island betwn H. Ford & Ocean Blvd	8.50	3.21	0.67	6.52	0.21	1.61	0.97	0.25	0.012
26	Trucks - Henry Ford Ave.	1.99	0.75	0.15	1.44	0.05	0.35	0.22	0.06	0.003
27	Trucks - 47 N: Anaheim to H. Ford	3.15	1.19	0.29	2.86	0.10	0.76	0.42	0.10	0.005
28	Terminal Island - CHE Source for Yard/Rail/Marine Equipment	49.20	23.16	2.14	3.84	1.97	19.90	17.57	2.40	0.114
29	Workers - I-110: Anaheim St to Vincent Thomas Bridge	0.35	0.42	0.89	7.94	0.18	1.33	2.98	0.08	0.013
30	Workers - Vincent Thomas Bridge	0.13	0.16	0.33	2.96	0.07	0.49	1.11	0.03	0.005
31	Workers - Hwy 47 on Terminal Island	0.09	0.11	0.24	2.11	0.05	0.35	0.79	0.02	0.003
32	Workers - Terminal from APL to Ocean Blvd.	0.24	0.29	0.61	5.51	0.13	0.92	2.07	0.05	0.009
33	Workers - Ocean Blvd: Terminal to 47/I-710 Split	0.09	0.11	0.24	2.14	0.05	0.36	0.80	0.02	0.003
34	Workers - I-710: Anaheim St to 47 on Terminal Island	0.14	0.17	0.36	3.23	0.07	0.54	1.21	0.03	0.005
35	Workers - 47 on Terminal Island betwn H. Ford & Ocean Blvd	0.08	0.09	0.19	1.74	0.04	0.29	0.65	0.02	0.003
36	Workers - Henry Ford Ave.	0.02	0.02	0.04	0.39	0.01	0.06	0.14	0.00	0.001

Table 2-4. Proposed Project Source Emissions With Mitigation for Dispersion Modeling

	Sources	NOx		PM10		PM2.5		CO	SOx	
		Annual (tons/yr)	Peak Hour (lbs/hr)	Annual (tons/yr)	Peak Day (lbs/day)	Annual (tons/yr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)	Peak Day (lbs/day)	Peak Hour (lbs/hr)
37	Workers - 47 N: Anaheim to H. Ford	0.03	0.04	0.08	0.73	0.02	0.12	0.27	0.01	0.001

Notes:
Peak year for emissions are: 2015 for 1-Hour and Annual NOx, Annual PM10, and 24-Hour and Annual PM2.5; and 2027 for 1-Hour CO, 1-Hour and 24-Hour SO2, and 24-Hour PM10.

3.0 Dispersion Modeling

3.1 Dispersion Model Selection and Inputs

The air dispersion modeling was performed using the USEPA AERMOD dispersion model, version 09292, based on the Guideline on Air Quality Models (40 CFR, Part 51, Appendix W; November 9, 2005). The AERMOD model is a steady-state, multiple source, Gaussian dispersion model designed for use with emission sources situated in terrain where ground elevations can exceed the stack heights of the emission sources. The AERMOD model requires hourly meteorological data consisting of wind direction wind speed, temperature, stability class, and mixing height. The AERMOD model allows input of multiple sources and source groupings, eliminating the need for multiple model runs. The selection of the AERMOD model is well suited based on (1) the general acceptance by the modeling community and regulatory agencies of its ability to provide reasonable results for large industrial complexes with multiple emission sources, (2) a consideration of the availability of annual sets of hourly meteorological data for use by AERMOD, and (3) the ability of the model to handle the various physical characteristics of project emission sources, including, "point," "area," and "volume" source types. AERMOD is a USEPA-approved dispersion model; the SCAQMD approves of its use for mobile source analyses.

In addition to AERMOD modeling of all project sources, modeling of traffic-related CO concentrations was also conducted for several major intersections that would be impacted by the proposed Project or alternatives. This CO "hot spots" modeling was conducted using CAL3QHC. The resulting files in included in Attachment E2.1.

3.1.1 Construction Emission Sources

Emissions from construction trucks and equipment were modeled as an area source on the terminal and assigned a release height of 5 meters (16 feet), which is the approximate average height of the exhaust port plus a nominal amount of plume rise and is consistent with past POLA EIRs. Construction fugitive dust emission sources were modeled an area source on the terminal with their emissions were distributed uniformly throughout the area. Hoteling cargo ships deliverying shoreside gantry cranes were modeled as stationary point sources. The source release parameters used in the AERMOD modeling for construction emissions are shown in Table 3-1.

Table 3-1. AERMOD Source Release Parameters – Construction Emissions

Source Description	AERMOD Source Type	Release Height (ft)	Source Width (m)	Exit Velocity (ft/min)	Exit Temp. (°F)	Stack Diam. (ft)
Construction Equipment	Area-Poly	16	Various[a]	--	--	--
Construction Fugitive Dust	Area-Poly	3.3	Various[a]	--	--	--
Ship Hoteling[b]	Point	122	--	1800	570	1.3

Notes:

a. One polygon area source that approximately covered the APL terminal with a release height of 5 m (16 ft) was used in the model for construction equipment and trucks, and a second polygon area source of the same size with a release height of 1 m (3.3 ft) was used in the model for construction equipment and trucks, and a second was used for construction fugitive dust.

b. Cargo ship hoteling included auxiliary engine and boilder emissions (no AMP).

3.1.2 Operational Emission Sources

The AERMOD modeling analysis evaluated project-related operational emission sources, including container ships, assist tugboats, terminal and rail yard equipment, locomotives, and trucks. Emissions from the movement of vessels in the shipping lanes, trains on rail lines, and trucks on roadways are line source emissions that were simulated and modeled as a series of separated volume sources. Single volume sources were used to model tugboat and ship emissions during turning and docking at the berths. Mobile source operations confined within specific geographic locations, such as cargo handling equipment in the Berths 302-306 Terminal and rail yard, were modeled as a polygon area source covering the area. Finally, stationary emissions from hoteling ships were modeled as stationary point (stack) sources with upward plume velocity and buoyancy.

The operational characteristics of each source type in terms of area of operation and vertical stack height or source height determined the release parameters of each volume or point source. The specific methodology for defining the sources is summarized below.

1. **Ship Transit Lanes (Precautionary Area, and Harbor Transit).** Emissions from marine vessels that transit between the offshore shipping lanes and the berth were simulated as a series of separated volume sources beginning approximately at the far edge of the Precautionary Area and extending to the Berths 302-306 wharf. Total transit emissions were calculated and divided equally among the volume sources for each of the Precautionary Area and Harbor Transit segments. Tug assist emissions were also included in the Harbor Transit volume sources.

2. **Vessel Berth Maneuvering Area (Turning and Docking).** Ship Turning and Docking represent activities with concentrated emissions that occur in designated locations near the berth. As a result, dedicated volume sources were created to simulate these activities.

3. **Vessel Hoteling Locations.** Because the vessels are stationary, hoteling emission sources were modeled as stack-type point sources located adjacent to Berths 302-206.

4. **Vessel Temporary Achorage.** Occasionally, incoming ships were required to stop temporarily inside the harbor for inspection as an example. These temporary stops typically lasted approximately three hours or less. The area where the ships were anchored was modeled as an polygon area source.

5. **Terminal and Rail Yard Areas.** The areas of the Berth 302-306 terminal, truck in-gate, and rail yard were overlain with polygon areas sources to achieve complete coverage of the surface areas where the sources operate. The emissions were assumed to be spread uniformly over the entire area sources.

6. **Roadways and railways.** Truck and gasoline vehicle movements on roadways and train movements on rail lines were modeled as a series of separated volume sources, as recommended for the simulation of line sources in the AERMOD User's Guide (USEPA, 2004). Emissions from roadways were assigned a release height of 15 feet, which is the approximate average height of the exhaust port plus a nominal amount of plume rise from trucks, which is consistent with past POLA EIRs. Based on the methodology in the Roseville Rail Yard Study, the volume source heights for locomotives in transit were set to different heights for daytime conditions compared to nighttime conditions (CARB, 2004).

Emission sources were positioned by using the Universal Transverse Mercator (UTM) coordinate system (NAD-27) referenced to topographic data obtained from the U.S. Geological Survey (USGS). The source release parameters used in the AERMOD modeling for operational emissions were shown in Table 3-2. The source locations are shown on Figure 3-1.

Table 3-2. Source Release Parameters – Operational Emissions

AERMOD Source Type	Source Description	No. of Sources Represented	Release Height (m)	Source Width (m)	Initial Vertical Thickness[a] (ft)
Elevated Polygon Area	On-Terminal Trucks	1	5	Varies[c]	3.9
Elevated Polygon Area	Trucks – Queuing in at Gate	1	4.572	Varies[c]	15
Elevated Polygon Area	Cargo Handling Equipment	1	5	Varies[c]	3.9
Elevated Area	Ocean-Going Vessels Anchorage Spatial Allocation	1	50	Varies[d]	38.1
Line	Rail – Terminal Island to Anaheim St. (Day)	125	5.58	15	8.53
Line	Rail – Terminal Island to Anaheim St. (Night)	125	14.54	15	22.18
Line	On-Dock Rail – Switch Engines (Day)	26	6.64	50	10.14
Line	On-Dock Rail – Switch Engines (Night)	26	13.56	50	20.7
Line	On-Dock Rail – Line Haul (Day)	15	6.64	50	10.14
Line	On-Dock Rail – Line Haul (Night)	15	13.56	50	20.7
Line	Ships – Harbor Transit	14	59.13	100	60.47
Line	Ships – Precautionary Zone (PZ) Transit (All Routes)	53	49.07	300	29.76
Line	Ships – Southern Route PZ to Pt. Fermin	352	49.07	300	29.76
Line	Offsite Trucks	312	4.57	Varies[e]	7
Line	Assist Tugs	14	15.24	100	23.26
Line	Workers – Vincent Thomas	47	56.39	18	3.48

Table 3-2. Source Release Parameters – Operational Emissions

AERMOD Source Type	Source Description	No. of Sources Represented	Release Height (m)	Source Width (m)	Initial Vertical Thickness[a] (ft)
	Bridge				
Line	Workers – Other Route Segments[f,g]	36	4.57	24	7
Volume	Container Ships – Turning and Docking	1	78.638	300	120
Point	Container Ships – Hoteling	1	44.501		N/A

Notes:

[a] The initial vertical dimension of the plume (σ_z) was estimated by dividing the initial vertical thickness by 4.3 for elevated releases and 2.15 for ground-based releases.

[b]Based on a series of visual observations of containership exhaust plumes at the POLA, the plume height was conservatively assumed to be 25% above stack height for fairway and precautionary area transit, 50% above stack height for harbor transit, and 100% above stack height for turning and docking. The lower apparent wind speeds at slower ship speeds result in a higher plume rise (LAHD 2008 [China Shipping FEIS/EIR]).

[c]Area source width varies from approximately 875 – 2,000 meters.

[d]Area source width varies from approximately 2,000 – 4,000 meters.

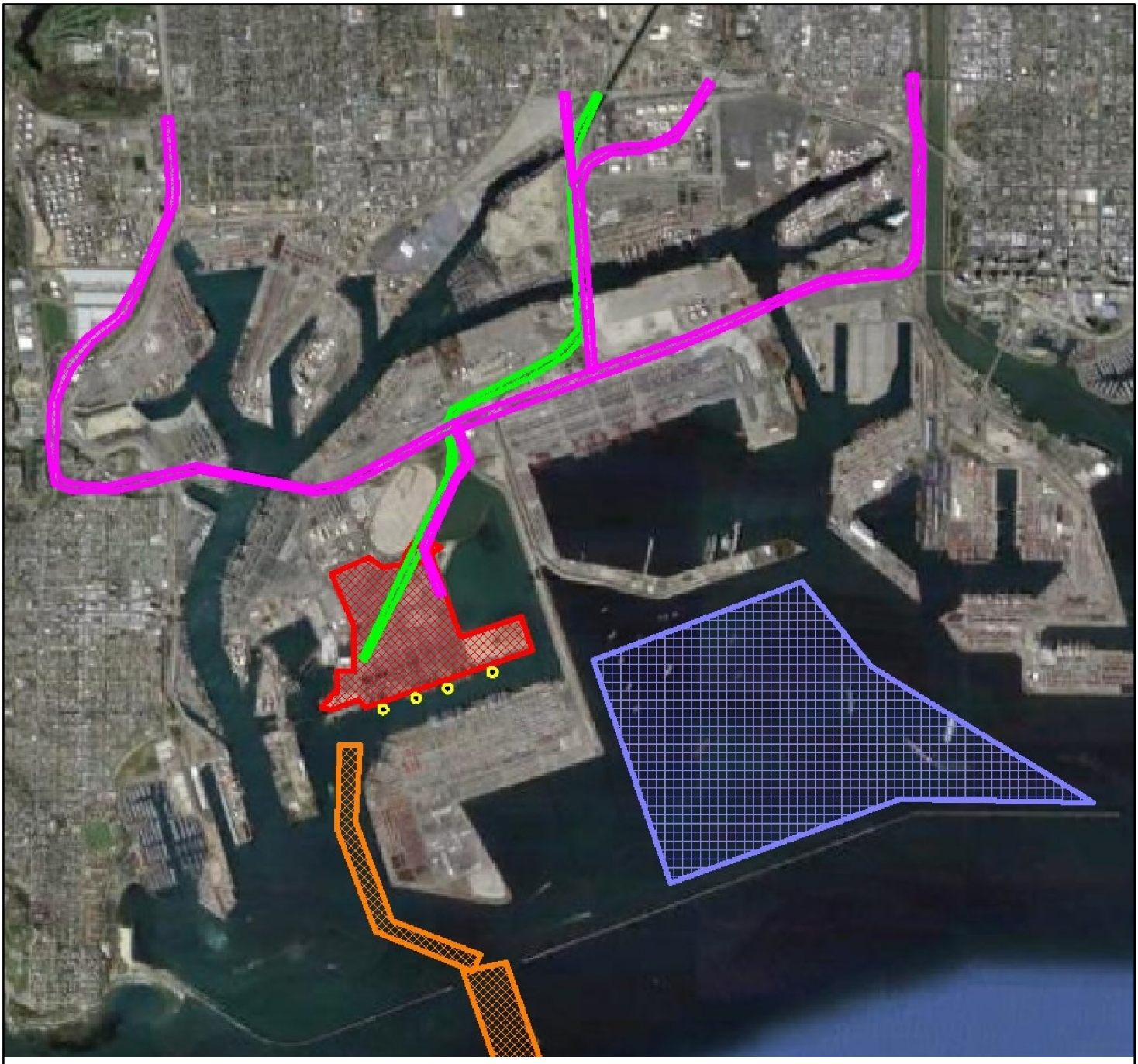
[e]Width of representative volume sources varies from 18 – 60 meters.

[f]Width of representative volume srouces varies from 24 to 60 meters.

[g]Other route segments include Highway 47 on Terminal Island between Henry Ford Ave. and Ocean Blvd., Highway 47 North from Anaheim St. to Henry Ford Ave., Highway 47 on Terminal Island, Henry Ford Ave., Interstate 110 from Anaheim St. to Vincent Thomas Bridge, Interstate 710 from Anaheim St. to Highway 47 on Terminal Island, Ocean Blvd. from Terminal to Highway 47/Interstate 110 Split, and Terminal from APL to Ocean Blvd.

1

2



Legend

Bright Pink:	Roadways – Container Trucks and Worker Vehicles
Lime Green:	Railroads – Line Haul and Switcher Locomotives
Red:	APL Terminal – CHE and on-site Trucks
Orange:	Ships and Tugs – Transiting, Turning & Docking
Yellow:	Ships – Hoteling
Blue:	Ships – Temporary Anchorage

N

CDM

Port of Los Angeles
Berths 302 - 306 [APL] Container Terminal Project
Source Location

Figure 3-1

3.1.3 Meteorological Data

The dominant terrain features/water bodies that may influence wind patterns in this part of the Los Angeles Basin include the Pacific Ocean to the west, the hills of the Palos Verdes Peninsula to the west/southwest and the San Pedro Bay and shipping channels to the south of the study area. Although the area in the immediate vicinity of the Ports of Los Angeles (POLA or the Port) and Long Beach (POLB) is generally flat, these terrain features/water bodies may result in significant variations in wind patterns over relatively short distances (POLA/POLB, 2010).

POLA and POLB currently are operating monitoring programs that include the collection of meteorological data from several locations within port boundaries (Port, 2004). The data sets contain 8,760 hourly observations of wind speed, wind direction, temperature, atmospheric stability, and mixing height recorded at each of the monitoring stations in the network. The meteorological data stations to the west of the Palos Verdes Hills and within approximately 5 kilometers of the San Pedro Bay generally exhibit predominant winds from the northwest and from the south or southeast. The consistency of the predominant winds among these stations indicates that the Palo Verdes Hills are channeling the winds from the northwest and that the San Pedro Bay and shipping channels influence the winds from the south and southeast (POLA/POLB, 2010).

For this health risk evaluation, the meteorological data collected at the Terminal Island Treatment Plant (TITP) was used for dispersion modeling. TITP is located just north of the APL container terminal on Pier 300, less than 1 km from the center of the APL terminal. The data used was collected between September 2006 and August 2007, and was processed and provided by Environ (2009).

The meteorological data were processed using the USEPA's approved AERMET (version 06341) meteorological data preprocessor for the AERMOD dispersion model. AERMET uses three steps to preprocess and combine the surface and upper-air soundings to output the data in a format which is compatible with the AERMOD model. The first step extracts the data and performs a brief quality assurance check of the data. The second step merges the meteorological data sets. The third step outputs the data in AERMOD-compatible format while also incorporating surface characteristics surrounding the collection or application site.

The output from the AERMET model consists of two separate files: the surface conditions file and a vertical profile dataset. AERMOD utilizes these two files in the dispersion modeling algorithm to predict pollutant concentrations resulting from a source's emissions.

3.1.4 Model Options

Technical options selected for the AERMOD model used regulatory defaults. Use of these options follows the USEPA modeling guidance (USEPA, 2009; and 40 CFR, Appendix W; November 2005).

3.1.5 Temporal Distribution Assumptions

Construction and operational emissions were assumed to occur during the times specified in Table 3-3. Emissions were assumed to be uniformly distributed during these time periods, with the exception of worker commute emissions which were distributed according to the estimated allocation of workers commuting during the specified times.

Temporal distribution assumptions are identical for the proposed Project and NEPA Baseline scenarios.

Table 3-3. Temporal Distribution of Emissions for CEQA Baseline, NEPA Baseline, and Proposed Project Scenarios

Source Description	Proposed Project and NEPA Baseline	CEQA BAseline
All Construction-Related On- and Off-Road Vehicle and Equipment Activity	5 Days per Week	N/A
	8:00 AM – 4:00 PM	
Cargo Ship Hoteling (Construction and Operational)	7 Days per Week	7 Days per Week (Operational Only)
	24 Hours per Day	24 Hours per Day
All Ship Transit (Construction and Operational)	7 Days per Week	7 Days per Week
	8:00 AM – 5:00 AM	8:00 AM – 12:00 PM
Cargo Handling Equipment	7 Days per Week	7 Days per Week
	8:00 AM – 5:00 AM	8:00 AM – 12:00 PM
Rail Sources (Daytime)	7 Days per Week	7 Days per Week
	8:00 AM – 5:00 PM	8:00 AM – 5:00 PM
Rail Sources (Nighttime)	7 Days per Week	7 Days per Week
	5:00 PM – 2:00 AM	5:00 PM – 12:00 PM
All Truck Transit and Idling (Operational)	Mon-Thu: 20 Hours per Day	Mon-Thu: 20 Hours per Day
	8:00 AM – 4:00 AM	8:00 AM – 4:00 AM
	Fri-Sat: 10 Hours per Day	Fri-Sat: 10 Hours per Day
	8:00 AM – 6:00 PM	8:00 AM – 6:00 PM
	Sun: 0 Hours per Day	Sun: 0 Hours per Day
Worker Commuting	7 Days per Week	7 Days per Week
	2:00 – 4:00 AM, 7:00 – 9:00 AM, 5:00 – 6:00 PM	2:00 – 4:00 AM, 7:00 – 9:00 AM, 5:00 – 6:00 PM

Notes: Operating schedules were provided by APL.

3.1.6 Receptor Locations Used in AERMOD

Receptor and source base elevations were determined from USGS Digital Elevation Model (DEM) data in 7.5-minute format; using AERMAP, version 06341. All coordinates were referenced to UTM North American Datum 1927 (NAD27) Zone 11.

To identify the extent and location of maximum impacts, two coarse Cartesian receptor grids were placed surrounding the project area, with receptors spaced 500 meters apart in each grid out to a distance of 5 km. The two grids were offset from one another by 250

meters in the north and east directions, creating a "honeycomb" grid pattern. Receptors were also placed around the property line at 100 meter intervals. On-site receptors, property line receptors bordering water, and overwater grid receptors were excluded from the analysis. In addition, schools, hospitals, convalescent homes, and day care centers identified within the project vicinity were added to the set of receptors analyzed. Figure 3-2 presents the coarse grid and sensitive receptor locations.

To refine the locations of maximum impacts, fine receptor grids were placed based on contours generated by maximum incremental impacts, with receptors spaced 50 meters apart out to a distance approximately 500 meters past the maximum impact location.

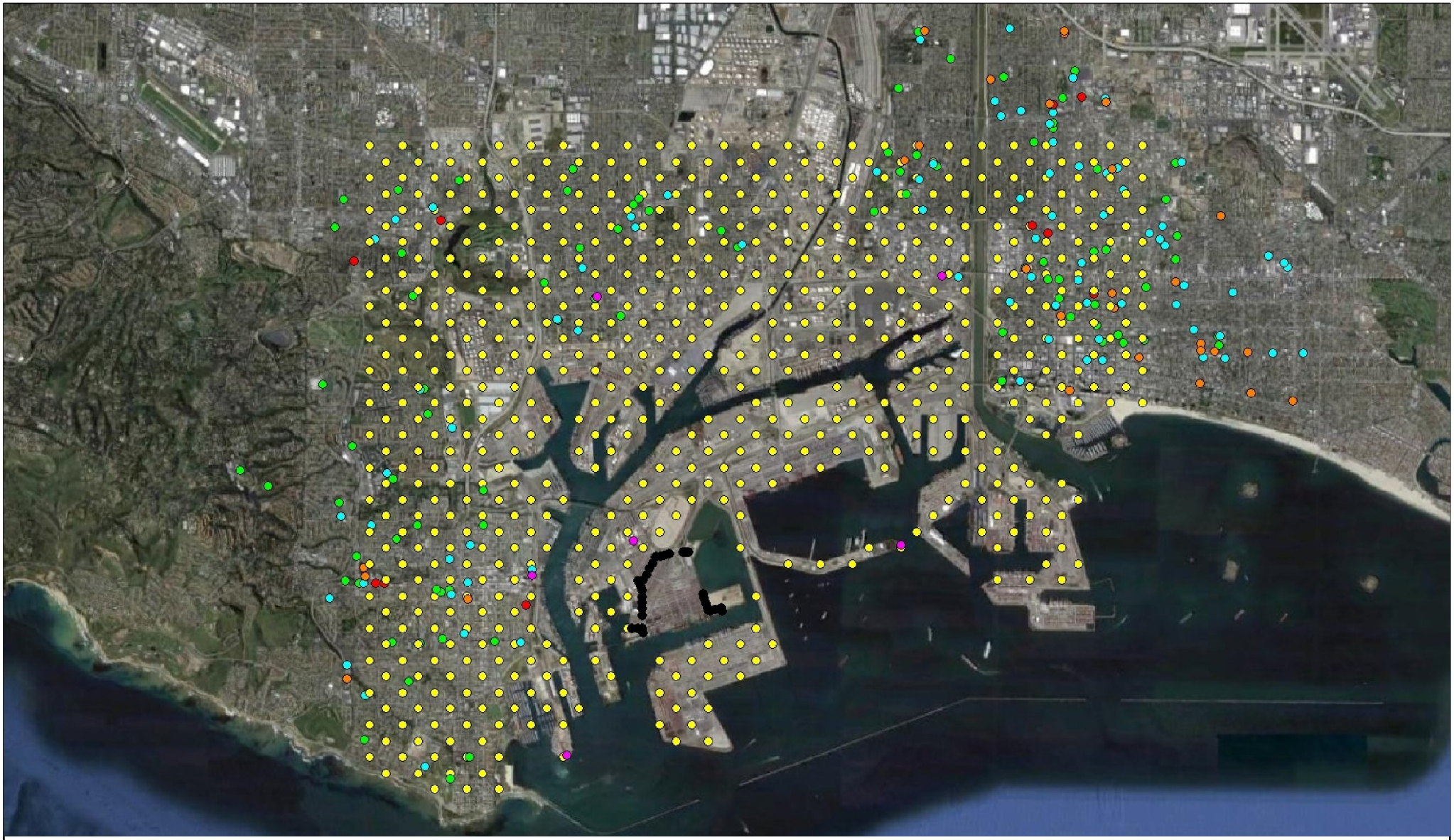
3.2 Concentration Significance Thresholds

The method for determination of significance with regard to proposed Project or alternative criteria pollutant concentrations depends on whether the pollutant is gaseous or particulate. As of this writing, the SCAQMD Air Quality Significance Thresholds table was dated March 2011.

The SCAQMD has established significance thresholds for gaseous pollutants that are typically the most stringent ambient air quality standards, which requires that the modeled concentrations be added to the existing background concentrations before comparing the impacts to the thresholds.

Concentration thresholds for particulate matter (PM_{10} and $PM_{2.5}$) are incremental thresholds for the proposed Project or alternative being evaluated, thus the modeled concentrations can be compared to the thresholds without adding in background concentrations. In addition, for expansions and modifications to existing facilities, only the impacts associated with the expansion or modification needs to be compared to the particulate matter thresholds. Thus, the CEQA Baseline or NEPA Baseline concentrations of PM_{10} and $PM_{2.5}$ should be subtracted from the proposed Project or alternative concentrations before comparison to the thresholds.

The SCAQMD significance thresholds are presented in Table 3-4, along with two additional thresholds to address Federal standards: (1) the recently adopted 1-Hour National ambient air quality standard (NAAQS) for NO_2 has been included; and (2) the annual significant impact level (SIL) for $PM_{2.5}$ was added to provide an incremental threshold for annual $PM_{2.5}$ concentrations.



Legend

- Coarse Grid Points
- Hospitals
- Nursing Homes
- Schools
- Day Care
- POLA/POLB Air Monitoring Stations
- On-Site (Existing or Alternative Fenceline)

N

CDM

Port of Los Angeles
Berths 302 - 306 [APL]
Container Terminal Project
Receptor Location
Figure 3-2

Table 3-4. SCAQMD Thresholds for Ambient Air Quality Concentrations

Air Pollutant[c]	Ambient Concentration Thresholds[a,b,c]
Nitrogen Dioxide (NO_2)	
1-hour average (federal)[d]	0.100 ppm (188 µg/m^3) (98th percentile)
1-hour average (state)	0.18 ppm (339 µg/m^3)
Annual average (state)	0.030 ppm (57 µg/m^3)
Annual average (federal)	0.0534 ppm (100 µg/m^3)
Carbon Monoxide (CO)	
1-hour average	20 ppm (23,000 µg/m^3)
8-hour average	9.0 ppm (10,000 µg/m^3)
Sulfur Dioxide (SO_2)	
1-hour average (state)	0.25 ppm (655 µg/m^3)
1-hour average (federal)[e]	0.075 ppm (196 µg/m^3) (99th percentile)
24-hour average (state)	0.04 ppm (105 µg/m^3)
Inhalable Particulates (PM_{10})	
24-hour average	10.4 µg/m^3 (for construction impacts)
24-hour average	2.5 µg/m^3 (for operational impacts)
Annual average	1.0 µg/m^3
Fine Particulates ($PM_{2.5}$)	
24-hour average	10.4 µg/m^3 (for construction impacts)
24-hour average	2.5 µg/m^3 (for operational impacts)
Annual average[f]	0.3 µg/m^3

Notes:

a) The CO thresholds, annual average NO_2 thresholds, and State SO_2 thresholds are absolute thresholds; the maximum predicted impact from proposed Project operations is added to the background concentration for the proposed Project vicinity and compared to the threshold.

b) The PM_{10} and $PM_{2.5}$ thresholds are incremental thresholds. For CEQA significance, the maximum increase in concentration above the CEQA baseline is compared to the threshold. For NEPA significance, the maximum increase in concentration above the NEPA baseline is compared to the threshold.

c) The SCAQMD has also established concentration thresholds for sulfates and lead; but operational emissions of these pollutants would be negligible, thus concentration standards would not be exceeded.

d) To evaluate Project impacts to ambient 1-hour NO_2 levels, the analysis both the current SCAQMD 1-hour State NO_2 threshold and the more stringent revised 1-hour Federal ambient air quality standard of 188 µg/m^3. To attain this standard, the 3-year average of the 98th percentile of the daily maximum 1-hour average at a receptor must not exceed 0.100 ppm.

e) To attain the SO_2 Federal 1-hour standard, the 3-year average of the 99th percentile of the daily maximum 1-hour averages at a receptor must not exceed 0.075 ppm.

f) SCAQMD does not list a Significant Impact Level for annual $PM_{2.5}$, therefore the modeled annual average $PM_{2.5}$ was compared to the PSD SIL of 0.3 µg/m3 for the determination of NEPA significance only.

Source: SCAQMD, 2011; USEPA, 2010a, 2010b, and 2010c.

1

2

3.3 Predicted Air Quality Impacts

3.3.1 Proposed Project

Table 3-5 presents the proposed Project gaseous pollutant impacts without mitigation and Table 3-6 presents the proposed Project particulate matter impacts without mitigation. For those pollutants that exceeded the threshold for a given averaging period, the mitigated impacts are presented in Table 3-7 for gaseous pollutants and Table 3-8 for particulate matter. The locations of the maximum unmitigated impacts are shown on Figures 3-3 and 3-4 for gaseous pollutants and particulate matter, respectively.

Table 3-5. Maximum Off-site NO_2, SO_2, and CO Concentrations Associated with Operation of the Proposed Project Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project (µg/m^3)	Background Concentration[b] (µg/m^3)	Total Ground Level Concentration[a] (µg/m^3)	SCAQMD Threshold (µg/m^3)
NO_2[c]	Federal 1-hour[d]	190	147	**337**	188
	State 1-hour	241	235	**476**	339
	State Annual	45	40	**85**	57
	Federal Annual	45	40	85	100
SO_2	Federal 1-hour[d]	6	53	59	196
	State 1-hour	10	288	298	655
	24-hour	0.6	31	32	105
CO	1-hour	379	4,600	4,979	23,000
	8-hour	162	2,878	3,040	10,000

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using the ozone limiting method (OLM) with ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 µg/m^3) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design values, 98th percentile for 1-hour NO_2 and 99th percentile for 1-hour SO_2, are added to the design background values for NO_2 and SO_2. (USEPA, 2011)

Table 3-6. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of the Proposed Project Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] (µg/m³)	Maximum Modeled Concentration of CEQA Baseline[b] (µg/m³)	Maximum Modeled Concentration of NEPA Baseline[b] (µg/m³)	Ground Level Concentration CEQA Increment (µg/m³)[a,c]	Ground Level Concentration NEPA Increment (µg/m³)[a,c]	SCAQMD Threshold (µg/m³)
PM_{10}	24-hour	6.2	7.1	4.9	0.6	1.3	2.5
	Annual	1.9	1.9	1.5	0.7	0.7	1.0
$PM_{2.5}$	24-hour	5.0	6.2	4.4	0.1	1.1	2.5
	Annual	1.5	1.5	1.1	NA	**0.6**	0.3[d]

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the maximum baseline concentrations from the maximum Project concentration.

c) The CEQA Increment represents the Unmitigated Project minus CEQA baseline. The NEPA Increment represents the Unmitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m^3 (USEPA 2010c) for the determination of NEPA significance only.

Table 3-7. Maximum Off-site NO_2 Concentration Associated with Operation of the Proposed Project With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project (µg/m^3)	Background Concentration[b] (µg/m^3)	Total Ground Level Concentration[a] (µg/m^3)	SCAQMD Threshold (µg/m^3)
NO_2[c]	Federal 1-hour[d]	179	147	**325**	188
	State 1-hour	225	235	**460**	339
	State Annual	40	40	**80**	57

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using the ozone limiting method (OLM) with ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 µg/m^3) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design value (98th) for 1-hour NO_2 is added to the design value background value for NO_2. (USEPA, 2011)

1
2
3
4

Table 3-8. Maximum Off-site $PM_{2.5}$ Concentration Associated with Operation of the Proposed Project With Mitigation

Pollutant	**Averaging Time**	**Maximum Modeled Concentration of Proposed Project[b] (µg/m^3)**	**Maximum Modeled Concentration of NEPA Baseline[b] (µg/m^3)**	**Ground Level Concentration NEPA Increment[a,c]**	**Threshold (µg/m^3)[d]**
$PM_{2.5}$	Annual	0.7	1.1	0.1	0.3

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the maximum baseline concentrations from the maximum Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The NEPA Increment represents the Unmitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m^3 (USEPA 2010c) for the determination of NEPA significance only.

N

CDM

0 0.1 0.2 0.4 Miles

Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Proposed Project Gaseous Criteria Pollutant
Maximum Impact Locations Without Mitigation

Figure 3-3

N

CDM

0 0.1 0.2 0.4 Miles

Port of Los Angeles

Berths 302 - 306 [APL] Container Terminal Project

Proposed Project Particulate Matter
Maximum Impact Locations Without Mitigation

Figure 3-4

3.3.2 Alternative1 / Alternative 2 / NEPA Baseline

Table 3-9 presents gaseous pollutant impacts without mitigation, and Table 3-10 presents the proposed Project particulate matter impacts without mitigation, for Alternative 1/ Alternative 2 (NEPA Baseline).

Table 3-9. Maximum Off-site NO_2, SO_2, and CO Concentrations Associated with Operation of Alternative 2 (NEPA Baseline) without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project ($\mu g/m^3$)	Background Concentration[b] ($\mu g/m^3$)	Total Ground Level Concentration[a] ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2[c]	Federal 1-hour[d]	163	147	**398**	188
	State 1-hour	203	235	**438**	339
	State Annual	38	40	**78**	57
	Federal Annual	38	40	78	100
SO_2	Federal 1-hour[d]	5	53	58	196
	State 1-hour	9	288	297	655
	24-hour	0.6	31	32	105
CO	1-hour	261	4,600	4,861	23,000
	8-hour	110	2,878	2,988	10,000

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design values, 98th percentile for 1-hour NO_2 and 99th percentile for 1-hour SO_2, are added to the design background values for NO_2 and SO_2. (USEPA, 2011)

Table 3-10. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of the Alternative 2 (NEPA Baseline) without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] (µg/m³)	Maximum Modeled Concentration of CEQA Baseline[b] (µg/m³)	Maximum Modeled Concentration of NEPA Baseline[b] (µg/m³)	Ground Level Concentration CEQA Increment (µg/m³)[a,c]	Ground Level Concentration NEPA Increment (µg/m³)[a,c]	SCAQMD Threshold (µg/m³)
PM_{10}	24-hour	0.1	0.3	0	(0.2)	0	2.5
	Annual	2.2	2.0	0	0.1	0	1.0
$PM_{2.5}$	24-hour	0.1	0.2	0	(0.1)	0	2.5
	Annual	0.9	0.9	0	0.0	0	0.3[d]

Notes:

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from the Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The CEQA Increment represents the Project minus CEQA baseline. The NEPA Increment is zero because Alternative 2 is equivalent to the NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m³ (USEPA 2010c) for the determination of NEPA significance only.

3.3.3 Alternative 3

Table 3-11 presents Alternative 3 gaseous pollutant impacts without mitigation and Table 3-12 presents the proposed Project particulate matter impacts without mitigation. For those pollutants that exceeded the threshold for a given averaging period, the mitigated impacts are presented in Table 3-13 for gaseous pollutants.

Table 3-11. Maximum Off-site NO_2, SO_2, and CO Concentrations Associated with Operation of Alternative 3 Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alt. 3 ($\mu g/m^3$)	Background Concentration[b] ($\mu g/m^3$)	Total Ground Level Concentration [a] ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [c]	Federal 1-hour[d]	160	147	**307**	188
	State 1-hour	198	235	**433**	339
	State Annual	38	40	**78**	57
	Federal Annual	38	40	78	100
SO_2	Federal 1-hour[d]	5	53	58	196
	State 1-hour	9	288	297	655
	24-hour	1	31	32	105
CO	1-hour	273	4,600	4,873	23,000
	8-hour	115	2,878	2,993	10,000

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design values, 98th percentile for 1-hour NO_2 and 99th percentile for 1-hour SO_2, are added to the design background values for NO_2 and SO_2. (USEPA, 2011)

1

Table 3-12. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of Alternative 3 Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] ($\mu g/m^3$)	Maximum Modeled Concentration of CEQA Baseline[b] ($\mu g/m^3$)	Maximum Modeled Concentration of NEPA Baseline[b] ($\mu g/m^3$)	Ground Level Concentration CEQA Increment ($\mu g/m^3$)[a,c]	Ground Level Concentration NEPA Increment ($\mu g/m^3$)[a,c]	SCAQMD Threshold ($\mu g/m^3$)
PM_{10}	24-hour	0.1	0.3	0	(0.2)	0	2.5
	Annual	0.5	0.5	0.9	0.1	0.2	1.0
$PM_{2.5}$	24-hour	0.1	0.2	0	(0.1)	0	2.5
	Federal Annual	0.9	0.9	0	NA	0	0.3[d]

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the maximum baseline concentrations from the maximum Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The CEQA Increment represents the Mitigated Project minus CEQA baseline. The NEPA Increment represents the Mitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 $\mu g/m^3$ (USEPA 2010c) for the determination of NEPA significance only.

Table 3-13. Maximum Off-site NO_2 Concentration Associated with Operation of Alternative 3 With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alt. 3 ($\mu g/m^3$)	Background Concentration[b] ($\mu g/m^3$)	Total Ground Level Concentration[a] ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [c]	Federal 1-hour[d]	160	147	**307**	188
	State 1-hour	198	235	**433**	339
	State Annual	38	40	**78**	57

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98^{th} percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design value (98^{th}) for 1-hour NO_2 is added to the background design value for NO_2. (USEPA, 2011)

3.3.4 Alternative 4

Table 3-14 presents Alternative 4 gaseous pollutant impacts without mitigation and Table 3-15 presents the proposed Project particulate matter impacts without mitigation. For those pollutants that exceeded the threshold for a given averaging period, the mitigated impacts are presented in Table 3-16 for gaseous pollutants and Table 3-17 for particulate matter.

Table 3-14. Maximum Off-site NO_2, SO_2, and CO Concentrations Associated with Operation of Alternative 4 Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alt. 4 ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Total Ground Level Concentration ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [c]	Federal 1-hour[d]	178	147	**325**	188
	State 1-hour	224	235	**459**	339
	State Annual	50	40	**90**	57
	Federal Annual	50	40	90	100
SO_2	Federal 1-hour[d]	6	53	59	196
	State 1-hour	10	288	298	655
	24-hour	0.6	31	32	105
CO	1-hour	(2)	4,600	4,598	23,000

	8-hour	(1)	2,878	2,877	10,000

Notes:

a) Exceedances of the thresholds are indicated in **bold**.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design values, 98th percentile for 1-hour NO_2 and 99th percentile for 1-hour SO_2, are added to the design background values for NO_2 and SO_2. (USEPA, 2011)

1

Table 3-15. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of the Alternative 4

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] ($\mu g/m^3$)	Maximum Modeled Concentration of CEQA Baseline[b] ($\mu g/m^3$)	Maximum Modeled Concentration of NEPA Baseline[b] ($\mu g/m^3$)	Ground Level Concentration CEQA Increment ($\mu g/m^3$)[a,c]	Ground Level Concentration NEPA Increment ($\mu g/m^3$)[a,c]	SCAQMD Threshold ($\mu g/m^3$)
PM_{10}	24-hour	7.0	6.7	5.7	0.1	1.5	2.5
	Annual	1.8	1.4	1.7	0.5	0.4	1.0
$PM_{2.5}$	24-hour	4.6	4.3	1.1	0.3	1.1	2.5
	Federal Annual	1.4	1.1	1.3	NA	**0.3**	0.3[d]

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from the Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The CEQA Increment represents the Project minus CEQA baseline. The NEPA Increment represents the Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 $\mu g/m^3$ (USEPA 2010c) for the determination of NEPA significance only.

2

Table 3-16. Maximum Off-site NO_2 Concentration Associated with Operation of Alternative 4 With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Alt. 4 (µg/m^3)	Background Concentration[b] (µg/m^3)	Total Ground Level Concentration[a] (µg/m^3)	SCAQMD Threshold (µg/m^3)
NO_2[c]	Federal 1-hour[d]	165	147	**312**	188
	State 1-hour	206	235	**441**	339
	State Annual	45	40	**85**	57
	Federal Annual	45	40	85	100

Notes:

a) Exceedances of the thresholds are indicated in **bold**.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 µg/m^3) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design value (98th percentile) for 1-hour NO2 is added to the background design value for NO_2. (USEPA, 2011)

1

Table 3-17. Maximum Off-site PM2.5 Concentration Associated with Operation of Alternative 4 With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration[b] (µg/m^3)	Maximum Modeled Concentration of CEQA Baseline[b] (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline[b] (µg/m^3)	Ground-Level Concentration NEPA Increment[a,c] (µg/m^3)	Threshold (µg/m^3)[d]
$PM_{2.5}$	Annual	0.3	0.2	0.2	0.1	0.3

Notes:

a) Exceedances of the threshold are indicated in bold. The threshold for PM_{10} is an incremental threshold; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table might not occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from Alternative 4 concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project illustrates how the increments are calculated.

c) The CEQA Increment represents project minus CEQA baseline. The NEPA Increment represents project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m^3 (USEPA 2010c) for the determination of NEPA significance only.

2

3

4

3.3.5 Alternative 5

Table 3-18 presents Alternative 5 gaseous pollutant impacts without mitigation and Table 3-19 presents the proposed Project particulate matter impacts without mitigation. For those pollutants that exceeded the threshold for a given averaging period, the mitigated impacts are presented in Table 3-20 for gaseous pollutants and Table 3-21 for particulate matter.

Table 3-18. Maximum Off-site NO_2, SO_2, and CO Concentrations Associated with Operation of Alternative 5 Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project ($\mu g/m^3$)	Background Concentration[b] ($\mu g/m^3$)	Total Ground Level Concentration[a] ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2[c]	Federal 1-hour[d]	190	147	**337**	188
	State 1-hour	241	235	**476**	339
	State Annual	45	40	**85**	57
	Federal Annual	45	40	85	100
SO_2	Federal 1-hour[d]	6	53	59	196
	State 1-hour	10	288	298	655
	24-hour	0.6	31	32	105
CO	1-hour	379	4,600	4,979	23,000
	8-hour	162	2,878	3,040	10,000

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using the ozone limiting method (OLM) with ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98^{th} percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design values, 98^{th} percentile for 1-hour NO_2 and 99^{th} percentile for 1-hour SO_2, are added to the design background values for NO_2 and SO_2. (USEPA, 2011)

1

Table 3-19. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of Alternative 5 Without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] (µg/m³)	Maximum Modeled Concentration of CEQA Baseline[b] (µg/m³)	Maximum Modeled Concentration of NEPA Baseline[b] (µg/m³)	Ground Level Concentration CEQA Increment (µg/m³)[a,c]	Ground Level Concentration NEPA Increment (µg/m³)[a,c]	SCAQMD Threshold (µg/m³)
PM_{10}	24-hour	6.2	7.1	4.9	0.6	1.3	2.5
	Annual	1.9	1.9	1.5	0.7	0.7	1.0
$PM_{2.5}$	24-hour	5.0	6.2	4.4	0.1	1.1	2.5
	Annual	1.5	1.5	1.1	NA	**0.6**	0.3[d]

Notes:

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from the Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The CEQA Increment represents the Unmitigated Project minus CEQA baseline. The NEPA Increment represents the Unmitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m³ (USEPA 2010c) for the determination of NEPA significance only.

2

3

1

Table 3-20. Maximum Off-site NO_2 Concentration Associated with Operation of Alternative 5 With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project ($\mu g/m^3$)	Background Concentration[b] ($\mu g/m^3$)	Total Ground Level Concentration [a] ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2 [c,d]	Federal 1-hour[d]	179	147	**325**	188
	State 1-hour	225	235	**460**	339
	State Annual	40	40	**80**	57

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using the ozone limiting method (OLM) with ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98^{th} percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design value (98^{th}) for 1-hour NO_2 is added to the design value background value for NO_2. (USEPA, 2011)

2

3

Table 3-21. Maximum Off-site $PM_{2.5}$ Concentration Associated with Operation of Alternative 5 With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] ($\mu g/m^3$)	Maximum Modeled Concentration of NEPA Baseline[b] ($\mu g/m^3$)	Ground Level Concentration NEPA Increment[a,c]	Threshold ($\mu g/m^3$)[d]
$PM_{2.5}$	Annual	0.7	1.1	0.1	0.3

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from the Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The NEPA Increment represents the Unmitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 $\mu g/m^3$ (USEPA 2010c) for the determination of NEPA significance only.

3.3.6 Alternative 6

Table 3-22 presents Alternative 5 gaseous pollutant impacts without mitigation and Table 3-23 presents the proposed Project particulate matter impacts without mitigation. For those pollutants that exceeded the threshold for a given averaging period, the mitigated impacts are presented in Table 3-24 for gaseous pollutants and Table 3-25 for particulate matter.

Table 3-22. Maximum Off-site NO_2, SO_2, and CO Concentrations Associated with Operation of Alternative 6 without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project ($\mu g/m^3$)	Background Concentration[b] ($\mu g/m^3$)	Total Ground Level Concentration[a] ($\mu g/m^3$)	SCAQMD Threshold ($\mu g/m^3$)
NO_2[c]	Federal 1-hour[d]	190	147	**337**	188
	State 1-hour	241	235	**476**	339
	State Annual	45	40	**85**	57
	Federal Annual	45	40	85	100
SO_2	Federal 1-hour[d]	6	53	59	196
	State 1-hour	10	288	298	655
	24-hour	0.6	31	32	105
CO	1-hour	379	4,600	4,979	23,000
	8-hour	162	2,878	3,040	10,000

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using the ozone limiting method (OLM) with ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98^{th} percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 $\mu g/m^3$) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design values, 98^{th} percentile for 1-hour NO_2 and 99^{th} percentile for 1-hour SO_2, are added to the design background values for NO_2 and SO_2. (USEPA, 2011)

1

Table 3-23. Maximum Off-site PM_{10} and $PM_{2.5}$ Concentrations Associated with Operation of Alternative 6 without Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] (µg/m³)	Maximum Modeled Concentration of CEQA Baseline[b] (µg/m³)	Maximum Modeled Concentration of NEPA Baseline[b] (µg/m³)	Ground Level Concentration CEQA Increment (µg/m³)[a,c]	Ground Level Concentration NEPA Increment (µg/m³)[a,c]	SCAQMD Threshold (µg/m³)
PM_{10}	24-hour	6.2	7.1	4.9	0.6	1.3	2.5
	Annual	1.9	1.9	1.5	0.7	0.7	1.0
$PM_{2.5}$	24-hour	5.0	6.2	4.4	0.1	1.1	2.5
	Annual	1.5	1.5	1.1	NA	**0.6**	0.3[d]

Notes:

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from the Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The CEQA Increment represents the Unmitigated Project minus CEQA baseline. The NEPA Increment represents the Unmitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m³ (USEPA 2010c) for the determination of NEPA significance only.

2

Table 3-24. Maximum Off-site NO_2 Concentration Associated with Operation of Alternative 6 With Mitigation

Pollutant	**Averaging Time**	**Maximum Modeled Concentration of Proposed Project (µg/m³)**	**Background Concentration[b] (µg/m³)**	**Total Ground Level Concentration[a] (µg/m³)**	**SCAQMD Threshold (µg/m³)**
NO_2[c]	Federal 1-hour[d]	179	147	**325**	188
	State 1-hour	225	235	**460**	339
	State Annual	40	40	**80**	57

Notes:

a) Exceedances of the thresholds are indicated in bold.

b) The background concentrations were obtained from the North Long Beach Monitoring Station. The maximum concentrations during the years of 2007, 2008, and 2009 were used.

c) NO_2 concentrations were calculated using the ozone limiting method (OLM) with ozone data from the North Long Beach monitoring station. The 1-hour NO_2 concentration is calculated using the 98th percentile of the daily maximum 1-hour average to compare with the new federal 1-hour NO_2 standard of 0.100 ppm (188 µg/m³) (effective January 22, 2010).

d) According to USEPA guidance, the modeled design value (98th) for 1-hour NO_2 is added to the design value background value for NO_2. (USEPA, 2011)

3

Table 3-25. Maximum Off-site $PM_{2.5}$ Concentration Associated with Operation of Alternative 6 With Mitigation

Pollutant	Averaging Time	Maximum Modeled Concentration of Proposed Project[b] (µg/m^3)	Maximum Modeled Concentration of NEPA Baseline[b] (µg/m^3)	Ground Level Concentration NEPA Increment[a,c]	Threshold (µg/m^3)[d]
$PM_{2.5}$	Annual	0.7	1.1	0.1	0.3

Notes:

a) Exceedances of the threshold are indicated in bold. The thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds; therefore, the incremental concentration without background is compared to the threshold.

b) The maximum concentrations and increments presented in this table do not necessarily occur at the same receptor location. This means that the increments cannot necessarily be determined by simply subtracting the baseline concentrations from the Project concentration. The example provided in the discussion of Impact AQ-7 for the proposed Project describes how the increments are calculated.

c) The NEPA Increment represents the Unmitigated Project minus NEPA baseline.

d) SCAQMD does not list a threshold for annual $PM_{2.5}$, therefore the modeled maximum annual average $PM_{2.5}$ was compared to the USEPA Prevention of Significant Deterioration (PSD) Significant Impact Level (SIL) of 0.3 µg/m^3 (USEPA 2010c) for the determination of NEPA significance only.

4.0 References

Environ Corporation (Environ). 2009. Personal communication, S. Lee (Environ) to J. Pehrson (CDM), November 17. Re: POLA APL Met Data.

Los Angeles Harbor Department (LAHD). 2008. *Berth 97-109 [China Shipping] Container Terminal Project Final Environmental Impact Statement/Environmental Impact Report*. Appendix E2. December. Web site: http://www.portoflosangeles.org/EIR/ChinaShipping/DEIR/AppendixE2_Disperson_Modeling.pdf.

Port of Los Angeles and Port of Long Beach (POLA/POLB). 2010. *Final 2010 San Pedro Bay Ports Clean Air Action Plan Update.* Attachment I to Appendix B - Sphere of Influence Bay-Wide Sphere of Influence Analysis for Surface Meteorological Stations Near the Ports. Web site: http://www.cleanairactionplan.org/civica/filebank/blobdload.asp?BlobID=2439.

Port of Los Angeles (POLA). 2004. *Final Air Quality Monitoring Work Plan for the Port of Los Angeles.*

South Coast Air Quality Management District (SCAQMD). 2011. "SCAQMD Air Quality Significance Thresholds," March. Web site: http://www.aqmd.gov/ceqa/handbook/signthres.pdf.

U.S. Environmental Protection Agency (USEPA). 2009. *AERMOD Implementation Guide.* Last Revised: March 19, 2009. Web site: http://www.epa.gov/ttn/scram/7thconf/aermod/aermod_implmtn_guide_19March2009.pdf.

U.S. E nvironmental Protection Agency (USEPA). 2010a. *Primary National Ambient Air Quality Standards for Nitrogen Dioxide. Final Rule.* 75 FR 6474, February 9.

U.S. E nvironmental Protection Agency (USEPA). 2010b. *Primary National Ambient Air Quality Standards for Sulfur Dioxide. Final Rule.* 75 FR 35520, June 22.

U.S. E nvironmental Protection Agency (USEPA). 2010c. *Prevention of Significant Deterioration (PSD) for Particulate Matter Less Than 2.5 Micrometers (PM2.5) - Increments, Significant Impact Levels (SILs) and Significant Monitoring Concentration (SMC). Final Rule.* 75 FR 64864, October 20.

U.S. Environmental Protection Agency (USEPA). 2011. "Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO2 National Ambient Air Quality Standard." Memorandum from Tyler Fox to Regional Air Division Directors. March 1.

Attachment E2.1

CO Hot Spots CAL3QHC Model Output

CAL3QHC Model Output
Ferry St and Terminal Way
Midday Peak Hour
Proposed Project - 2027

```
    CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                   JUNE 1989 VERSION
                   PAGE   1

              JOB: C:\POLA1\Calroads\APL_PP_12.clv
              RUN: CALINE4 RUN      (WORST CASE ANGLE)
        POLLUTANT: Carbon Monoxide


   I.  SITE VARIABLES

          U=    .5 M/S             Z0= 200. CM            ALT=     0. (M)
        BRG= WORST CASE             VD=   .0 CM/S
       CLAS=     7 (G)              VS=   .0 CM/S
       MIXH= 1000. M               AMB= **** PPM
      SIGTH=    5. DEGREES        TEMP= 10.0 DEGREE (C)


  II.  LINK VARIABLES

       LINK      *  LINK COORDINATES (M)   *              EF     H     W
    DESCRIPTION  *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (M)   (M)
 ----------------*---------------------------*------------------------------
 A. Link_27      * ***** ***** ***** ***** *  IN   5500  30.0     .0  45.0
 B. Link_28      * ***** ***** ***** ***** *  IN  34234  30.0    5.0  45.0


        *   MIXW
        *  L    R   STPL DCLT  ACCT   SPD                    EFI   IDT1  IDT2
  LINK * (M)  (M)  (M)  (SEC) (SEC) (MPH) NCYC NDLA  VPHO (G/MIN) (SEC) (SEC)
  -----*-------------------------------------------------------------------------
-
    A.  *   0.   0.  910   6.    8.   30.   100  100   500  30.00    60.   75.
    B.  *   0.   0.  910   6.    8.   30.   100  100   100  30.00     5.    5.
```

```
               JOB: C:\POLA1\Calroads\APL_PP_12.clv
               RUN: CALINE4 RUN      (WORST CASE ANGLE)
         POLLUTANT: Carbon Monoxide


 III.  RECEPTOR LOCATIONS

              *    COORDINATES (M)
   RECEPTOR   *    X      Y      Z
 -------------*---------------------
  1. LR_1     * 385360 ******   1.8
  2. LR_2     * 385364 ******   1.8
  3. LR_3     * 385371 ******   1.8
  4. LR_4     * 385367 ******   1.8
  5. LR_5     * 385417 ******   1.8
  6. LR_6     * 385370 ******   1.8
  7. LR_7     * 385343 ******   1.8
  8. LR_8     * 385390 ******   1.8
  9. LR_9     * 385360 ******   1.8
 10. LR_10    * 385364 ******   1.8
 11. LR_11    * 385371 ******   1.8
 12. LR_12    * 385367 ******   1.8


  IV.  MODEL RESULTS (WORST CASE WIND ANGLE )

              *       * PRED  * CONC/LINK
              *  BRG  * CONC  *   (PPM)
   RECEPTOR   * (DEG) * (PPM) *   A    B
--------------*-------*-------*----------
  1. LR_1     *  158. * ***** *  2.7  4.7
  2. LR_2     *  133. * ***** *  1.5  8.7
  3. LR_3     *  126. * ***** *  1.0 11.4
  4. LR_4     *  191. * ***** *  2.4  5.3
  5. LR_5     *  262. * ***** *  1.1 14.7
  6. LR_6     *   97. * ***** *   .0 10.5
  7. LR_7     *   56. * ***** *   .7 13.5
  8. LR_8     *  274. * ***** *   .1 11.7
  9. LR_9     *  158. * ***** *  2.7  4.7
 10. LR_10    *  133. * ***** *  1.5  8.7
 11. LR_11    *  126. * ***** *  1.0 11.4
 12. LR_12    *  191. * ***** *  2.4  5.3


EXIT
```

CAL3QHC Model Output
Seaside Ave and Navy Way
p.m. Peak Hour
Proposed Project - 2027

```
            CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
                     JUNE 1989 VERSION
                     PAGE   1

                JOB: C:\POLA1\Calroads\APL_PP_12.clv
                RUN: CALINE4 RUN      (WORST CASE ANGLE)
          POLLUTANT: Carbon Monoxide


  I.  SITE VARIABLES

         U=    .5 M/S            Z0= 200. CM            ALT=     0. (M)
       BRG= WORST CASE            VD=   .0 CM/S
      CLAS=     7 (G)             VS=   .0 CM/S
      MIXH= 1000. M              AMB= **** PPM
     SIGTH=    5. DEGREES       TEMP= 10.0 DEGREE (C)


  II.  LINK VARIABLES

       LINK      *  LINK COORDINATES (M)   *              EF     H     W
    DESCRIPTION  *   X1    Y1    X2    Y2  * TYPE  VPH  (G/MI)  (M)   (M)
  ---------------*-------------------------*------------------------------
  A. Link_27     * ***** ***** ***** ***** *  IN   5500  30.0     .0  45.0
  B. Link_28     * ***** ***** ***** ***** *  IN  34234  30.0    5.0  45.0


       *   MIXW
       *  L    R   STPL DCLT  ACCT   SPD                    EFI   IDT1  IDT2
  LINK * (M)  (M)  (M)  (SEC) (SEC) (MPH) NCYC NDLA  VPHO (G/MIN) (SEC) (SEC)
  -----*-------------------------------------------------------------------------
-
   A.  *   0.   0.  910   6.    8.   30.   100  100   500  30.00    60.   75.
   B.  *   0.   0.  910   6.    8.   30.   100  100   100  30.00     5.    5.

  III.  RECEPTOR LOCATIONS

            *    COORDINATES (M)
   RECEPTOR  *    X      Y      Z
  -----------*--------------------
  1. LR_1    * 385360 ******   1.8
  2. LR_2    * 385364 ******   1.8
  3. LR_3    * 385371 ******   1.8
  4. LR_4    * 385367 ******   1.8
  5. LR_5    * 385417 ******   1.8
  6. LR_6    * 385370 ******   1.8
  7. LR_7    * 385343 ******   1.8
  8. LR_8    * 385390 ******   1.8
  9. LR_9    * 385360 ******   1.8
 10. LR_10   * 385364 ******   1.8
 11. LR_11   * 385371 ******   1.8
 12. LR_12   * 385367 ******   1.8

  IV.  MODEL RESULTS (WORST CASE WIND ANGLE )

            *       * PRED  * CONC/LINK
            *  BRG  * CONC  *   (PPM)
```

RECEPTOR	(DEG)	(PPM)	A	B
1. LR_1	158.	*****	2.7	4.7
2. LR_2	133.	*****	1.5	8.7
3. LR_3	126.	*****	1.0	11.4
4. LR_4	191.	*****	2.4	5.3
5. LR_5	262.	*****	1.1	14.7
6. LR_6	97.	*****	.0	10.5
7. LR_7	56.	*****	.7	13.5
8. LR_8	274.	*****	.1	11.7
9. LR_9	158.	*****	2.7	4.7
10. LR_10	133.	*****	1.5	8.7
11. LR_11	126.	*****	1.0	11.4
12. LR_12	191.	*****	2.4	5.3

EXIT