Appendix B2
Air Dispersion Modeling

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1.0 Introduction

This appendix describes the methods and results of air dispersion modeling that predict the ground-level concentrations of criteria pollutants from past and future operation of the China Shipping Container Terminal at Berths 97-109. The analysis modeled the following concentrations:

- 1-hour and annual nitrogen dioxide (NO_2);
- 1-hour and 24-hour sulfur dioxide (SO_2);
- 1-hour and 8-hour carbon monoxide (CO);
- 24-hour and annual particulate matter less than ten microns (PM_{10}); and
- 24-hour particulate matter less than 2.5 microns ($PM_{2.5}$).

The following two scenarios were analyzed:

- **Revised Project:** this scenario is the proposed Project for which this Draft Revised Supplemental EIR (RSEIR) has been prepared. As described in Section 2 of the Draft RSEIR, the 2008 EIS/EIR for the China Shipping Container Terminal included a number of mitigation measures, some of which have yet to be fully implemented for various reasons. The Revised Project consists of continued future operation of the terminal under the new or modified mitigation measures described in Section 2.5.1 of the Draft RSEIR. Revised Project impacts were evaluated for future years 2026, 2036, and 2045. The analysis for the Revised Project also evaluated actual emissions associated with terminal operation in past years 2012, 2014, and 2018-2023.
- **FEIR Mitigated Scenario:** this scenario represents operation of the terminal as it would have been and would be with timely implementation of all 2008 EIS/EIR mitigation measures. The FEIR Mitigated Scenario was evaluated for the same past, present, and future analysis years as the Revised Project. Analysis of the FEIR Mitigated Scenario is provided for informational purposes to compare to the Revised Project.

For more details about the baseline and scenarios, see Section 2.0 in Appendix B1.

Air quality impacts of the two Project scenarios described above were analyzed relative to a 2008 Actual Baseline, which represents the actual emissions associated with terminal operation in 2008. As discussed in Section 3.1.4.2 of the RSEIR, the terminal was in compliance with applicable 2008 EIS/EIR mitigation measures during the 2008 Actual Baseline year.

Due to improvements in procedures and assumptions used to calculate emissions and in atmospheric dispersion modeling procedures used to estimate resulting pollutant concentrations, it is not possible to directly compare air quality impacts presented in the 2008 Final EIS/EIR with impacts calculated for this Draft RSEIR, nor is it possible to reproduce the outdated methods, models, and procedures used to analyze air quality impacts in the 2008 EIS/EIR. Therefore, this appendix presents an evaluation of air quality impacts using current, state-of-the-art emission estimation and air quality modeling procedures. The emission estimation procedures are described more fully in Appendix B1.

The air dispersion modeling was performed using the U.S. Environmental Protection Agency's (USEPA's) AERMOD Modeling system, version 24142 (USEPA, 2024). The modeling methodology was based on the USEPA's *Guideline on Air Quality Models*

(USEPA 2024b) and the South Coast Air Quality Management District's (SCAQMD's) Modeling Guidance for AERMOD (SCAQMD 2024). Ambient concentrations of NO_2, CO, SO_2, PM_{10}, and $PM_{2.5}$ were modeled for the two scenarios for each past and future analysis year. The maximum predicted impacts for the Project scenarios were compared to the relevant SCAQMD air quality significance thresholds.

2.0 Estimation of Emissions Used in the Air Dispersion Modeling

2.1 Emission Source Identification

The following operational emission sources were modeled in AERMOD:

- Container ships transiting between the SCAQMD overwater boundary and the terminal (about 40 nautical miles), anchoring while waiting for an available berth, and hoteling while at berth. Ship emission sources include propulsion engines, auxiliary engines, and boilers.
- Tugboats used to assist ships while arriving and departing the Port. Tugboat emission sources include propulsion and auxiliary engines.
- Locomotives performing switching activities at the on-dock rail yard; and line-haul locomotives moving and idling at the on-dock rail yard, and hauling trains to and from the yard. Locomotive emission sources include engine exhaust.
- CHE working both on-terminal and handling China Shipping-related containers at the on-dock rail yard. CHE emission sources include engine exhaust.
- Trucks idling at the in-gate, out-gate, and on-terminal; driving on-terminal; and driving off-terminal along the primary truck routes. Truck emission sources include engine exhaust, tire wear, brake wear, and road dust.
- Worker vehicles driving both on- and off-terminal. Worker vehicle emission sources include engine exhaust, tire wear, brake wear, and road dust.

2.2 Derivation of Emissions for the Pollutant Averaging Periods

Section 3.1.4.1 of the RSEIR and Appendix B1 describe the methodology for estimating annual, peak day, peak 8-hour, and peak 1-hour emissions associated with terminal operations. In general, peak day emissions were calculated for each source category (container ships, tugboats, locomotives, CHE, trucks, and worker vehicles) based on expected maximum daily activity levels within the annual period being modeled. Peak 1-hour and 8-hour emissions for CHE, trucks, and worker vehicles were calculated internally by AERMOD using peak day emissions and hour-of-day activity profiles described in Section 3.1.4. Peak 1-hour and 8-hour emissions for container ships, tugboats, and locomotives were calculated outside of AERMOD as described in Appendix B1 and modeled directly in AERMOD.

3.0 Dispersion Modeling Approach

3.1 Dispersion Model Selection and Inputs

Air dispersion modeling was performed using the USEPA AERMOD dispersion model, version 24142 (USEPA 2024), based on the *Guideline on Air Quality Models* (USEPA, 2024b) and SCAQMD Modeling Guidance for AERMOD (SCAQMD, 2024). AERMOD is a steady-state, multiple source, Gaussian dispersion model designed for applications which include areas of ground elevations that exceed emission source stack heights. AERMOD is well suited for this analysis because it is (1) accepted by the modeling community and regulatory agencies due to of its ability to provide reasonable results for large industrial projects with multiple emission sources, (2) annual sets of hourly meteorological data are available in AERMOD format, and (3) the model can handle various sources types, including point, area, line, and volume. Finally, AERMOD has been approved by the USEPA and SCAQMD for analysis of mobile sources.

3.1.1 Emission Source Modeling Representation

Operational emission sources were represented in AERMOD as follows:

- Container ships in transit were simulated as a series of separated volume sources extending from Berths 100 and 102 to the South Coast Air Basin (SCAB) overwater boundary. Volume source spacing was 100 meters within the harbor, 500 meters in the precautionary zone, 1,000 meters between the precautionary zone and 20 nautical miles from Point Fermin, and 2,000 meters between 20 nautical miles and the SCAB overwater boundary. Transit emissions were apportioned 75 percent to the north trans-Pacific route, and 25 percent to the west route, based on arrival and departure statistics for the terminal (Ramboll, T. Olevski, personal communication, December 27, 2016).
- Container ships at berth were modeled as point sources located adjacent to Berths 100 and 102.
- Container ships at anchorage were modeled as an area source within the harbor.
- Tugboats were modeled as a series of separated volume sources extending from Berths 100 and 102 to the Port breakwater. The volume source spacing was 100 meters.
- Locomotives were modeled as a series of contiguous line sources along the arriving and departing routes as well as within the on-dock rail yard. Locomotives were modeled as far north as Sepulveda Blvd, about 4.5 miles northeast of the terminal. A sensitivity AERMOD run showed that this range was sufficient to adequately capture maximum pollutant concentrations.
- CHE was modeled as area sources positioned over most of the terminal and the on-dock rail yard.
- Trucks driving and idling on-site were modeled as area sources positioned over the in-gate, out-gate, and terminal.
- Trucks and worker vehicles driving off-site were modeled a series of contiguous line sources along the primary travel routes. They were modeled as far north as Sepulveda Blvd, about 4.5 miles northeast of the terminal. A sensitivity AERMOD run showed that this range was sufficient to adequately capture maximum pollutant concentrations.

- Worker vehicles on-site were modeled as area sources positioned over the entrance roads and on-terminal parking lots.

Table B2-1 presents the source parameters used in the dispersion modeling of operational emissions. The source parameters are consistent with those developed and used in prior LAHD NEPA/CEQA documents for container terminals, including the 2008 EIS/EIR for the China Shipping Container Terminal (LAHD 2008; LAHD 2011; LAHD 2014). The locations of the emission sources as modeled are shown in Figures B2-1 through B2-3.

Table B2-1. AERMOD Source Parameters

Source Description	AERMOD Source Type	Release Height (m) [a]	Initial Vertical Dimension (m) [b]	Stack Exit Velocity (m/s)	Stack Exit Temp. (K)	Stack Inside Diameter (m)
Ships – Fairway and Precautionary Area Transit	Volume	49.1	11.4	--	--	--
Ships – Harbor Transit	Volume	59.1	13.7	--	--	--
Ships – Turning and Docking Near-Berth	Volume	78.6	18.3	--	--	--
Ships - At Berth - Auxiliary Engines	Point	44.5	--	7.5	583	0.539
Ships - At Berth – Boilers	Point	39.9	--	18.24	559	0.494
Ships - At Anchorage	Area	44.5	10.3	--	--	--
Tugboats	Volume	15.2	3.5	--	--	--
Locomotives - Offsite – Day [c]	Line	5.6	2.6	--	--	--
Locomotives - Offsite – Night	Line	14.6	6.79	--	--	--
Locomotives - Onsite – Day	Line	6.64	3.08	--	--	--
Locomotives - Onsite – Night	Line	13.56	6.31	--	--	--
Cargo Handling Equipment (except RTGs)	Area	4.57	1.06	--	--	--
Rubber Tired Gantry (RTG) Cranes	Area	12.5	2.9	--	--	--
Trucks	Area, Line [d]	4.57	1.06	--	--	--
Worker Vehicles	Area, Line [d]	0.61	0.14	--	--	--

Notes:

a. The release height for point sources in this table represents the actual release height of the exhaust above ground (or water, in this case). AERMOD then accounts for additional plume rise due to the upward momentum and buoyancy of the stack exhaust gas, based on the exit velocity, exit temperature, and stack diameter. By contrast, AERMOD does not calculate any additional plume rise for volume, area, and line sources. Therefore, the release heights presented in this table for volume, area, and line sources have been adjusted higher than the actual exhaust release heights in many cases to account for plume rise due to upward momentum and buoyancy of the stack exhaust gas.

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

c. Locomotive plume heights were derived from the *Roseville Rail Yard Study* (CARB, 2004). The plume heights vary by day versus night due to differences in atmospheric stability conditions. The line source release heights were set equal to the plume heights because line sources do not have a plume rise algorithm in AERMOD.

d. Trucks and worker vehicles were modeled with area sources on-site and line sources off-site.

e. Source parameters are consistent with prior LAHD CEQA documents for container terminals (LAHD 2008; LAHD 2011; LAHD 2014).

Figure B2-1. AERMOD Source Representation – Ship (OGV) Transits

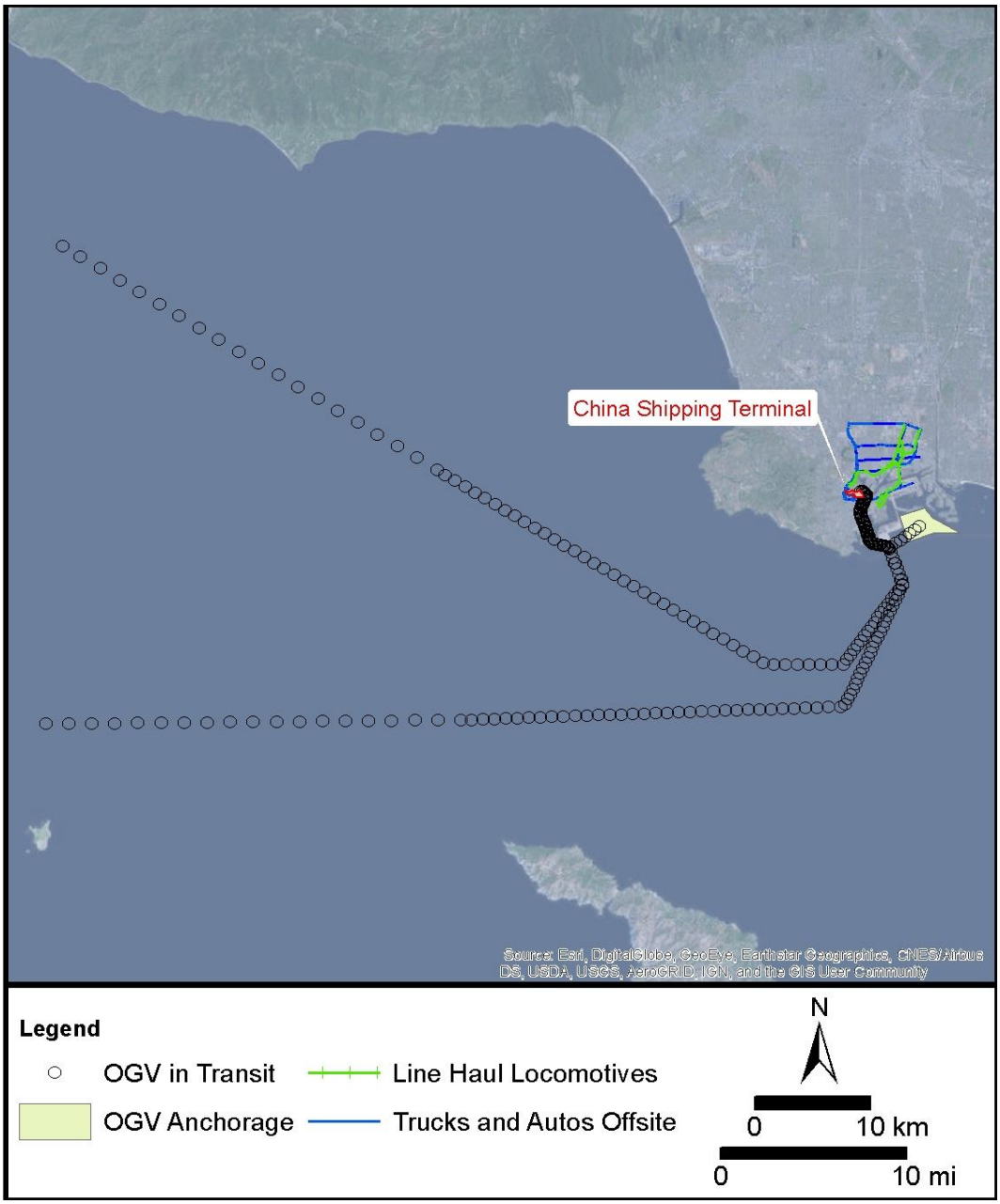


Figure B2-2. AERMOD Source Representation – OGV Maneuvering and Anchorage, Off-site Line Haul Locomotives, and Off-site Trucks and Worker Vehicles

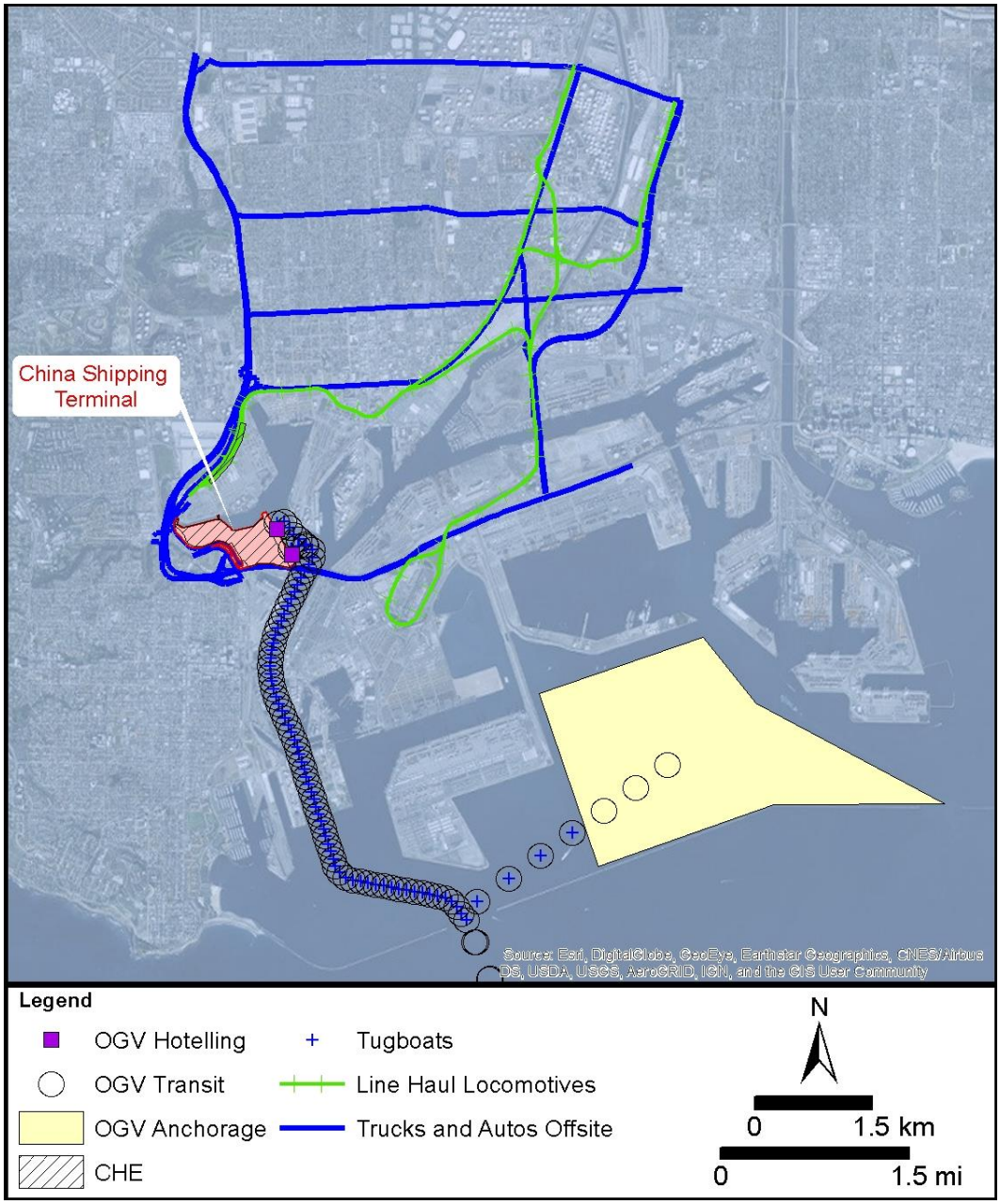
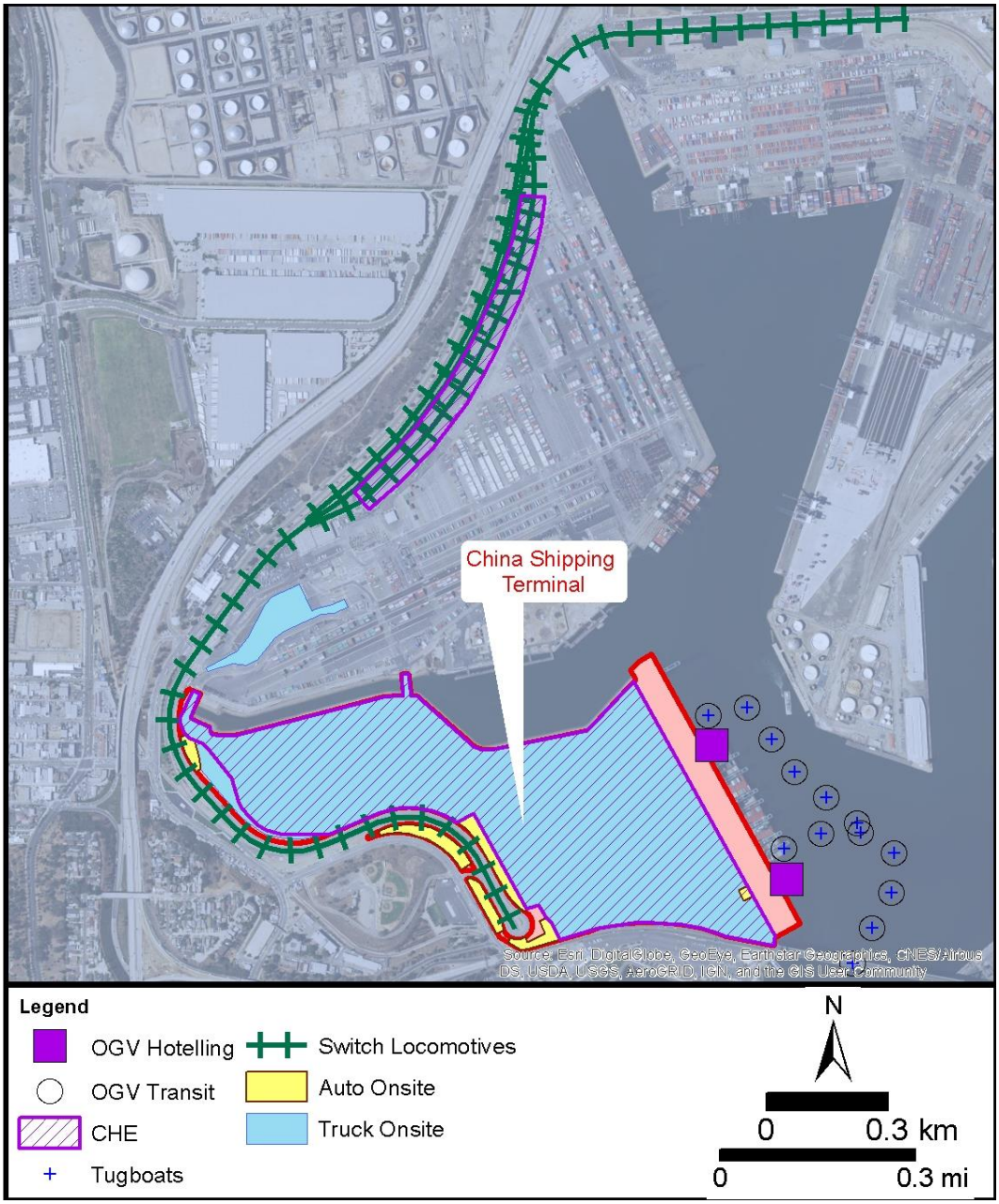


Figure B2-3. AERMOD Source Representation – OGV Hoteling, CHE, On-site Trucks and Worker Vehicles, and Switch Locomotives



3.1.2 Meteorological Data

The complex interaction of the ocean, land, and Palos Verdes hills near the Port may result in significant variations in wind patterns over relatively short distances (LAHD 2010). POLA and POLB currently operate monitoring stations that collect meteorological data from several locations within and near port boundaries. For this dispersion analysis, the meteorological data collected at the Wilmington Community Station, located at Saints Peter and Paul School, were used for dispersion modeling. The station is located about 1.6 mile north of the China Shipping terminal and is considered the most representative meteorological station for the terminal in accordance with the "Sphere of Influence" analysis conducted by POLA and POLB in 2010 (LAHD 2010).

The meteorological data used in AERMOD were collected between January 1, 2012 and December 31, 2016. The use of five years of meteorological data is consistent with USEPA guidelines, which state that "at least one year of site-specific" data are required and "if 1 year or more, up to 5 years, of site-specific data are available, these data are preferred for use in air quality analyses." (USEPA, 2024b). For project-to-project consistency, this same meteorological period (i.e., 2012-2016) has been used in numerous POLA and POLB environmental documents since 2019. The meteorological data were processed in 2019 using the USEPA's approved AERMET (version 16216) meteorological data preprocessor (USEPA 2016).

3.1.3 Model Options

Regulatory default technical options were selected in AERMOD for all pollutants. Consistent with SCAQMD and EPA guidance (SCAQMD 2024; USEPA 2024b), the conversion of nitrogen oxide (NO_X) to NO_2 in ambient air was simulated in AERMOD using the Ambient Ratio Method 2 (ARM2). U.S. EPA default values of 0.5 and 0.9 were used for the minimum and maximum NO2/NOx ratios in ARM2.

As recommended by the SCAQMD (2024), all sources were modeled with urban dispersion coefficients. An urban population of 9,663,345, representative of Los Angeles County, was used in AERMOD. Receptor and source base elevations were determined from USGS 1/3-arcsecond National Elevation Dataset (NED) files using AERMAP, version 24142 (USEPA 2024c). All coordinates were referenced to UTM NAD83, Zone 11.

3.1.4 Temporal Distribution Assumptions

For dispersion modeling purposes, operational emissions were assumed to occur during the times specified in Table B2-2. Emissions were assumed to be uniformly distributed during the specific time periods described in the table. The same temporal distribution assumptions were used for all modeled project scenarios.

Table B2-2. Temporal Distribution of Emissions in AERMOD

Source Description	Temporal Distribution	
Container Ships	24 hours per day	
Tugboats	24 hours per day	
Locomotives	24 hours per day	
Cargo Handling Equipment [a]	10.0 percent 12 a.m. – 6 a.m. 25.0 percent 6 a.m. – 12 p.m. 32.5 percent 12 p.m. – 6 p.m. 32.5 percent 6 p.m. – 12 a.m.	
Trucks [b]	4.46 percent 12 a.m. – 1 a.m. 3.50 percent 1 a.m. – 2 a.m. 1.33 percent 2 a.m. – 3 a.m. 0.38 percent 3 a.m. – 4 a.m. 0.38 percent 4 a.m. – 5 a.m. 0.42 percent 5 a.m. – 6 a.m. 0.46 percent 6 a.m. – 7 a.m. 1.13 percent 7 a.m. – 8 a.m. 5.38 percent 8 a.m. – 9 a.m. 6.08 percent 9 a.m. – 10 a.m. 6.00 percent 10 a.m. – 11 a.m. 6.38 percent 11 a.m. – 12 p.m.	5.21 percent 12 p.m. – 1 p.m. 7.04 percent 1 p.m. – 2 p.m. 6.67 percent 2 p.m. – 3 p.m. 6.21 percent 3 p.m. – 4 p.m. 4.54 percent 4 p.m. – 5 p.m. 2.63 percent 5 p.m. – 6 p.m. 5.96 percent 6 p.m. – 7 p.m. 6.25 percent 7 p.m. – 8 p.m. 5.63 percent 8 p.m. – 9 p.m. 5.25 percent 9 p.m. – 10 p.m. 3.54 percent 10 p.m. – 11 p.m. 5.21 percent 11 p.m. – 12 a.m.
Worker Vehicles	Same distribution as trucks	

Notes:
[a] The temporal distribution for CHE was derived from the truck distribution since a correlation exists between cargo handling and drayage truck visits. The truck factors were grouped into four 6-hour blocks to give less hour-by-hour variability than trucks because of a more steady-state workforce operating the cargo handling equipment.
[b] The temporal distribution for trucks was provided by the traffic study.

3.1.5 Receptor Locations

Cartesian coordinate receptor grids were used to provide adequate spatial coverage surrounding the Project area to assess ground-level pollution concentrations, identify the extent of impacts, and identify maximum impact locations. Initial AERMOD runs were conducted with a 20 by 12 kilometer (km) coarse grid, with receptors placed 2,000 meters (m) apart, centered over the Project site. Embedded within this receptor grid were additional receptors, placed 1,000 m apart, covering an area 8 km x 11 km. Also embedded were additional receptors, placed 250 m apart, covering an area 7 km x 10 km in which maximum concentrations were anticipated to occur.

Once the locations of the maximum concentrations were identified on the aforementioned coarse grid, additional AERMOD runs were conducted with grids of receptors, placed 50 m apart, centered over locations of the maximum coarse grid concentrations and along the China Shipping Terminal boundary. Receptors over water and in modeled roadway and rail traffic lanes were not considered in determining the maximum receptor locations because any human exposure there would be brief and transient. A total of 1,178 coarse and fine grid receptors were modeled in AERMOD.

Figures B2-4 and B2-5 show the receptor grids used in AERMOD for criteria pollutants.

Figure B2-4. AERMOD Fine and Coarse Grid Receptors (Far Field)

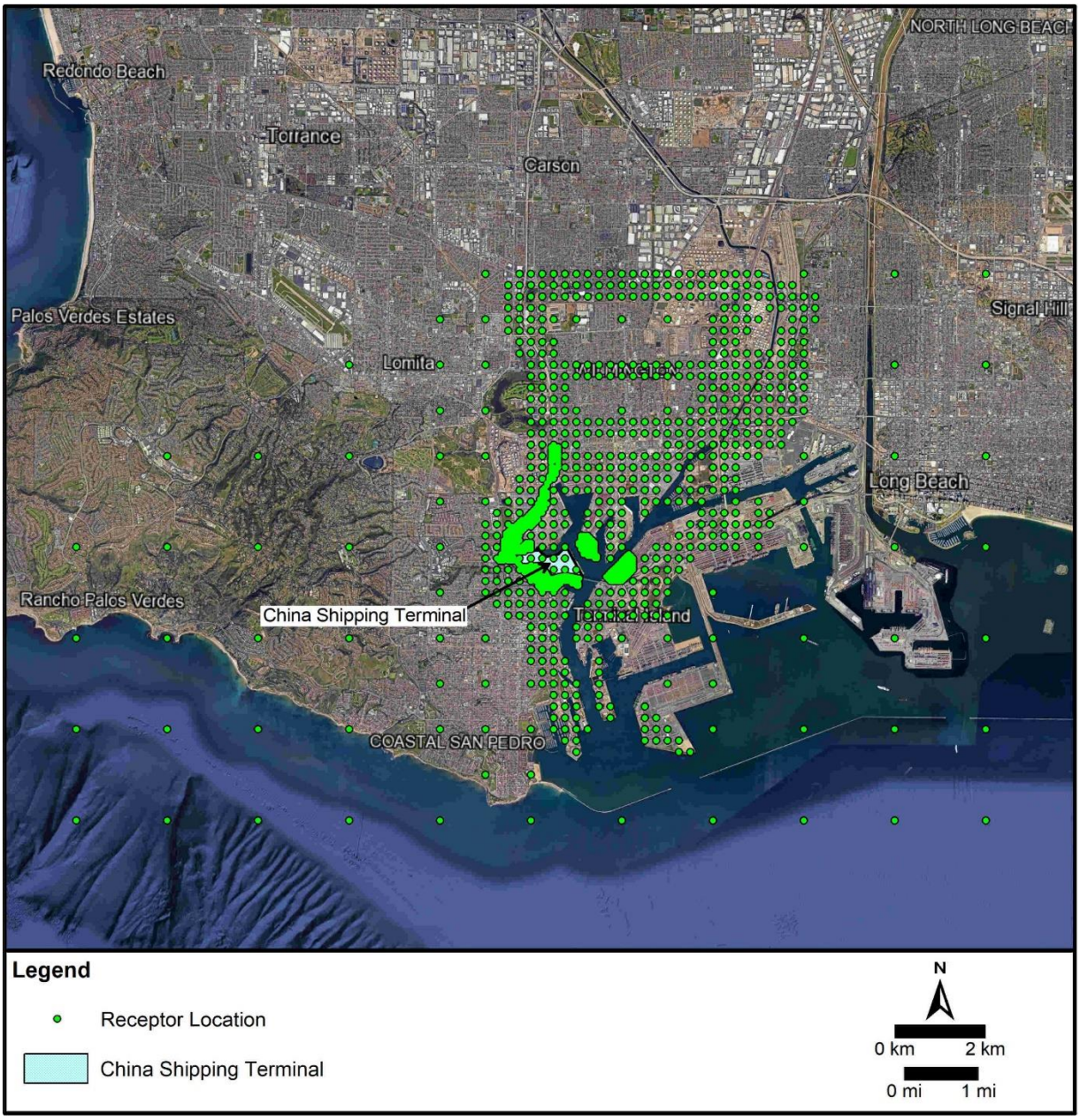
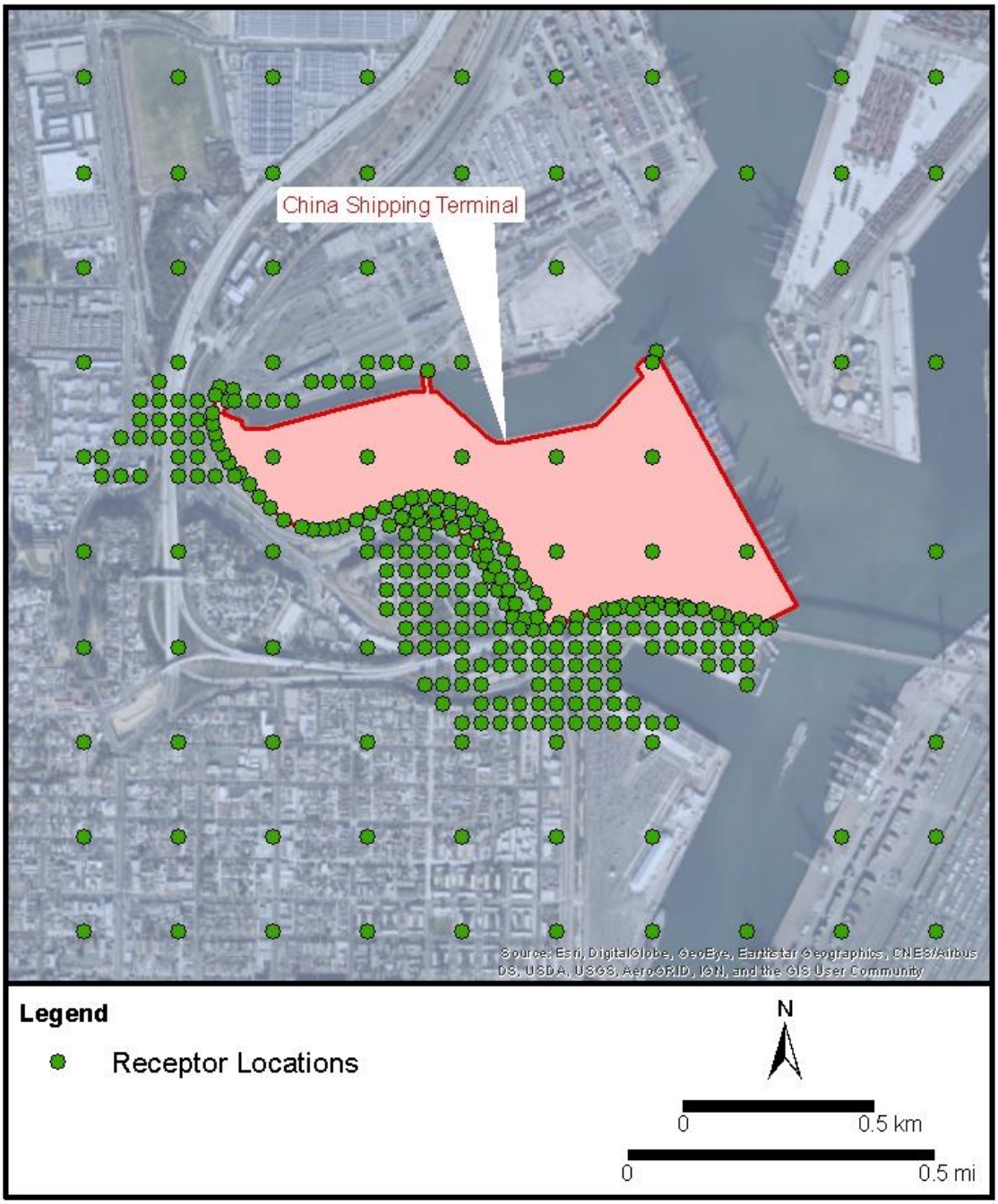


Figure B2-5. AERMOD Fine and Coarse Grid Receptors (Near Field)



3.2 Methodology for Determination of Impacts

NO_2, PM_{10} and $PM_{2.5}$ concentrations associated with the Revised Project and FEIR Mitigated Scenario were modeled for each analysis year (2012, 2014, 2018, 2019, 2020, 2021, 2022, 2023, 2026, 2036, and 2045). Because prior Port projects have shown that SO_2 and CO are unlikely to exceed the significance thresholds, a conservative screening approach was used for SO_2 and CO where each AERMOD source was modeled with its maximum emissions over all analysis years. Thus, single worst case emission scenarios were modeled for CO and SO_2, whereas individual analysis years were modeled for NO_2, $PM_{2.5}$ and PM_{10}. The pollutant concentrations modeled by AERMOD were compared to the significance thresholds in Table B2-3 to assess impacts.

Table B2-3: SCAQMD Significance Thresholds for Operations

Air Pollutant	Operation Ambient Concentration Threshold
Nitrogen Dioxide (NO_2)[a]	
1-hour average (federal)[b]	0.100 ppm (188 µg/m^3)
1-hour average (state)	0.18 ppm (339 µg/m^3)
Annual average (federal)[c]	0.0534 ppm (100 µg/m^3)
Annual average (state)	0.030 ppm (57 µg/m^3)
Sulfur Dioxide (SO_2)[a]	
1-hour average (federal)[d]	0.075 ppm (196 µg/m^3)
1-hour average (state)	0.25 ppm (655 µg/m^3)
24-hour average	0.04 ppm (105 µg/m^3)
Carbon Monoxide (CO)[a]	
1-hour average	20 ppm (23,000 µg/m^3)
8-hour average	9.0 ppm (10,000 µg/m^3)
Particulates (PM_{10} or $PM_{2.5}$)[e]	
24-hour average (PM_{10} and $PM_{2.5}$)	2.5 µg/m^3
Annual average (PM_{10} only)	1.0 µg/m^3

Notes:

[a] The NO_2, SO_2, and CO thresholds are absolute thresholds; the maximum predicted Project concentration increment is added to the background concentration and compared to the threshold.

[b] This analysis included the use of both the current SCAQMD NO_2 threshold (0.18 ppm), which is the state standard, and the newer federal 1-hour ambient air quality standard (0.100 ppm). To attain the federal standard, the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour averages must not exceed 0.100 ppm.

[c] For the purpose of determining significance, the more stringent annual state NO_2 standard of 57 µg/m^3 was used instead of the less stringent annual federal standard.

[d] To attain the SO_2 federal 1-hour standard, the 3-year average of the 99th percentile of the annual distribution of daily maximum 1-hour averages must not exceed 0.075 ppm. This analysis conservatively used the highest modeled 1-hour SO_2 concentration.

[e] The PM_{10} and $PM_{2.5}$ thresholds are incremental thresholds; the maximum Project concentration increment relative to the 2008 Actual Baseline is compared to these thresholds without adding a background concentration.

Sources:

SCAQMD (2023); USEPA (2024d).

3.2.1 Methodology for NO_2, SO_2, and CO

The significance concentration thresholds for NO_2, SO_2, and CO are absolute thresholds based on the ambient air quality standards. Therefore, the Project's modeled pollutant concentration increments were added to ambient background concentrations to yield total concentrations. The significance of NO_2, SO_2, and CO impacts was determined by comparing the modeled receptors with the greatest total concentrations to the significance thresholds. This approach for determining total concentrations was endorsed by the SCAQMD (T. Chico, personal communication, May 10, 2012; I. MacMillan, personal communication, April 18, 2012).

The Project's modeled concentration increments were obtained by modeling each AERMOD source's emission increase relative to the 2008 Baseline (i.e., each source's analysis year emission rate minus the source's 2008 baseline emission rate). AERMOD sources with emission decreases were modeled with zero emissions.

To be consistent with the federal 1-hour NO_2 standard, the modeled federal 1-hour NO_2 concentration increments represent the 98th percentile (8th highest) of the annual distribution of daily maximum 1-hour concentrations, averaged over the five years of meteorological data. Although compliance with the federal 1-hour NO_2 standard is based on a three-year average of the 98th percentile 1-hour concentrations, the EPA states that, "the 5-year average based on use of NWS data, or an average across one or more years of available site specific data, serves as an unbiased estimate of the 3-year average for purposes of modeling demonstrations of compliance with the NAAQS" (EPA, 2010). All other modeled pollutant concentrations, including the state 1-hour NO_2 concentration, represent the highest concentrations over the entire five years of meteorological data.

The background concentration represents the maximum ambient pollutant concentration in the vicinity of the Project site, excluding the incremental contribution from the Project. Ambient background concentrations were obtained from the Port's Wilmington Community Station at Saints Peter and Paul School. This air monitoring station is part of the Port's site-specific monitoring network and therefore captures contributions to ambient air pollutant levels from the Port including the existing China Shipping Terminal.

For NO_2, the three most recent years of monitoring data, 2021-2023[1], were used to determine the background concentrations for the modeled analysis years 2023 through 2045. For analysis years 2012 through 2022, the three years of monitoring data leading up to and including the analysis year were used to determine the background concentrations. For example, 2010-2012 monitoring data were used as background for analysis year 2012, 2012-2014 monitoring data were used as background for analysis year 2014, and so on. Because SO_2 and CO were conservatively modeled with each source's maximum emission increments over all analysis years, the background concentrations used in the analysis were also the highest monitored concentrations from 2010 to 2023. Tables B2-4 through B2-11 show the derivation of the background concentrations used in this analysis.

It should be noted that the maximum predicted NO_2, SO_2, and CO concentrations, which consist of the Project concentration increments predicted by AERMOD plus the background concentrations measured at the Wilmington Community Station, are conservative (over-predicted) because the background concentrations were measured while the Revised Project was already operational. Therefore, the background concentrations

[1] Each "year" of ambient monitoring data represents the 12-month period beginning May of the indicated year. For example, "2010" represents May 2010 - April 2011, "2011" represents May 2011 - April 2012, etc.

already include some contribution from the Revised Project, which means the Revised Project's concentration increments may be double counted to some degree.

Table B2-4. Background Concentrations for Analysis Year 2012

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2010	2011	2012	(ppm)	(µg/m^3) [e]
NO_2	State 1-Hour	0.098	0.091	0.078	0.098	185
	Federal 1-Hour [b]	0.079	0.080	0.062	0.074	139
	Annual	0.021	0.021	0.016	0.021	40
CO	1-Hour	4.6	5.0	4.7	5.0	5,740
	8-Hour	2.7	3.0	2.5	3.0	3,444
SO_2	State 1-Hour	0.046	0.029	0.028	0.046	121
	Federal 1-Hour [c]	0.030	0.024	0.016	0.023	61
	24-Hour	0.009	0.009	0.006	0.009	24

Notes:

[a] All concentrations were measured at the Wilmington Community Monitoring Station. Values represent the highest observed concentration during the year unless otherwise noted. The indicated years represent the 12-month period beginning May 1 of the indicated year and continuing to April 30 of the following year.

[b] The federal 1-hour NO_2 concentration for each year represents the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations.

[c] The federal 1-hour SO_2 concentration for each year represents the 99th percentile of the annual distribution of daily maximum 1-hour average concentrations.

[d] The background concentrations for federal 1-hour NO_2 and federal 1-hour SO_2 are averages of the three reported years. The background concentrations for all other pollutants and averaging periods are maximums of the three reported years.

[e] The concentration in micrograms per cubic meter (µg/m^3) is calculated as follows: µg/m^3 = ppm x MW / 0.0244. The molecular weights (MW) are 28.01 for CO, 46.0055 for NO_2, and 64.066 for SO_2.

[f] Source: POLA (2024).

Table B2-5. Background Concentrations for Analysis Year 2014

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2012	2013	2014	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.078	0.092	0.085	0.092	173
	Federal 1-Hour [b]	0.062	0.074	0.066	0.067	127
	Annual	0.016	0.018	0.017	0.018	34
CO	1-Hour	4.7	4.0	3.8	4.7	5,395
	8-Hour	2.5	2.9	2.5	2.9	3,329
SO_2	State 1-Hour	0.028	0.050	0.027	0.050	131
	Federal 1-Hour [c]	0.016	0.015	0.018	0.016	43
	24-Hour	0.006	0.006	0.005	0.006	16

See Table B2-4 for notes.

Table B2-6. Background Concentrations for Analysis Year 2018

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2016	2017	2018	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.087	0.076	0.063	0.087	164
	Federal 1-Hour [b]	0.066	0.066	0.051	0.061	115
	Annual	0.015	0.013	0.012	0.015	28
CO	1-Hour	3.4	3.8	4.2	4.2	4,821
	8-Hour	2.2	2.3	2.2	2.3	2,640
SO_2	State 1-Hour	0.038	0.052	0.047	0.052	137
	Federal 1-Hour [c]	0.016	0.019	0.026	0.020	53
	24-Hour	0.004	0.009	0.007	0.009	24

See Table B2-4 for notes.

Table B2-7. Background Concentrations for Analysis Year 2019

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2017	2018	2019	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.076	0.063	0.068	0.076	143
	Federal 1-Hour [b]	0.066	0.051	0.051	0.056	106
	Annual	0.013	0.012	0.008	0.013	25
CO	1-Hour	3.8	4.2	2.7	4.2	4,821
	8-Hour	2.3	2.2	1.6	2.3	2,640
SO_2	State 1-Hour	0.052	0.047	0.024	0.052	137
	Federal 1-Hour [c]	0.019	0.026	0.012	0.019	50
	24-Hour	0.009	0.007	0.008	0.009	24

See Table B2-4 for notes.

Table B2-8. Background Concentrations for Analysis Year 2020

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2018	2019	2020	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.063	0.068	0.071	0.071	134
	Federal 1-Hour [b]	0.051	0.051	0.060	0.054	102
	Annual	0.012	0.008	0.013	0.013	25
CO	1-Hour	4.2	2.7	3.0	4.2	4,821
	8-Hour	2.2	1.6	2.0	2.2	2,525
SO_2	State 1-Hour	0.047	0.024	0.021	0.047	123
	Federal 1-Hour [c]	0.026	0.012	0.011	0.016	43
	24-Hour	0.007	0.008	0.003	0.008	21

See Table B2-4 for notes.

Table B2-9. Background Concentrations for Analysis Year 2021

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2019	2020	2021	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.068	0.071	0.060	0.071	134
	Federal 1-Hour [b]	0.051	0.060	0.053	0.055	103
	Annual	0.008	0.013	0.014	0.014	26
CO	1-Hour	2.7	3.0	7.7	7.7	8,839
	8-Hour	1.6	2.0	2.2	2.2	2,525
SO_2	State 1-Hour	0.024	0.021	0.010	0.024	63
	Federal 1-Hour [c]	0.012	0.011	0.009	0.011	28
	24-Hour	0.008	0.003	0.007	0.008	21

See Table B2-4 for notes.

Table B2-10. Background Concentrations for Analysis Year 2022

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2020	2021	2022	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.071	0.060	0.052	0.071	134
	Federal 1-Hour [b]	0.060	0.053	0.044	0.052	99
	Annual	0.013	0.014	0.013	0.014	26
CO	1-Hour	3.0	7.7	5.1	7.7	8,839
	8-Hour	2.0	2.2	2.4	2.4	2,755
SO_2	State 1-Hour	0.021	0.010	0.008	0.021	55
	Federal 1-Hour [c]	0.011	0.009	0.006	0.009	23
	24-Hour	0.003	0.007	0.002	0.007	18

See Table B2-4 for notes.

Table B2-11. Background Concentrations for Analysis Years 2023 to 2045

Pollutant	Averaging Period	Monitored Concentration (ppm) [a,f]			Background Concentration [d]	
		2021	2022	2023	(ppm)	(µg/m³) [e]
NO_2	State 1-Hour	0.060	0.052	0.053	0.060	113
	Federal 1-Hour [b]	0.053	0.044	0.045	0.047	89
	Annual	0.014	0.013	0.012	0.014	26
CO	1-Hour	7.7	5.1	3.0	7.7	8,839
	8-Hour	2.2	2.4	1.9	2.4	2,755
SO_2	State 1-Hour	0.010	0.008	0.160	0.160	420
	Federal 1-Hour [c]	0.009	0.006	0.007	0.007	19
	24-Hour	0.007	0.002	0.013	0.013	34

See Table B2-4 for notes.

3.2.2 Methodology for PM_{10} and $PM_{2.5}$

The significance concentration thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds. Therefore, impacts were determined by modeling the Project's concentration increments and comparing the maximum increments directly to the corresponding significance thresholds without adding background concentrations. The Project's modeled concentration increments were obtained by modeling each AERMOD source's emission increase relative to the 2008 Baseline (i.e., each source's analysis year emission rate minus the source's 2008 baseline emission rate). AERMOD sources with emission decreases were modeled with zero emissions.

4.0 Predicted Air Quality Impacts

4.1 Revised Project

Table B2-12 presents the maximum off-site NO_2 concentration impacts associated with the Revised Project in each analysis year. Results show that impacts would exceed the federal 1-hour NO_2 significance threshold in 2012, 2014, 2018, 2020, 2021, 2022, 2023, and 2026; the state 1-hour NO_2 threshold in 2014, 2021, 2022, and 2023; and the annual NO_2 threshold in 2014, 2021, 2022, and 2023.

Table B2-13 presents the maximum off-site SO_2 and CO concentration impacts associated with the Revised Project. Because prior Port projects have shown that SO_2 and CO are unlikely to exceed the significance thresholds, a conservative screening approach was used for SO_2 and CO where each AERMOD source was modeled with its maximum emission increment over all analysis years. The screening results show that impacts would be below the SO_2 and CO significance thresholds in all analysis years.

Table B2-14 presents the maximum off-site PM_{10} and $PM_{2.5}$ concentration increments associated with the Revised Project in each analysis year. Results show that impacts would exceed the 24-hour PM_{10} significance threshold in 2012, 2014, 2020, 2021, 2022, 2023, 2026, 2036, and 2045; the annual PM_{10} significance threshold in 2014, 2020, 2021, 2022, 2023, 2026, 2036, and 2045; and the $PM_{2.5}$ significance threshold in 2022 and 2023.

Table B2-12. Maximum Off-Site Ambient NO_2 Concentrations Associated with the Revised Project

Pollutant	Averaging Period	Analysis Year	Background Concentration (µg/m³)[c]	Maximum Modeled Project Concentration Increment (µg/m³)[d]	Total Concentration (µg/m³)[a,e]	Significance Threshold (µg/m³)	Threshold Exceeded?
NO_2[b]	Federal 1-hour	2012	139	120.4	**259**	188	**Yes**
		2014	127	318.4	**445**	188	**Yes**
		2018	115	122.2	**237**	188	**Yes**
		2019	106	63.8	170	188	No
		2020	102	104.3	**206**	188	**Yes**
		2021	103	303.5	**406**	188	**Yes**
		2022	99	336.0	**435**	188	**Yes**
		2023	89	210.5	**299**	188	**Yes**
		2026	89	143.1	**232**	188	**Yes**
		2036	89	29.7	119	188	No
		2045	89	24.8	114	188	No
	State 1-hour	2012	185	128.1	313	339	No
		2014	173	365.9	**539**	339	**Yes**
		2018	164	128.7	293	339	No
		2019	143	77.2	220	339	No
		2020	134	113.5	248	339	No
		2021	134	355.4	**489**	339	**Yes**
		2022	134	395.9	**530**	339	**Yes**
		2023	113	243.2	**356**	339	**Yes**
		2026	113	166.7	280	339	No
		2036	113	36.1	149	339	No
		2045	113	28.5	142	339	No
	Annual	2012	40	15.2	55	57	No
		2014	34	49.0	**83**	57	**Yes**
		2018	28	16.1	44	57	No
		2019	25	7.2	32	57	No
		2020	25	11.9	37	57	No
		2021	26	48.5	**75**	57	**Yes**
		2022	26	51.3	**77**	57	**Yes**
		2023	26	36.6	**63**	57	**Yes**
		2026	26	24.8	51	57	No
		2036	26	4.2	30	57	No
		2045	26	1.5	28	57	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The federal 1-hour NO_2 modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations averaged over five years of meteorological data. The state 1-hour NO_2 modeled concentration represents the maximum concentration.

[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).

[d] The Modeled Project Concentration Increment represents the modeled emission increases of the Revised Project relative to the 2008 Actual Baseline.

[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.

Table B2-13. Maximum Off-Site Ambient SO2 and CO Concentrations Associated with the Revised Project

Pollutant	Averaging Period	Background Concentration (µg/m³)[b]	Maximum Modeled Project Concentration Increment (µg/m³)[c]	Total Concentration (µg/m³)[a,d]	Significance Threshold (µg/m³)	Threshold Exceeded?
SO_2	Federal 1-hour	61	2.9	64	196	No
	State 1-hour	420	2.9	423	655	No
	24-hour	34	0.4	34	105	No
CO	1-hour	8,839	2,497	11,336	23,000	No
	8-hour	3,444	1,824	5,268	10,000	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).

[c] The Modeled Project Concentration Increment represents the modeled emission increases of the Revised Project relative to the 2008 Actual Baseline.

[d] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.

Table B2-14. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentration Increments Associated with the Revised Project

Pollutant	Averaging Period	Analysis Year	Maximum Modeled Project Concentration Increment ($\mu g/m^3$)[a,b,c]	Significance Threshold ($\mu g/m^3$)	Threshold Exceeded?
PM_{10}	24-hour	2012	**2.6**	2.5	**Yes**
		2014	**7.8**	2.5	**Yes**
		2018	2.1	2.5	No
		2019	2.0	2.5	No
		2020	**3.3**	2.5	**Yes**
		2021	**8.2**	2.5	**Yes**
		2022	**10.0**	2.5	**Yes**
		2023	**6.9**	2.5	**Yes**
		2026	**7.3**	2.5	**Yes**
		2036	**11.2**	2.5	**Yes**
		2045	**10.3**	2.5	**Yes**
	Annual	2012	0.8	1.0	No
		2014	**2.4**	1.0	**Yes**
		2018	0.7	1.0	No
		2019	0.7	1.0	No
		2020	**1.2**	1.0	**Yes**
		2021	**2.8**	1.0	**Yes**
		2022	**3.0**	1.0	**Yes**
		2023	**2.1**	1.0	**Yes**
		2026	**2.3**	1.0	**Yes**
		2036	**3.5**	1.0	**Yes**
		2045	**3.2**	1.0	**Yes**
$PM_{2.5}$	24-hour	2012	1.6	2.5	No
		2014	2.4	2.5	No
		2018	0.4	2.5	No
		2019	0.4	2.5	No
		2020	0.7	2.5	No
		2021	2.2	2.5	No
		2022	**3.8**	2.5	**Yes**
		2023	**2.8**	2.5	**Yes**
		2026	1.3	2.5	No
		2036	1.2	2.5	No
		2045	1.1	2.5	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The Modeled Project Concentration Increment represents the modeled emission increases of the Revised Project relative to the 2008 Actual Baseline.

[c] Because the thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds, background concentrations are not added to the Maximum Modeled Project Concentration Increment.

Figures B2-6 and B2-7 show the locations of the maximum modeled concentrations of NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ associated with the Revised Project. The locations in the figures correspond to the concentrations displayed in Tables B2-12, B2-13, and B2-14.

Figure B2-6. Locations of Maximum Modeled Pollutant Concentrations Associated with the Revised Project (far field)

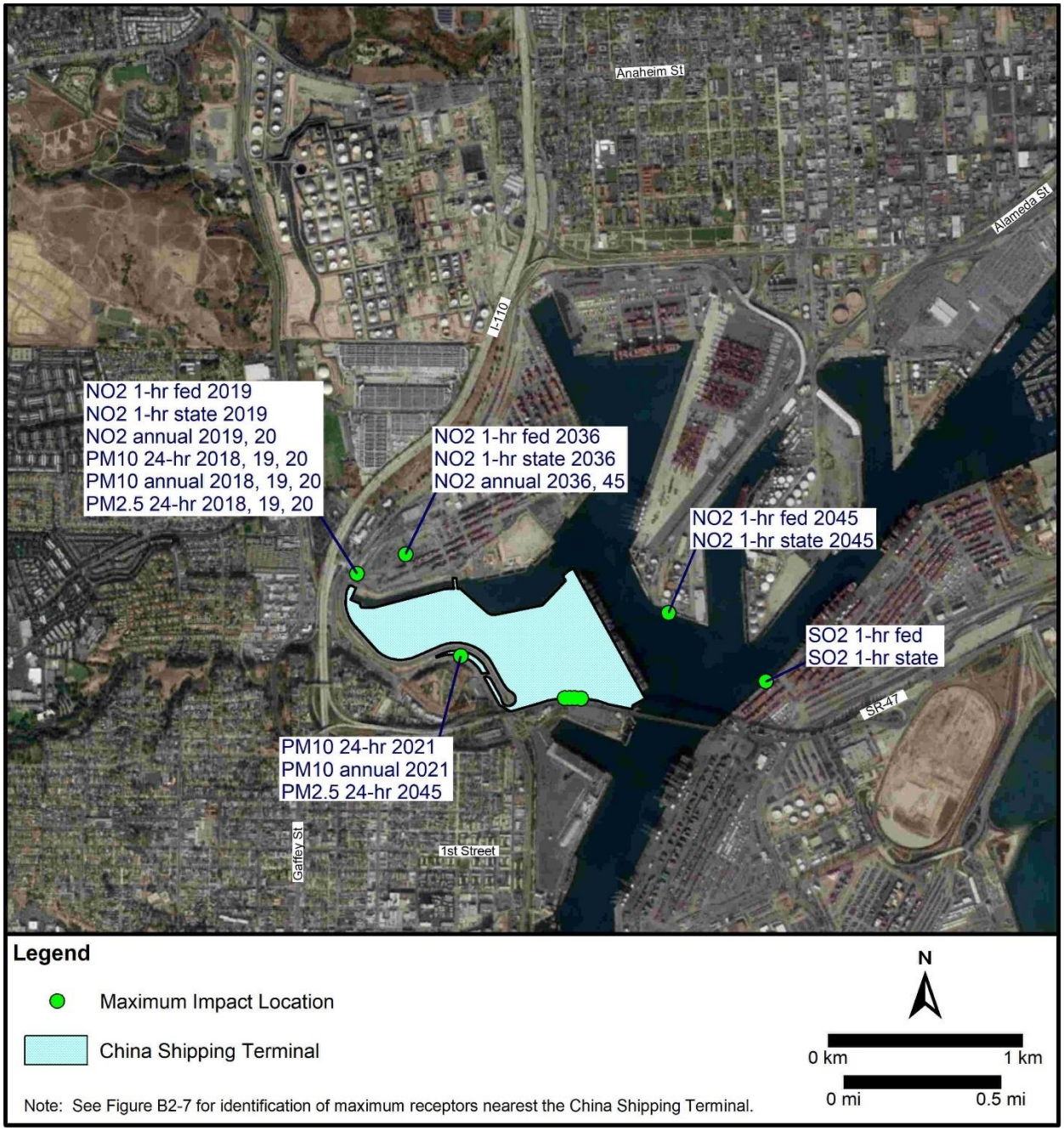


Figure B2-7. Locations of Maximum Modeled Pollutant Concentrations Associated with the Revised Project (near field)

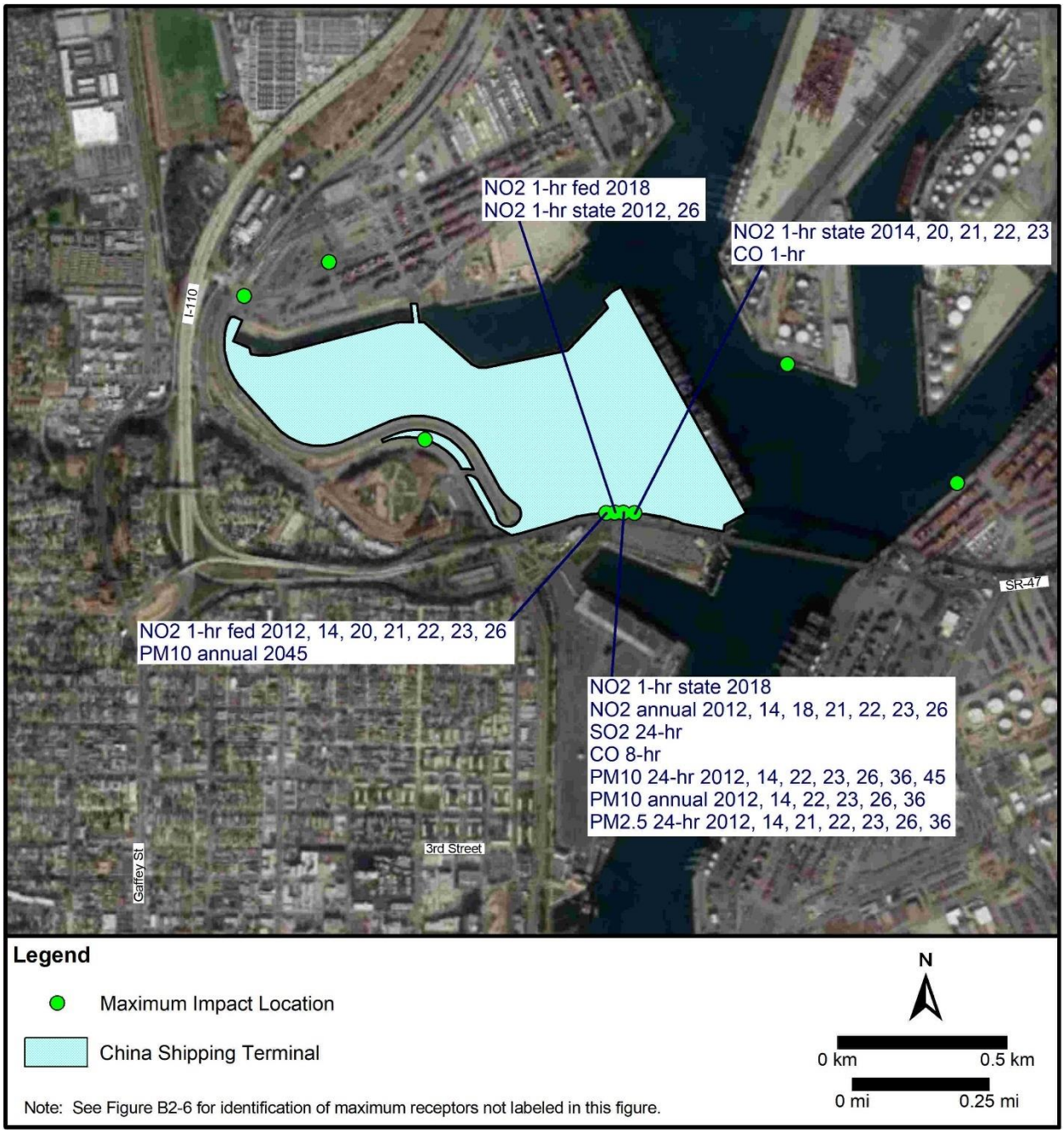


Table B2-15 presents the contributions by source type to the maximum off-site pollutant concentrations associated with the Revised Project. The table presents contributions in the analysis year with the greatest predicted impact for those pollutants and averaging times that would exceed a significance threshold. In the case of the Revised Project, all presented impacts (federal 1-hour, state 1-hour, and annual NO_2; 24-hour and annual PM_{10}; and 24-hour $PM_{2.5}$) would occur in along the southern boundary of the China Shipping terminal, east of Harbor Boulevard. The maximum NO_2 concentrations occurred in analysis year 2014, the maximum PM_{10} concentration increments would occur in analysis year 2036, and the maximum $PM_{2.5}$ concentration increments occurred in analysis year 2022. The table shows that, at this location adjacent to the terminal, CHE is the primary contributor to maximum NO_2 and $PM_{2.5}$ concentrations, while trucks are the primary contributor to maximum PM_{10} concentrations.

Table B2-15. Source Contributions to Maximum Off-Site Pollutant Concentrations Associated with the Revised Project

Source Category	Contribution at the Maximum Off-Site Receptor [a]					
	Federal 1-Hour NO_2	State 1-Hour NO_2	Annual NO_2	24-Hour PM_{10}	Annual PM_{10}	24-Hour $PM_{2.5}$
Ships in Transit	13.4%	15.9%	0.0%	0.0%	0.0%	0.0%
Ships at Berth	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
Ships at Anchorage	2.4%	2.4%	0.1%	0.1%	0.0%	0.0%
Tugboats	7.7%	7.7%	0.1%	0.0%	0.0%	0.0%
Trucks at Gates and On-Terminal	19.8%	22.3%	20.0%	97.4%	96.8%	9.9%
Trucks Driving Off-Terminal	0.5%	0.6%	0.3%	0.9%	0.8%	1.2%
Switch Locomotives	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%
Line Haul Locomotives	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Cargo Handling Equipment	78.6%	76.9%	79.1%	0.6%	0.6%	88.2%
Worker Vehicles	0.0%	0.0%	0.0%	2.1%	1.8%	1.1%

[a] Percentages for 1-Hour and 24-Hour averaging periods add to greater than 100 percent because maximum source contributions do not occur simultaneously.

Figures B2-8 through B2-15 show the areas where the federal 1-hour NO_2 concentrations associated with the Revised Project would exceed the significance threshold. Figures B2-16 through B2-19 show the areas where the state 1-hour NO_2 concentrations associated with the Revised Project would exceed the significance threshold. Figures B2-20 through B2-23 show the areas where the annual NO_2 concentrations associated with the Revised Project would exceed the significance threshold.

Figures B2-24 through B2-32 show the areas where the 24-hour PM_{10} concentration increments associated with the Revised Project would exceed the significance threshold. Figures B2-33 through B2-40 show the areas where the annual PM_{10} concentration increments associated with the Revised Project would exceed the significance threshold.

Figures B2-41 and B2-42 show the areas where the 24-hour $PM_{2.5}$ concentration increments associated with the Revised Project would exceed the significance threshold.

Figure B2-8. Area of Threshold Exceedance for the Revised Project; 2012 Federal 1-Hour NO_2 Concentrations

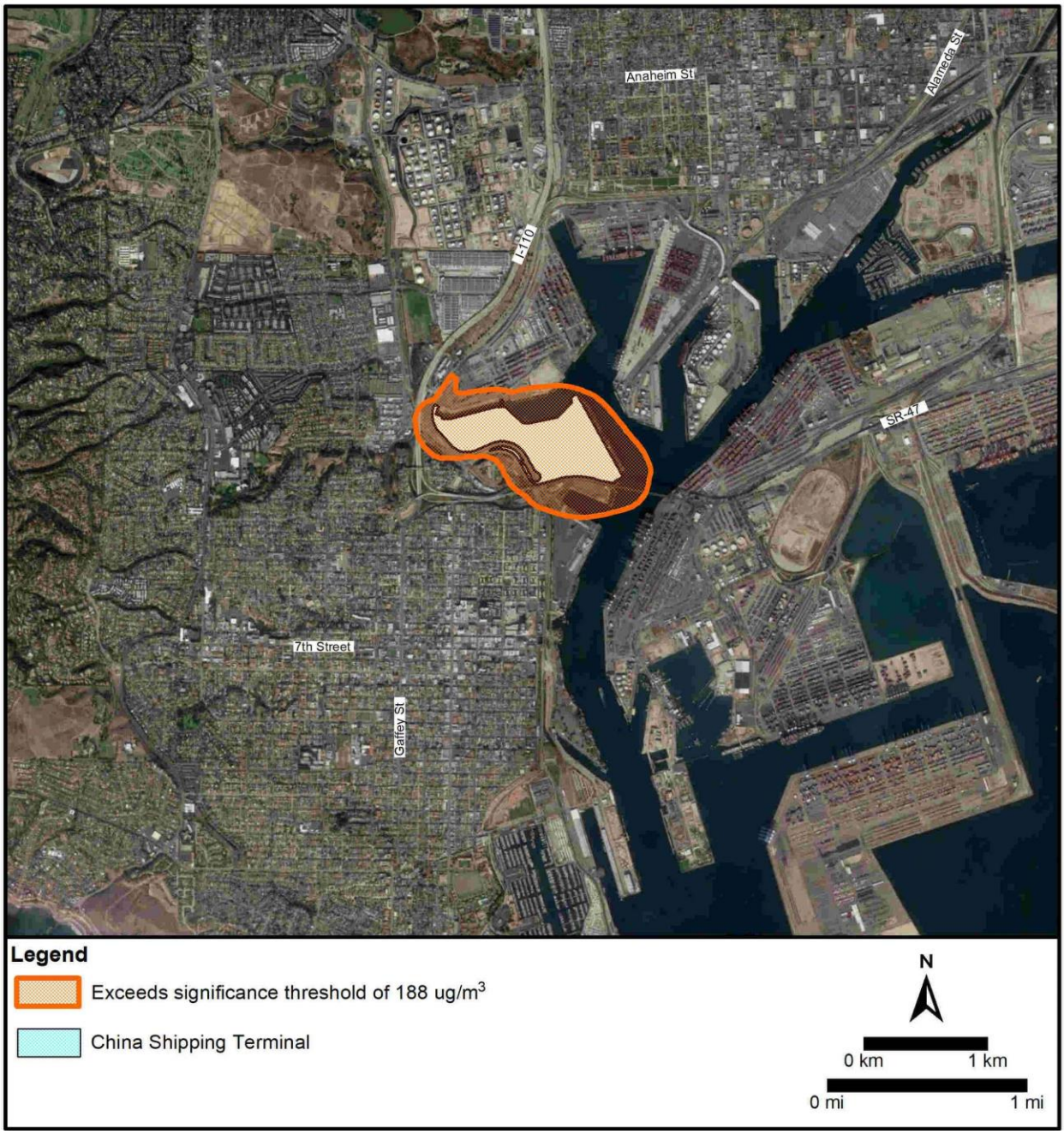


Figure B2-9. Area of Threshold Exceedance for the Revised Project; 2014 Federal 1-Hour NO_2 Concentrations

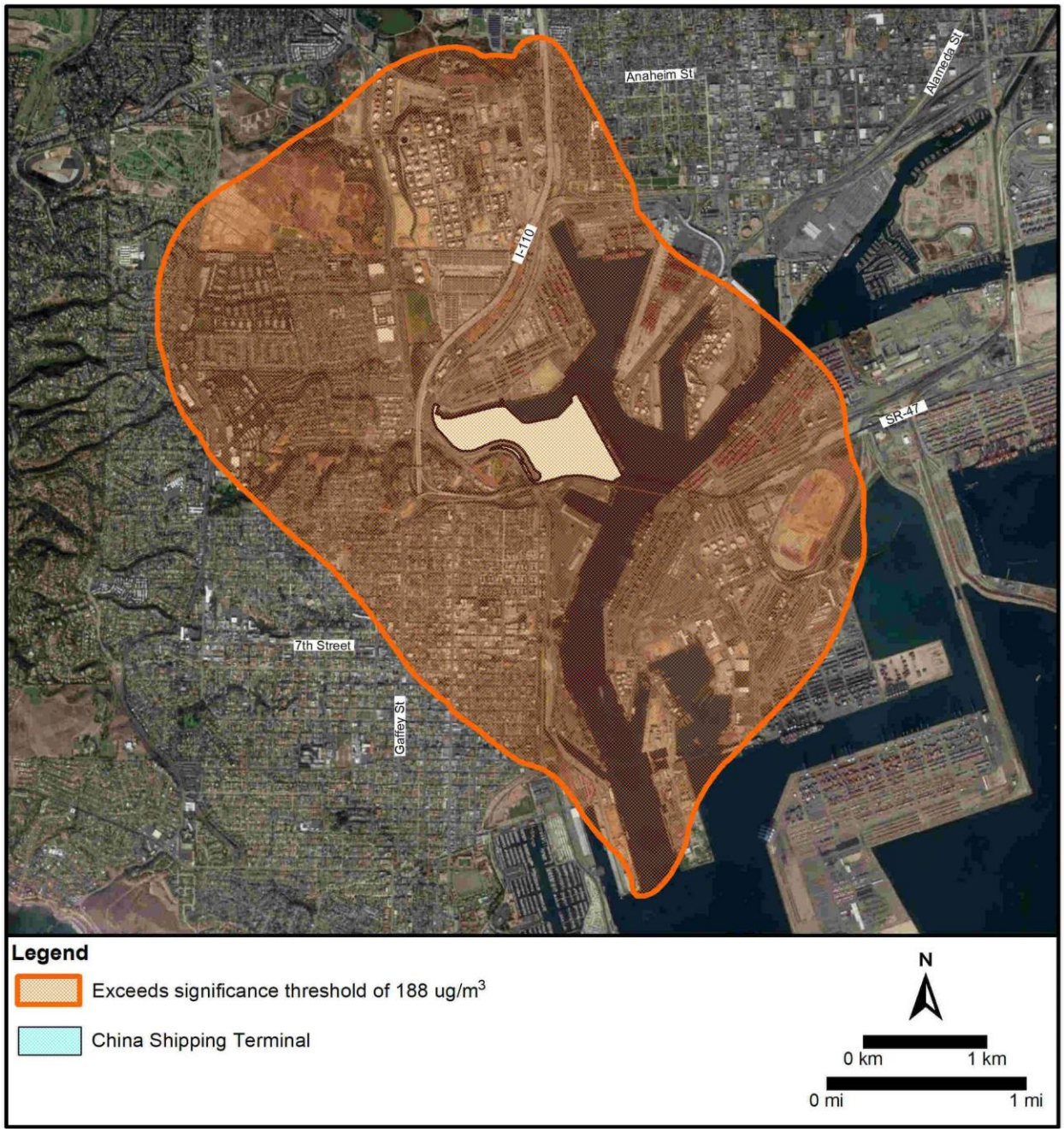


Figure B2-10. Area of Threshold Exceedance for the Revised Project; 2018 Federal 1-Hour NO_2 Concentrations

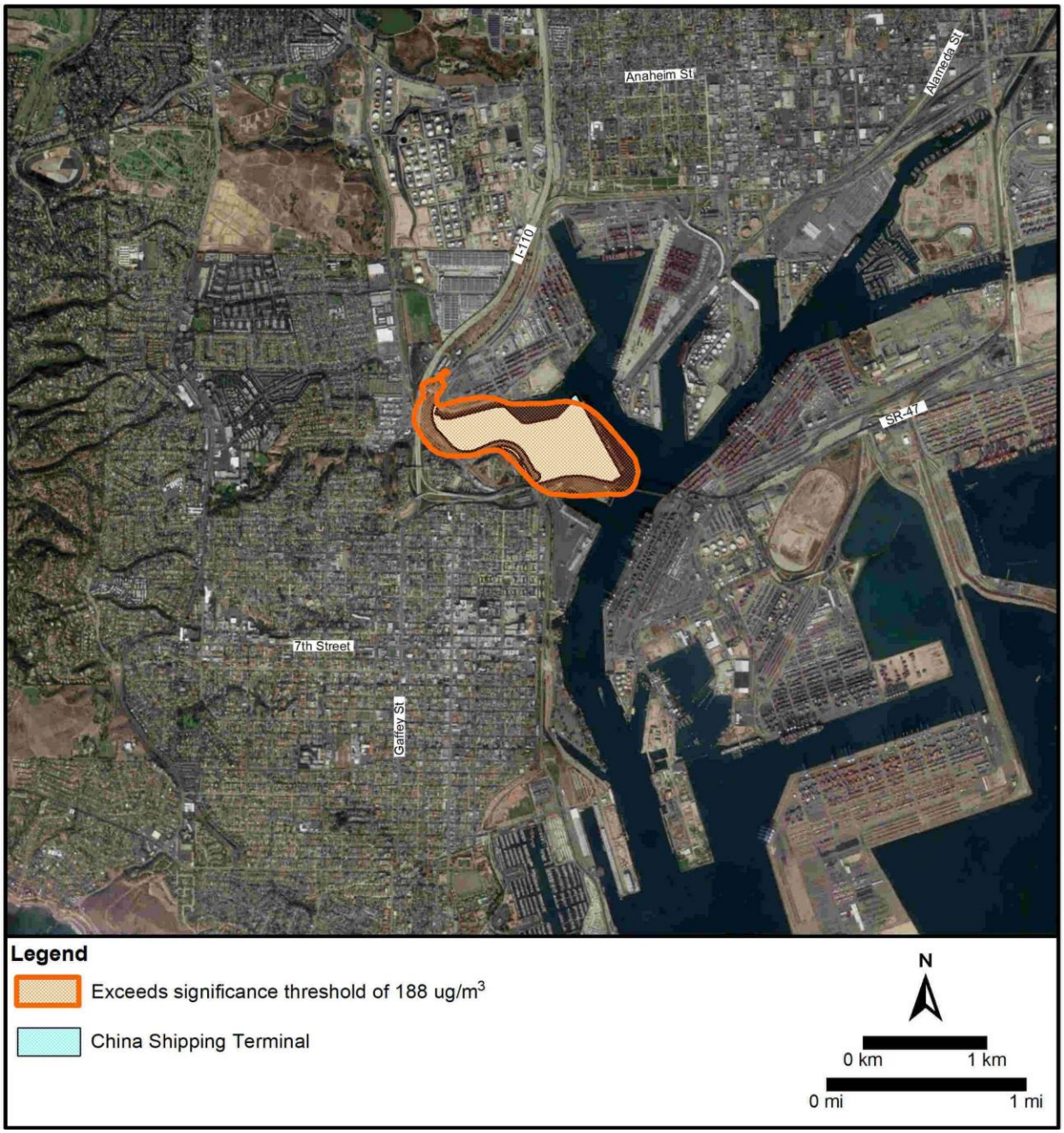


Figure B2-11. Area of Threshold Exceedance for the Revised Project; 2020 Federal 1-Hour NO_2 Concentrations

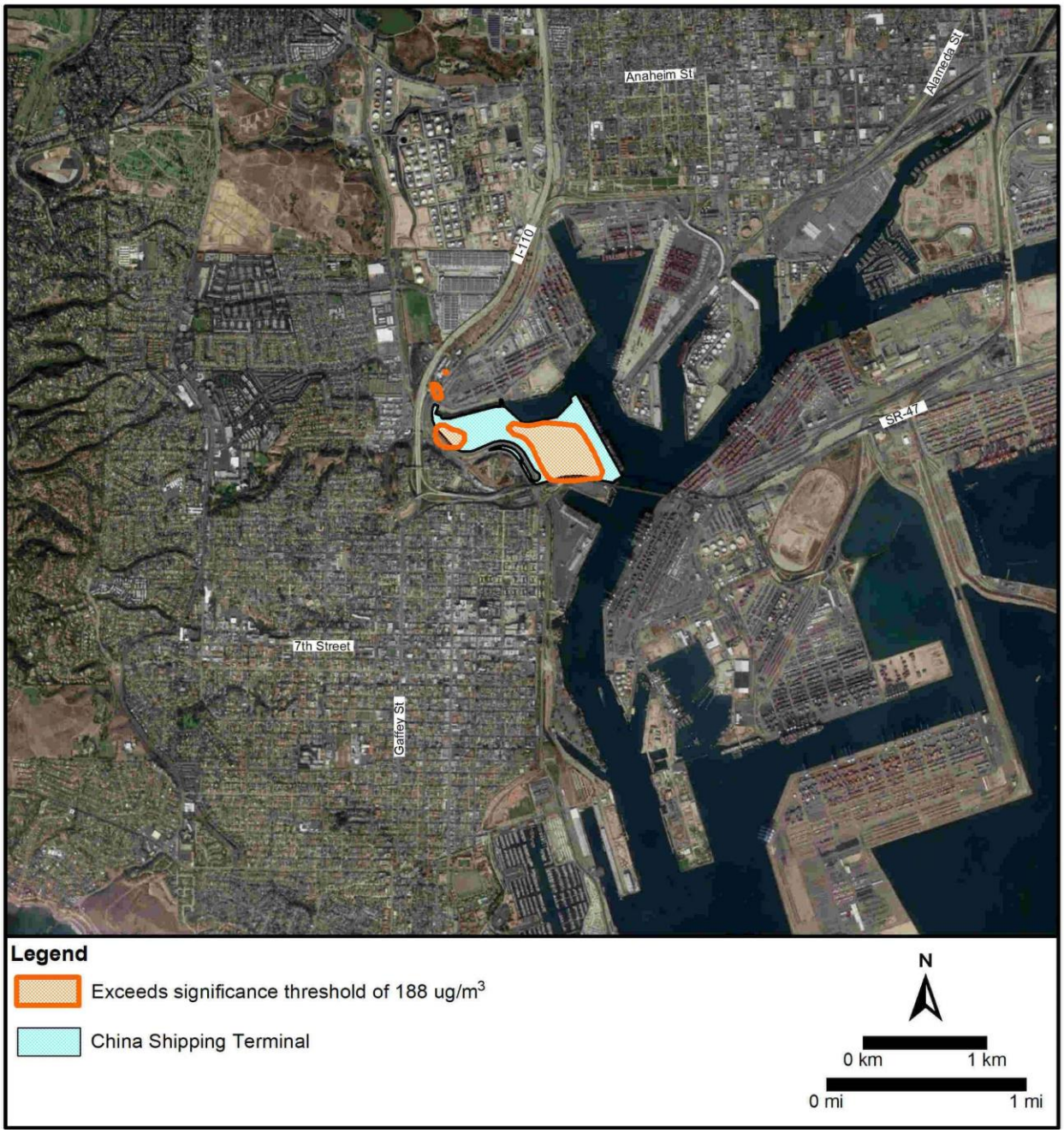


Figure B2-12. Area of Threshold Exceedance for the Revised Project; 2021 Federal 1-Hour NO_2 Concentrations

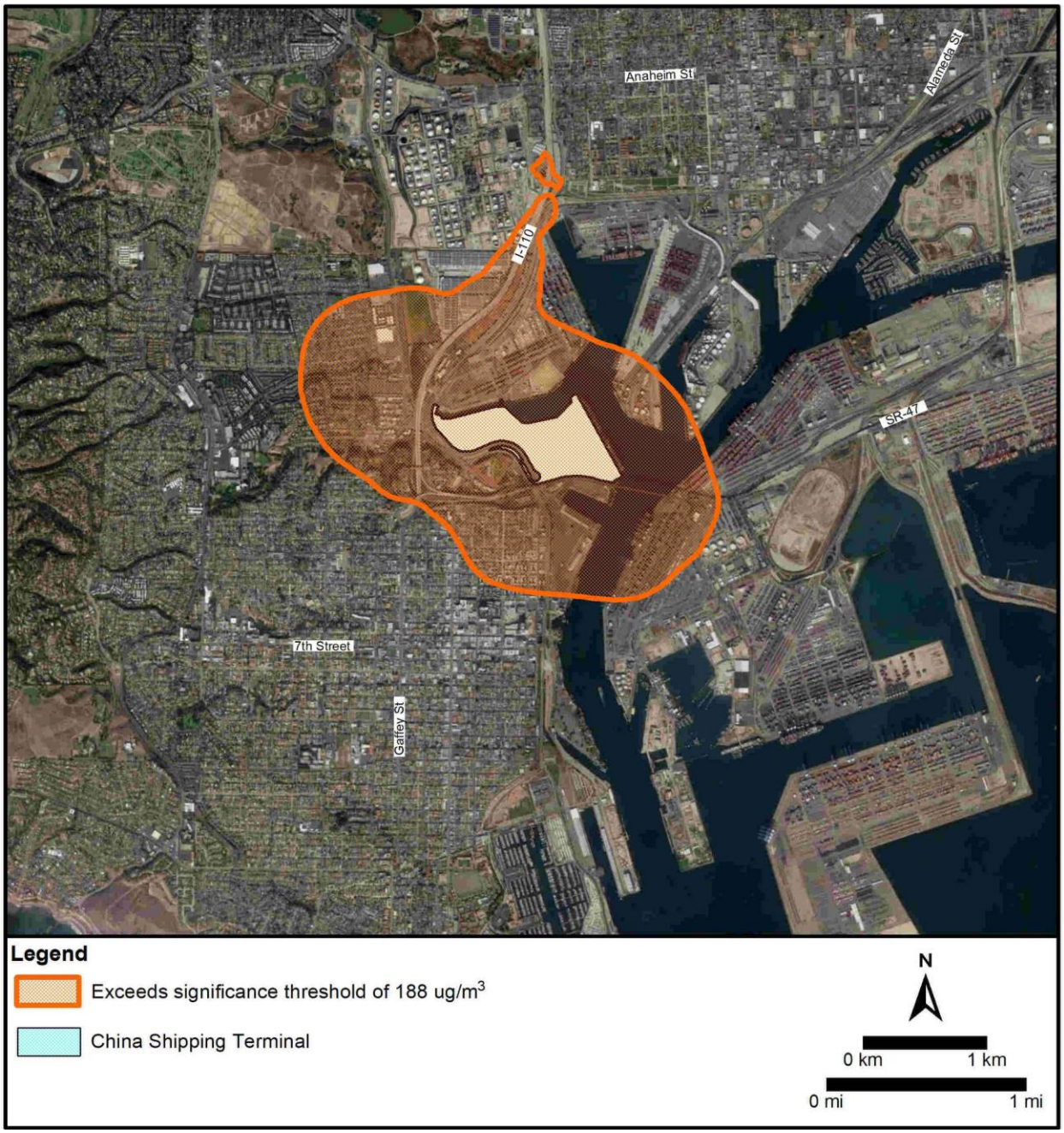


Figure B2-13. Area of Threshold Exceedance for the Revised Project; 2022 Federal 1-Hour NO_2 Concentrations

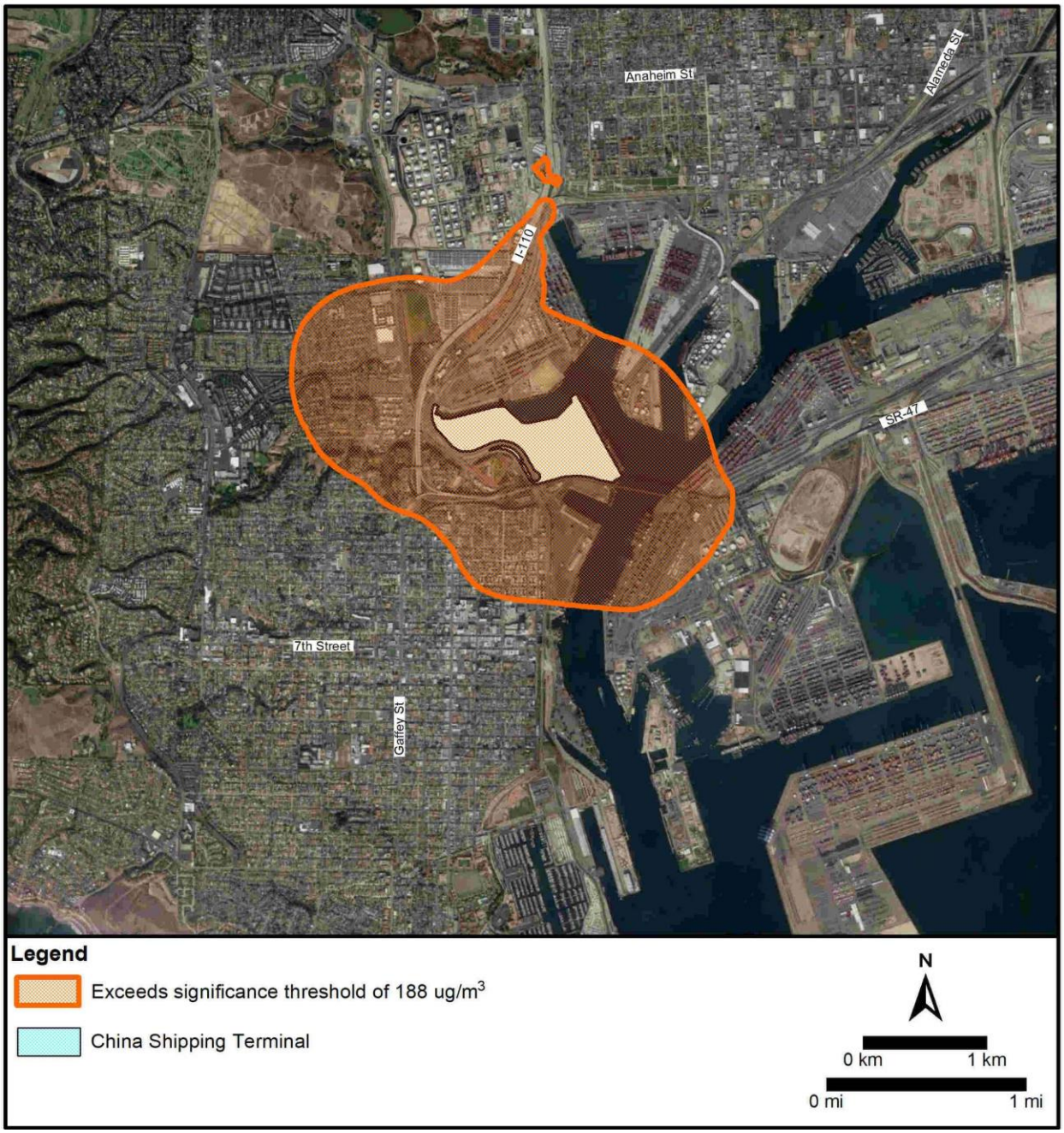


Figure B2-14. Area of Threshold Exceedance for the Revised Project; 2023 Federal 1-Hour NO_2 Concentrations

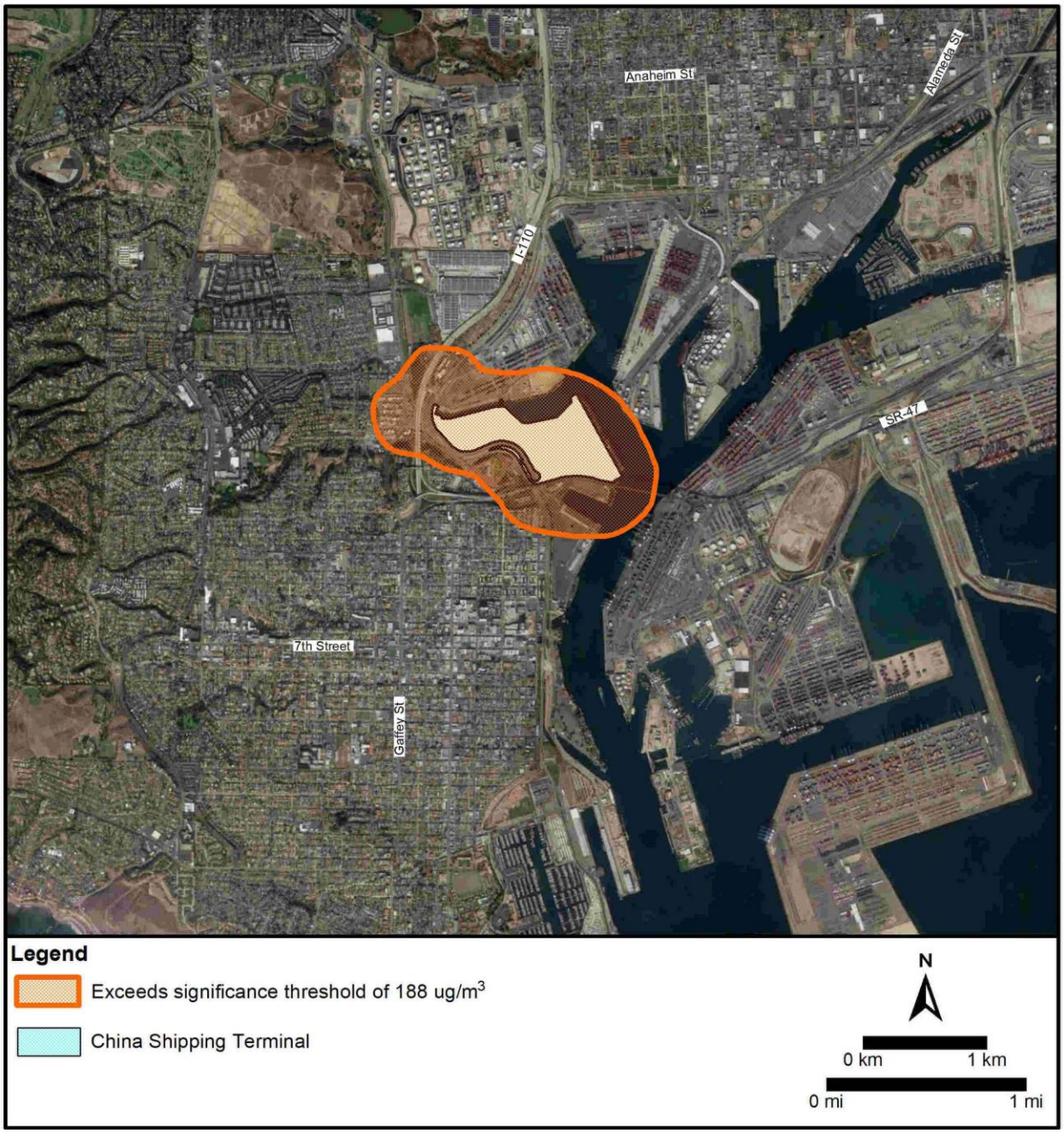


Figure B2-15. Area of Threshold Exceedance for the Revised Project; 2026 Federal 1-Hour NO_2 Concentrations

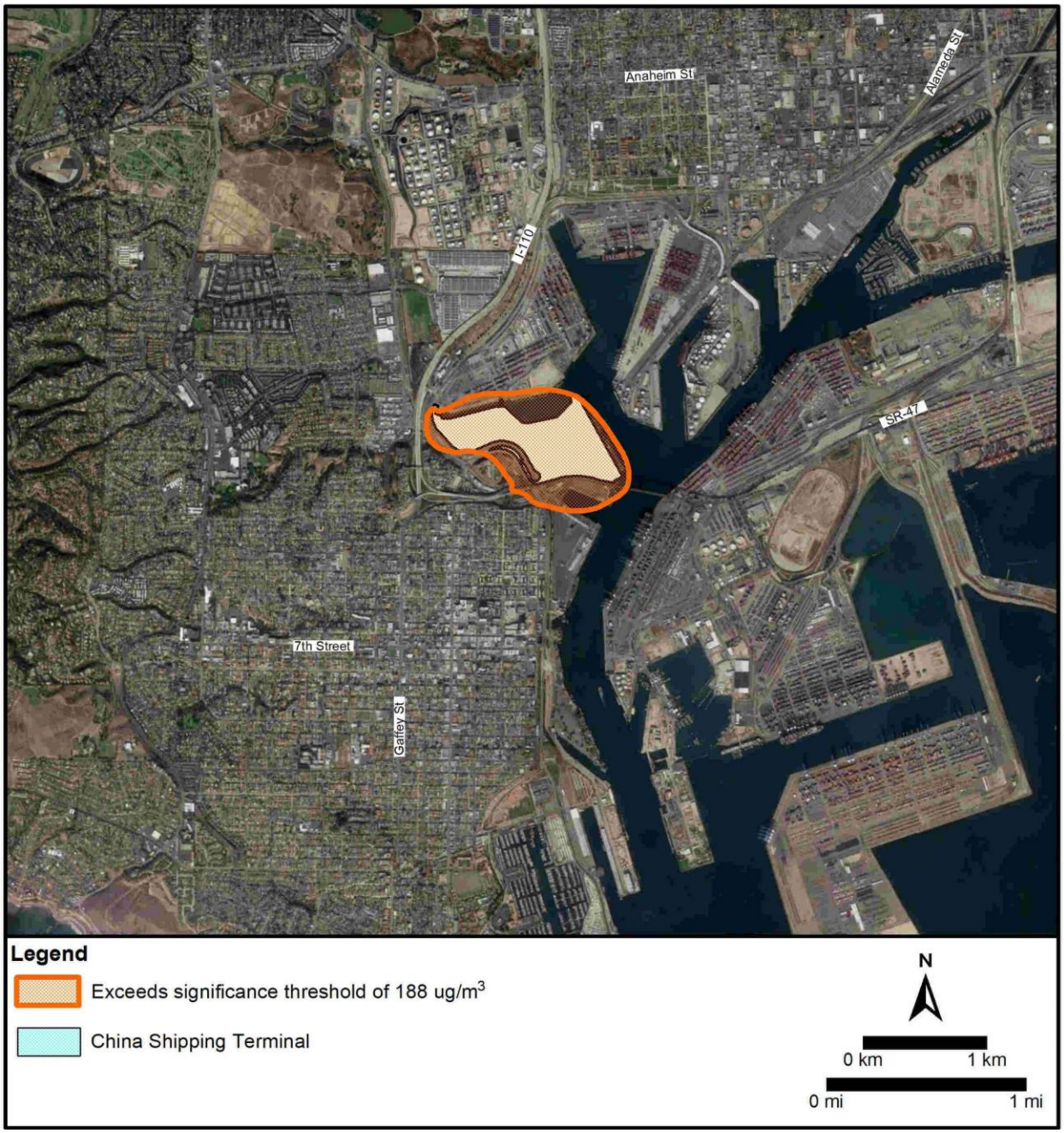


Figure B2-16. Area of Threshold Exceedance for the Revised Project; 2014 State 1-Hour NO_2 Concentrations

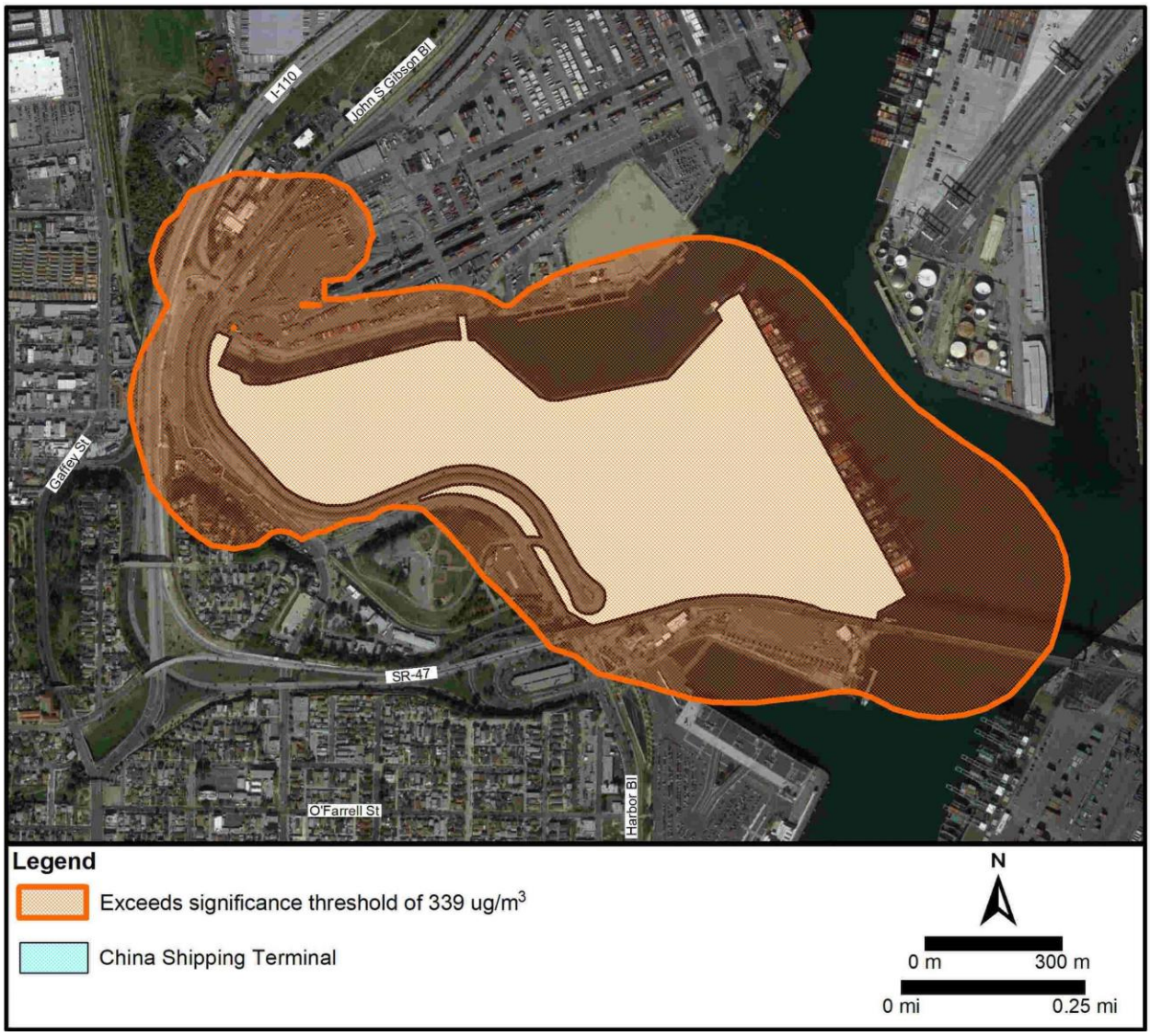


Figure B2-17. Area of Threshold Exceedance for the Revised Project; 2021 State 1-Hour NO_2 Concentrations

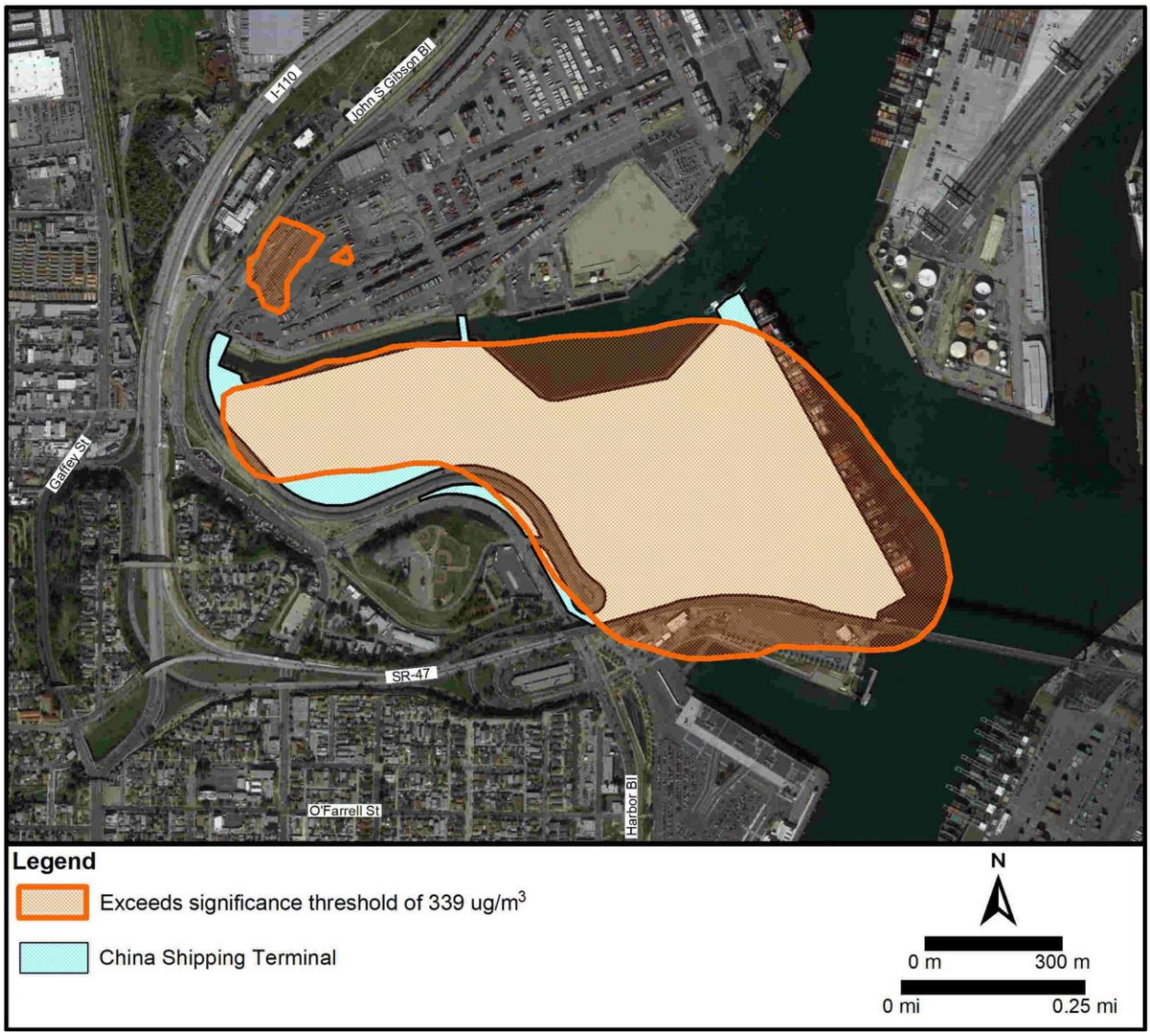


Figure B2-18. Area of Threshold Exceedance for the Revised Project; 2022 State 1-Hour NO_2 Concentrations

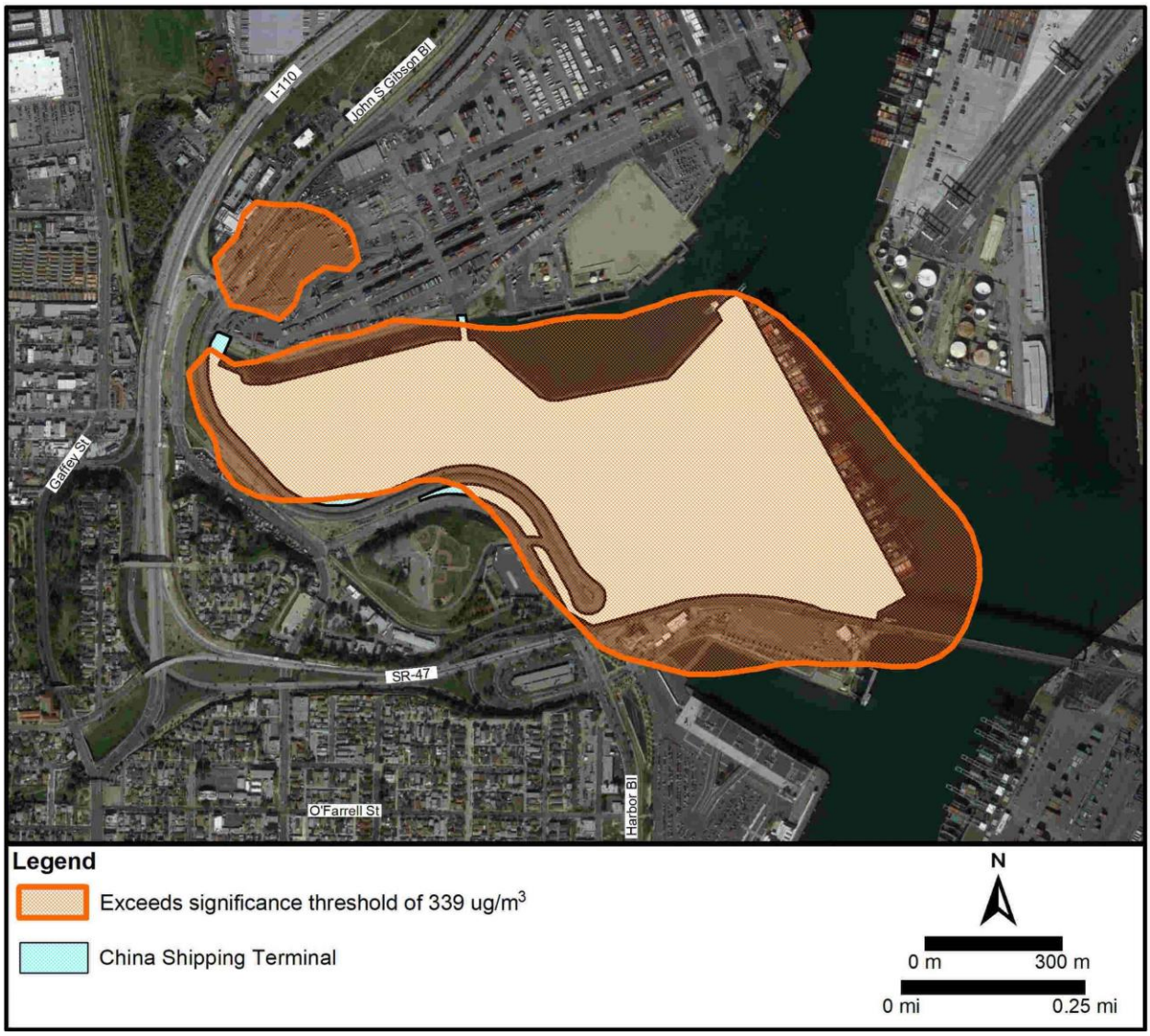


Figure B2-19. Area of Threshold Exceedance for the Revised Project; 2023 State 1-Hour NO_2 Concentrations

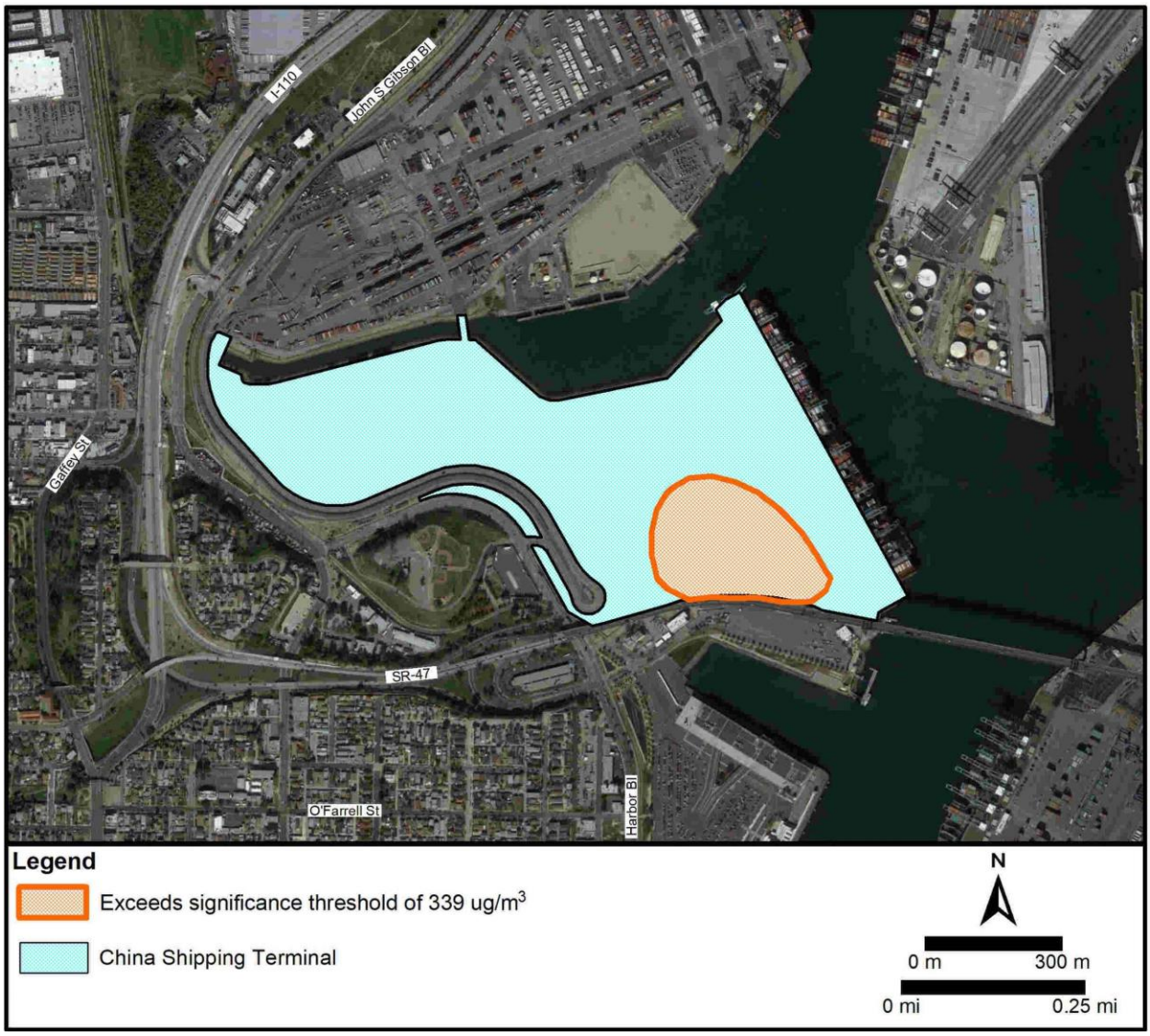


Figure B2-20. Area of Threshold Exceedance for the Revised Project; 2014 Annual NO_2 Concentrations

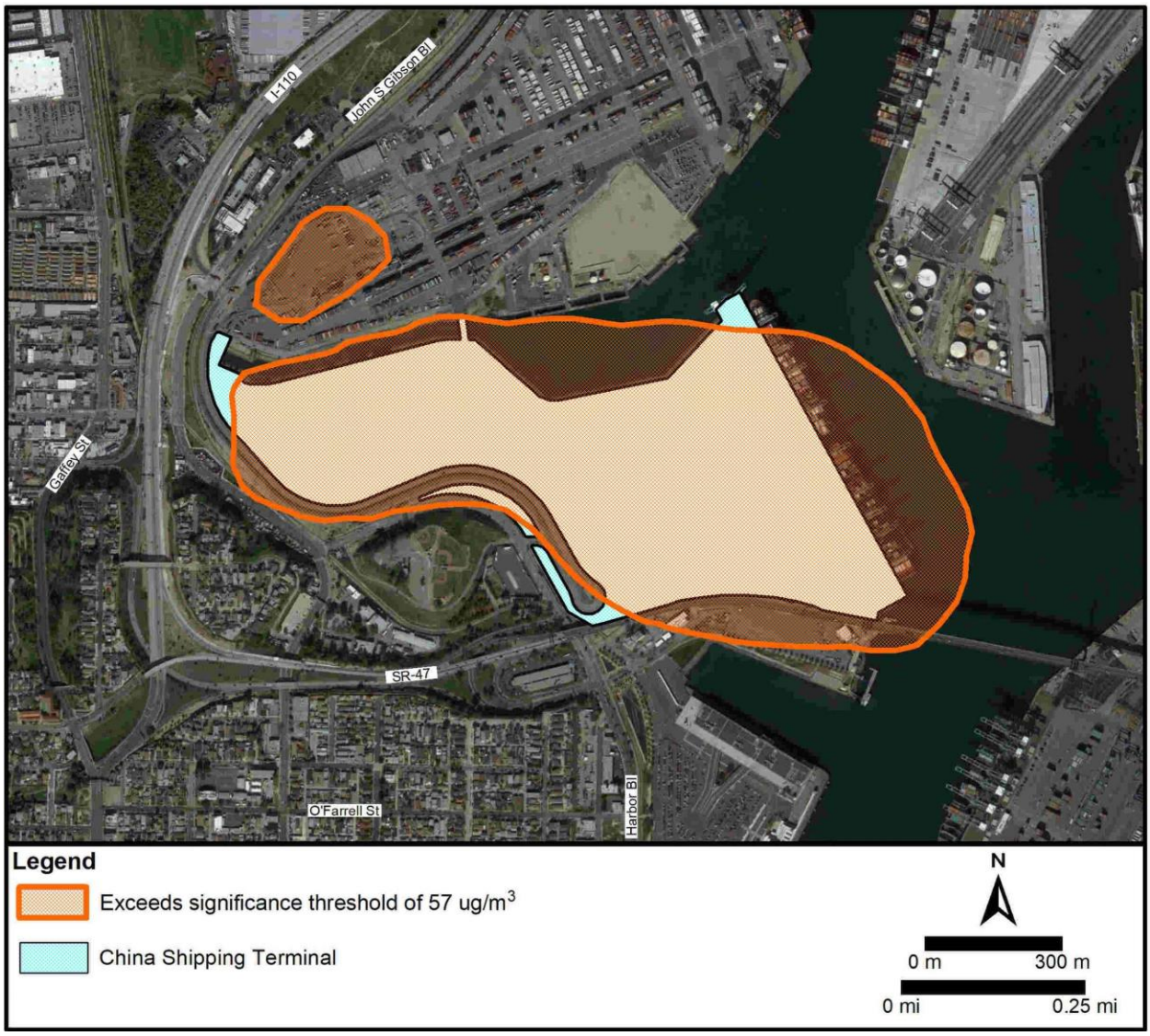


Figure B2-21. Area of Threshold Exceedance for the Revised Project; 2021 Annual NO_2 Concentrations

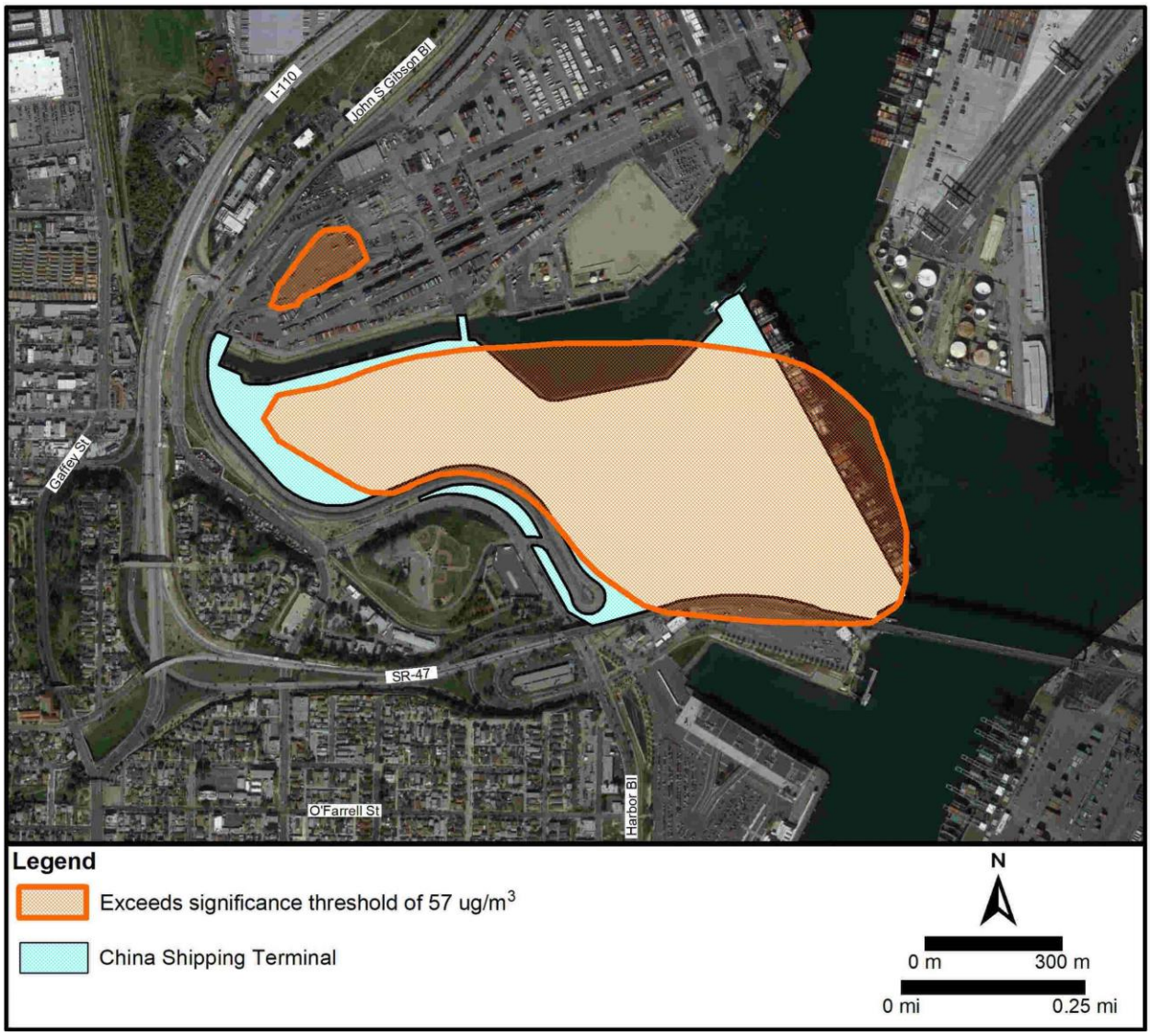


Figure B2-22. Area of Threshold Exceedance for the Revised Project; 2022 Annual NO_2 Concentrations

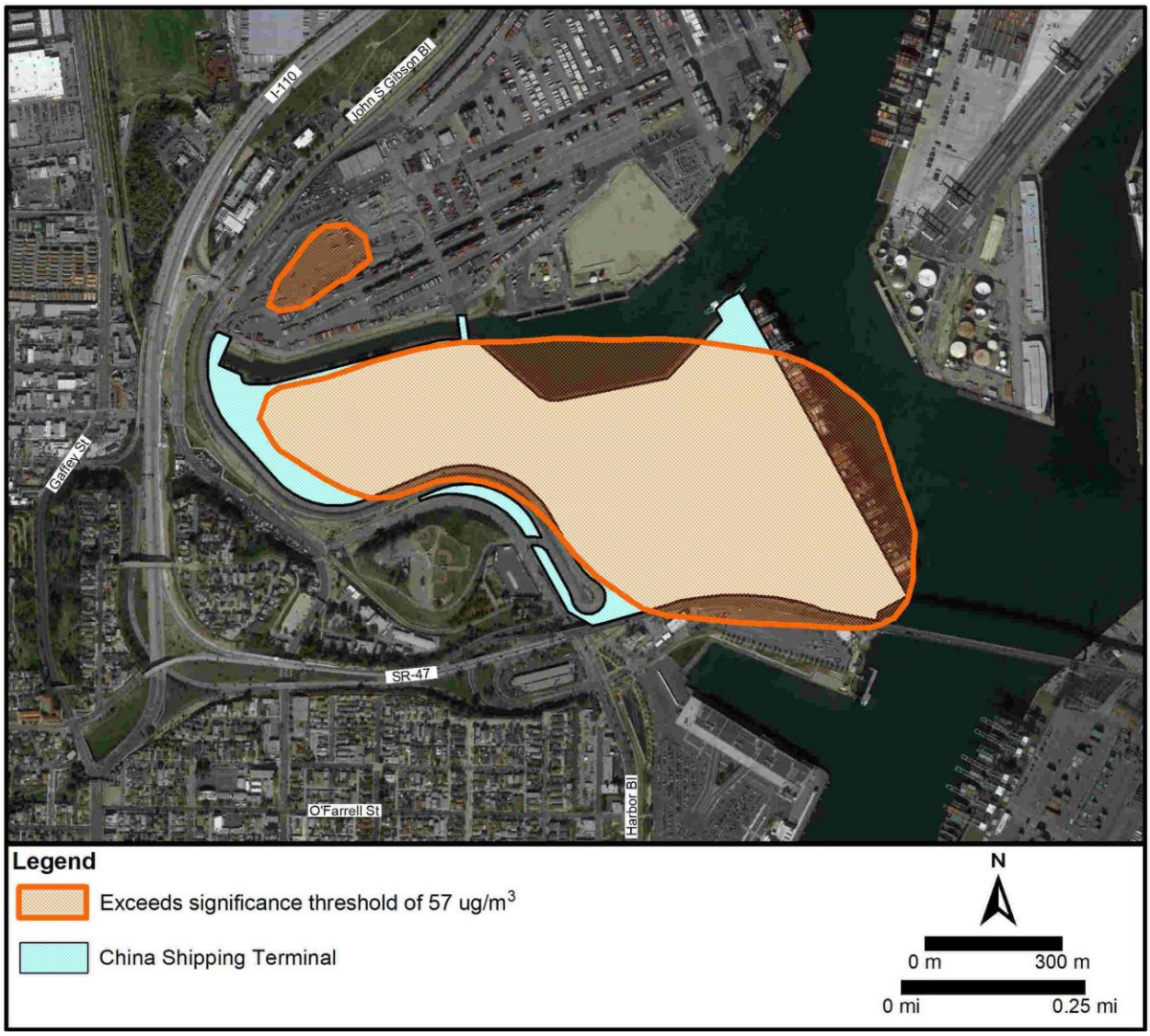


Figure B2-23. Area of Threshold Exceedance for the Revised Project; 2023 Annual NO_2 Concentrations

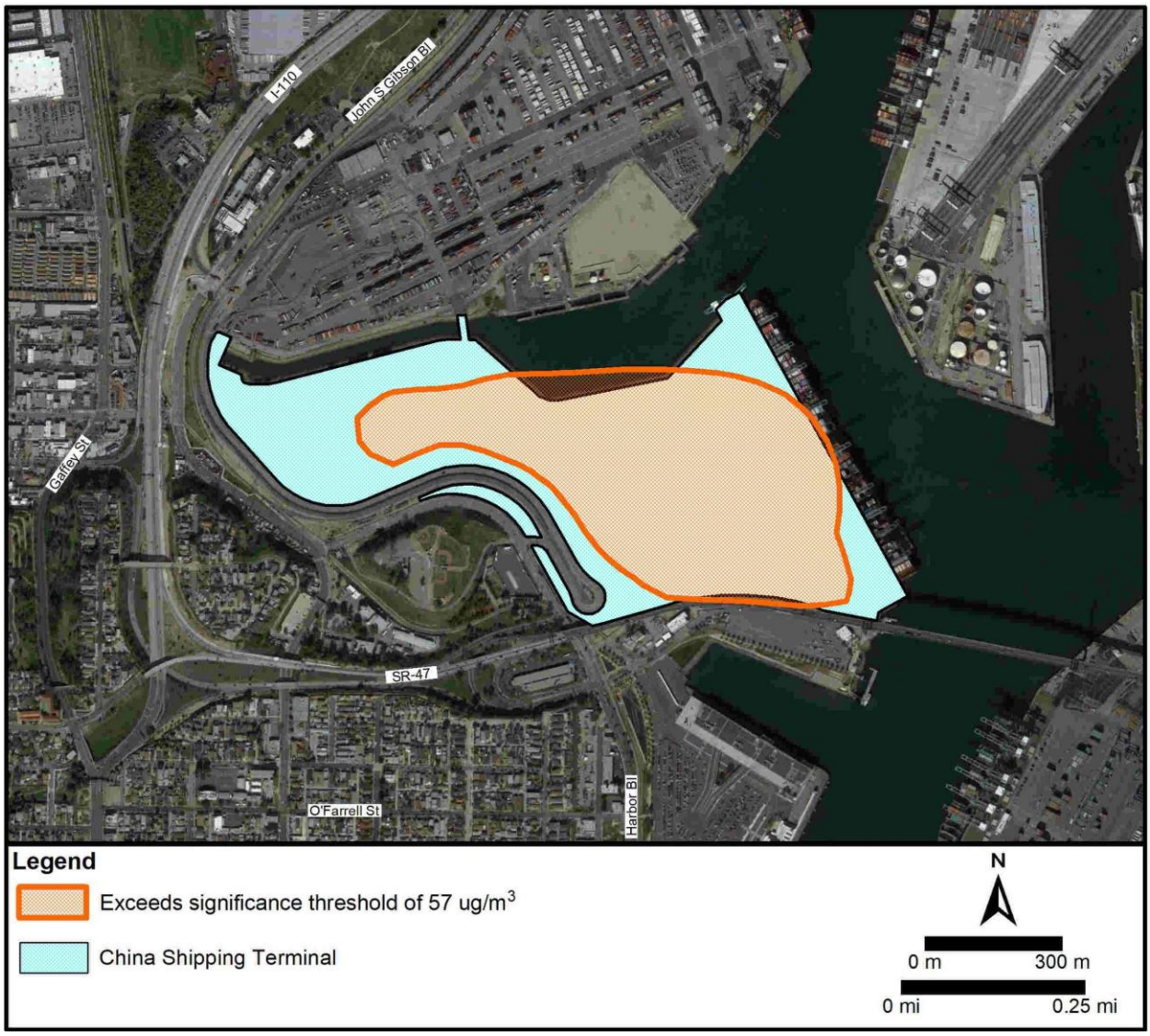


Figure B2-24. Area of Threshold Exceedance for the Revised Project; 2012 24-Hour PM_{10} Concentration Increments

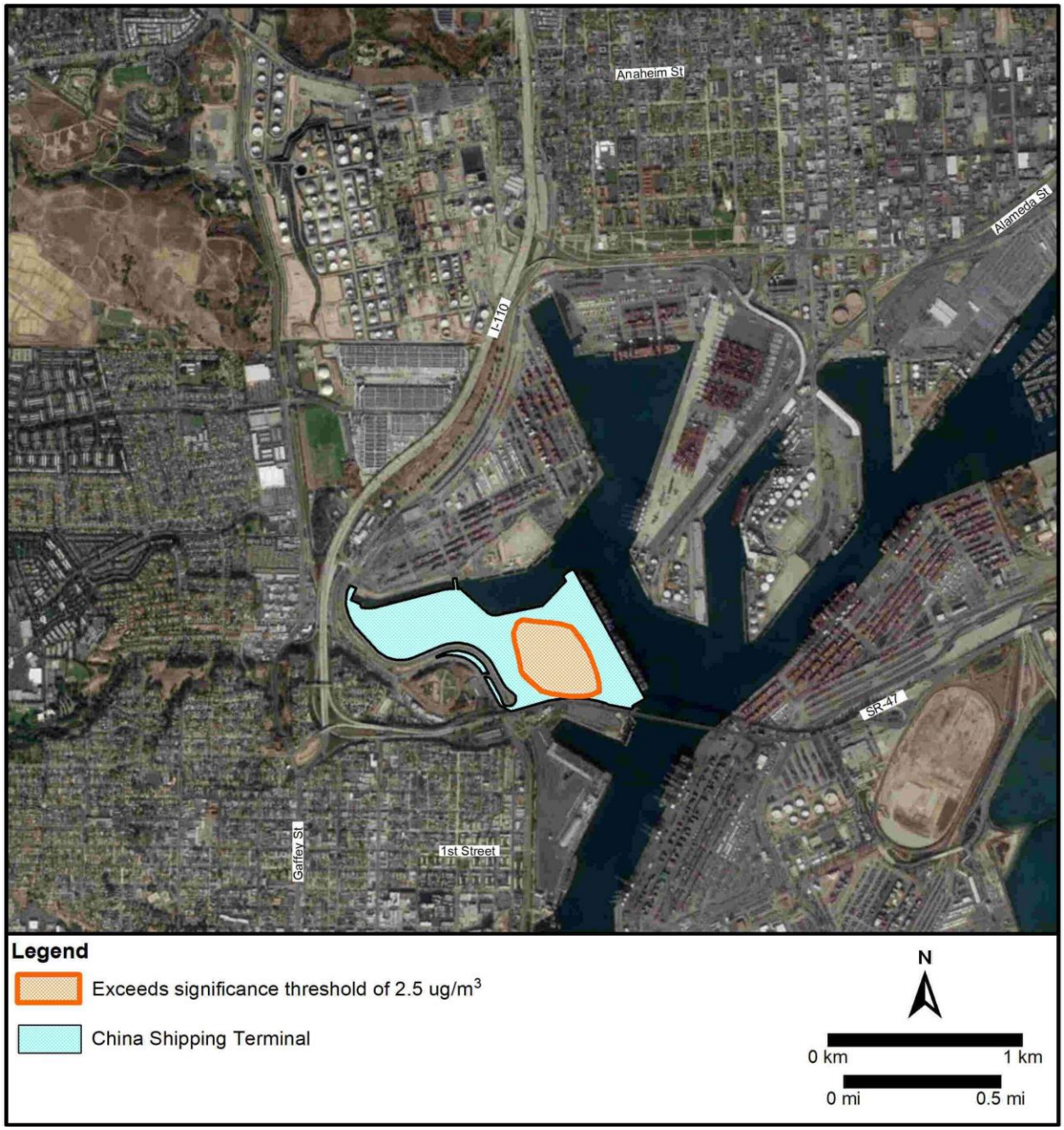


Figure B2-25. Area of Threshold Exceedance for the Revised Project; 2014 24-Hour PM_{10} Concentration Increments

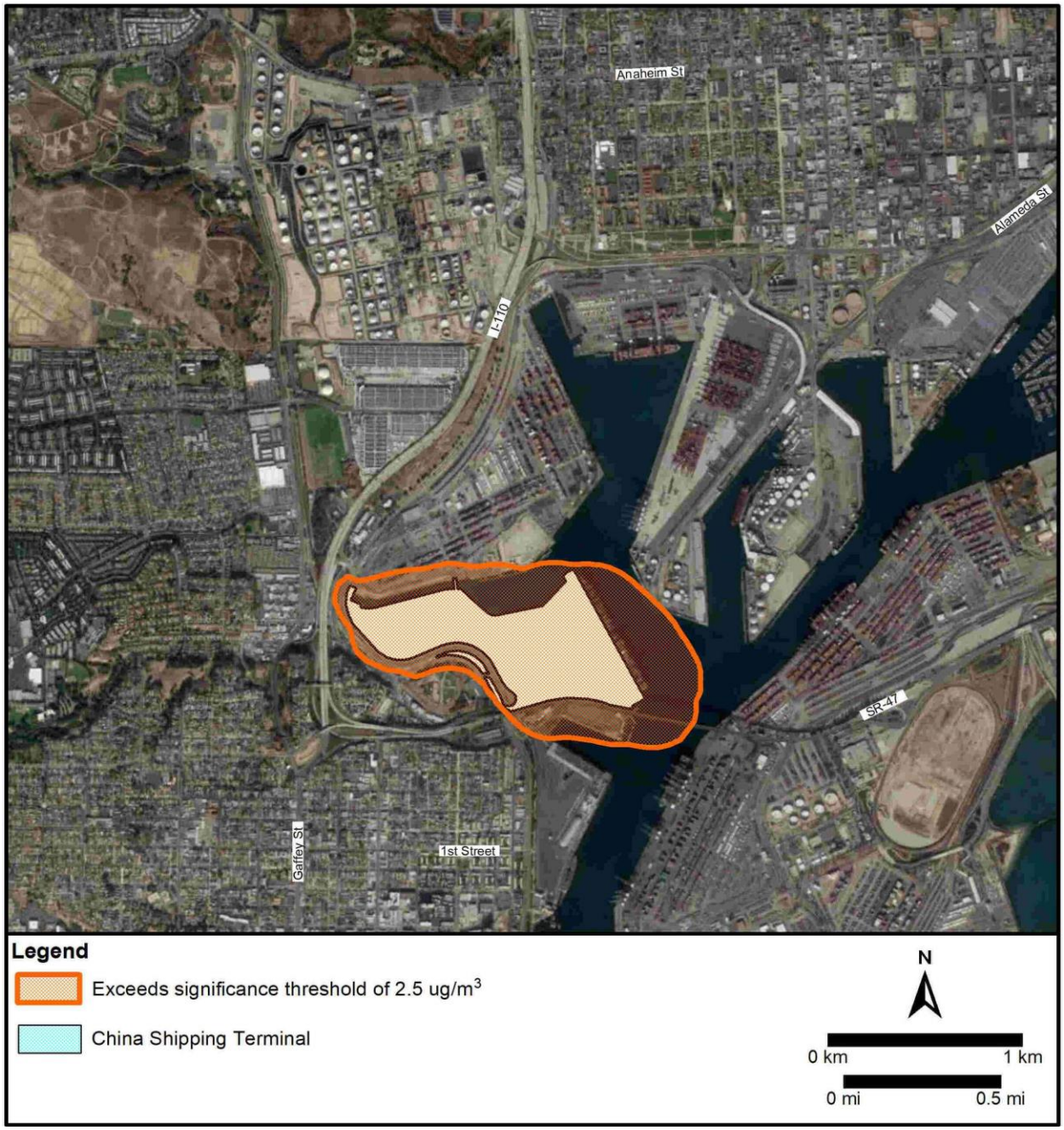


Figure B2-26. Area of Threshold Exceedance for the Revised Project; 2020 24-Hour PM_{10} Concentration Increments

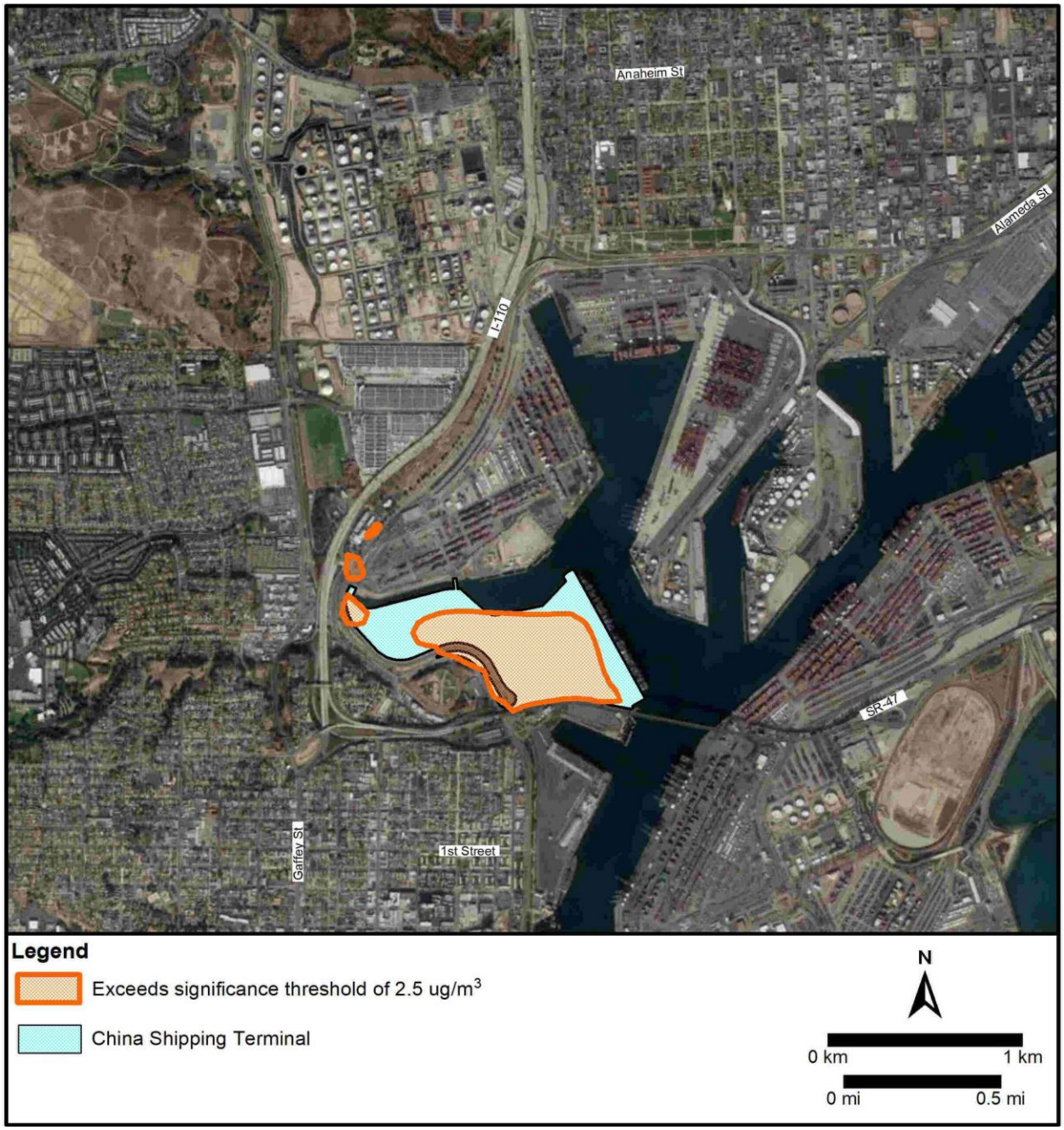


Figure B2-27. Area of Threshold Exceedance for the Revised Project; 2021 24-Hour PM_{10} Concentration Increments

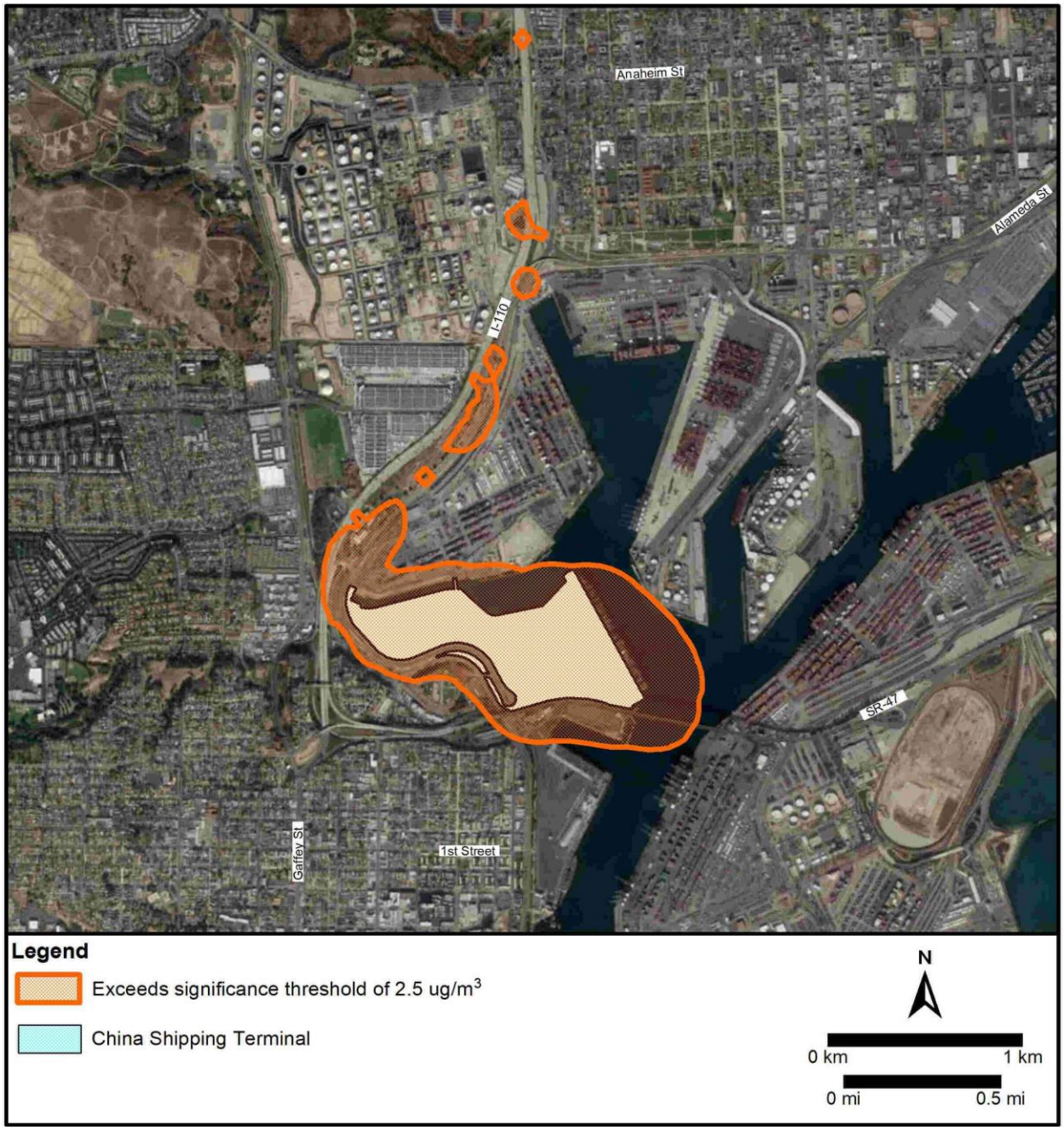


Figure B2-28. Area of Threshold Exceedance for the Revised Project; 2022 24-Hour PM_{10} Concentration Increments

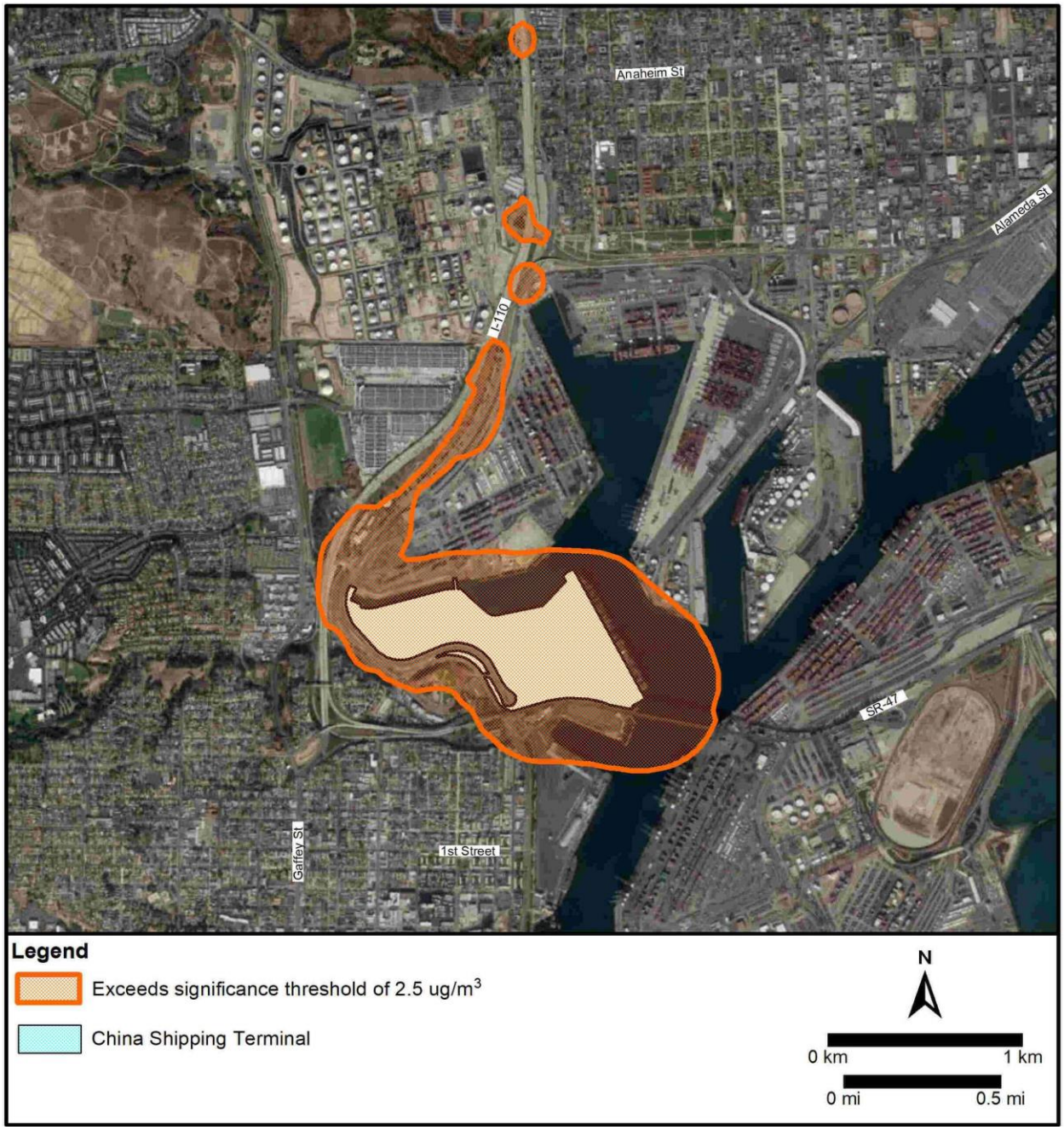


Figure B2-29. Area of Threshold Exceedance for the Revised Project; 2023 24-Hour PM_{10} Concentration Increments

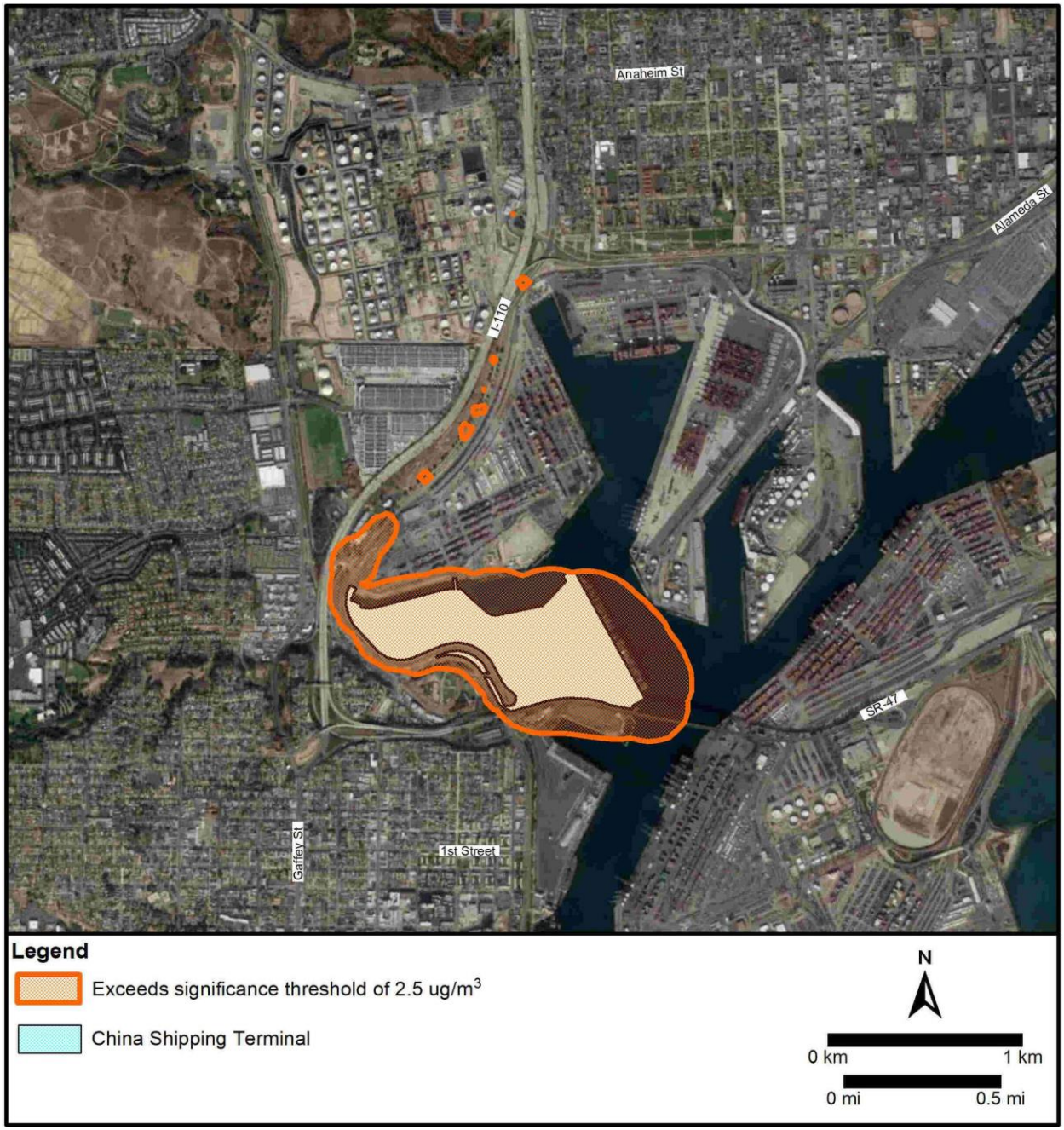


Figure B2-30. Area of Threshold Exceedance for the Revised Project; 2026 24-Hour PM_{10} Concentration Increments

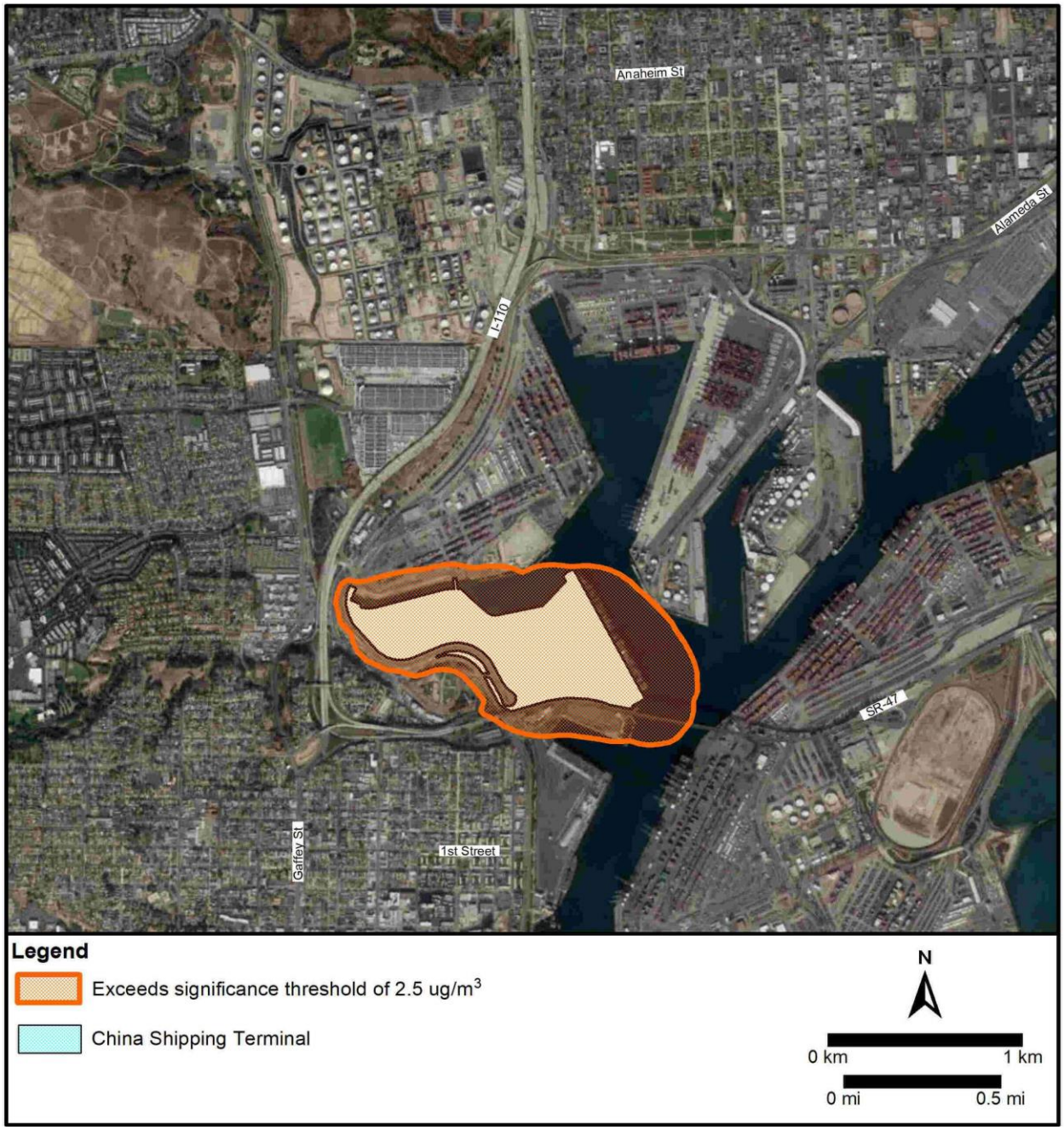


Figure B2-31. Area of Threshold Exceedance for the Revised Project; 2036 24-Hour PM_{10} Concentration Increments

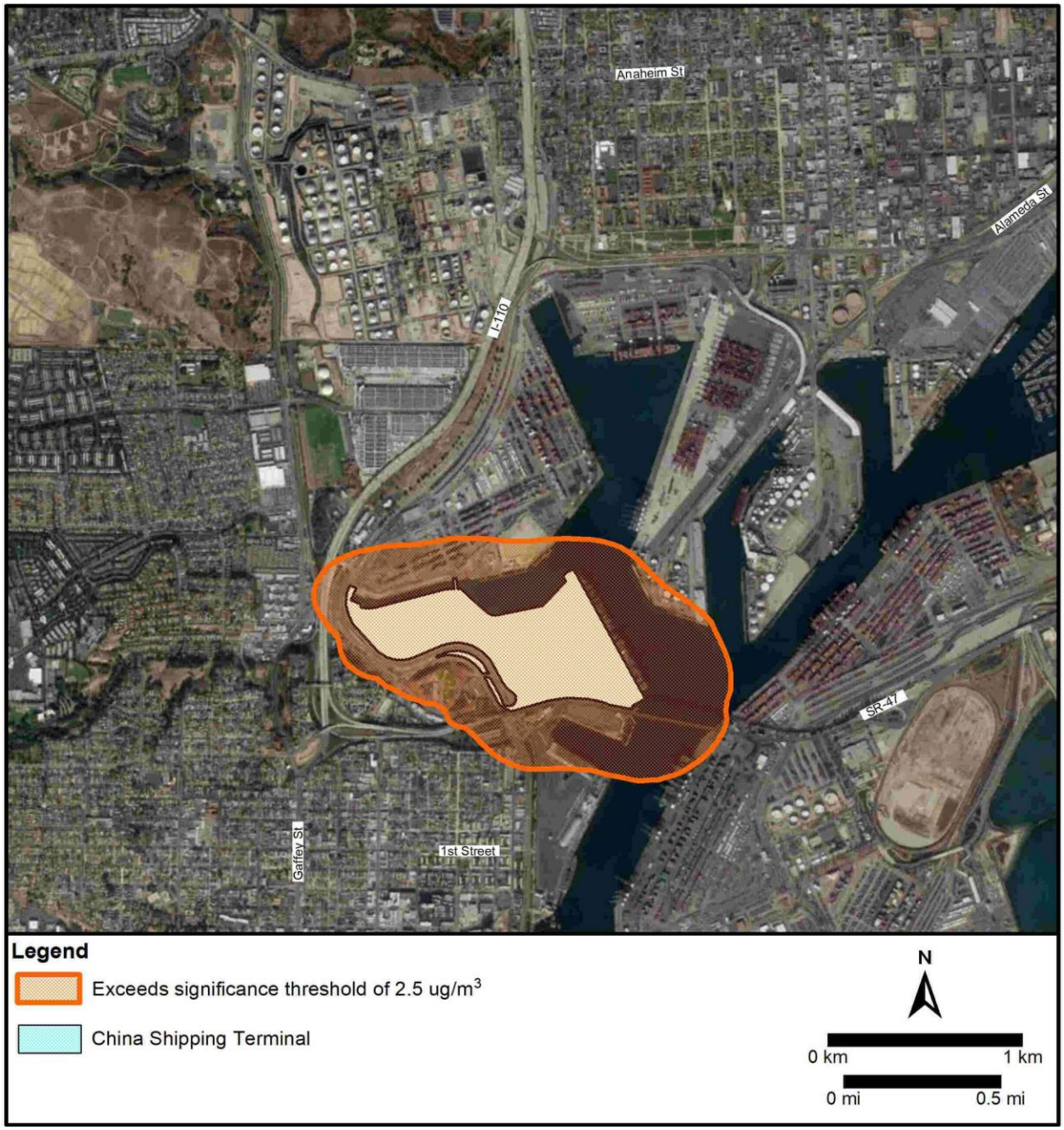


Figure B2-32. Area of Threshold Exceedance for the Revised Project; 2045 24-Hour PM_{10} Concentration Increments

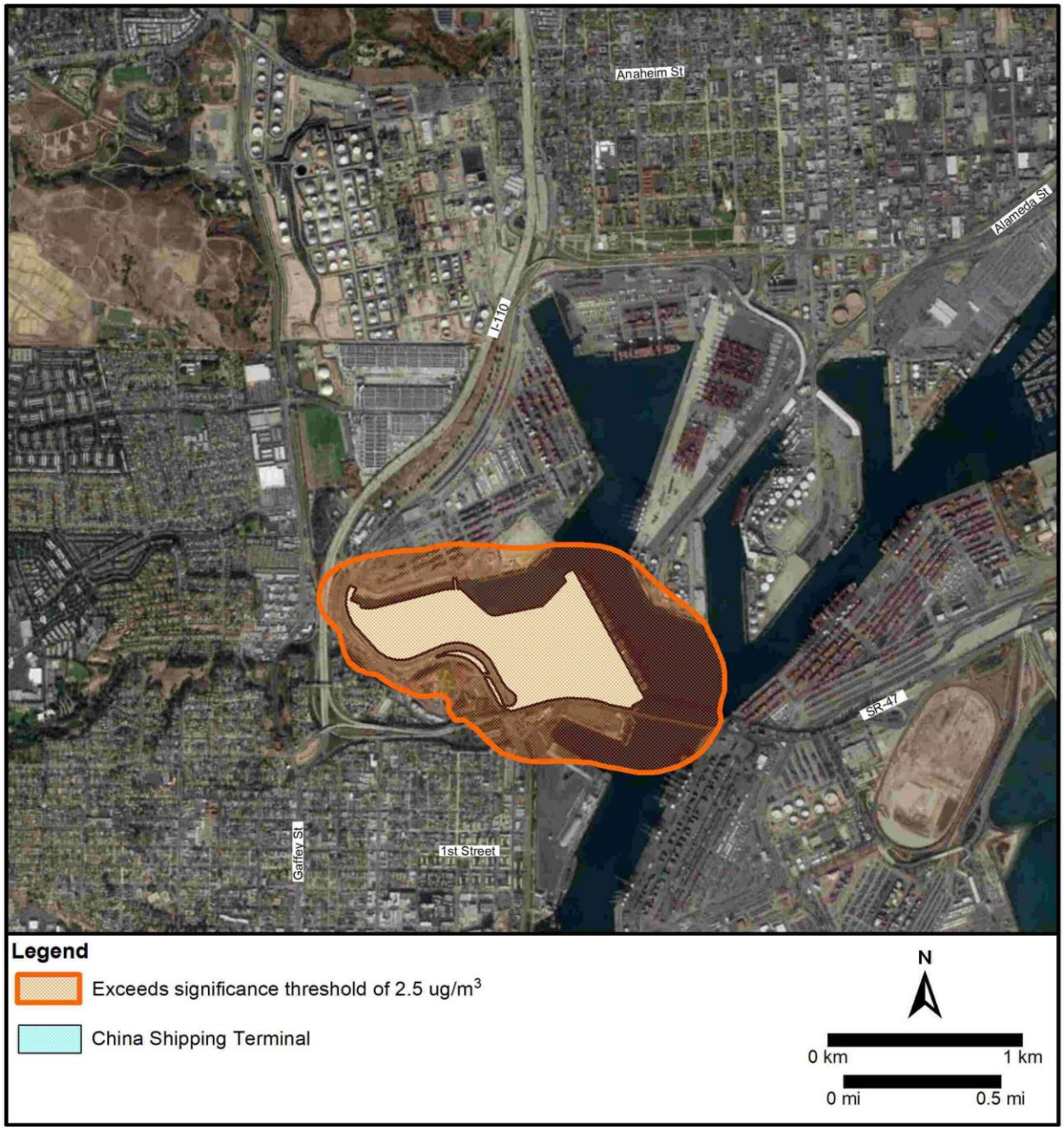


Figure B2-33. Area of Threshold Exceedance for the Revised Project; 2014 Annual PM_{10} Concentration Increments

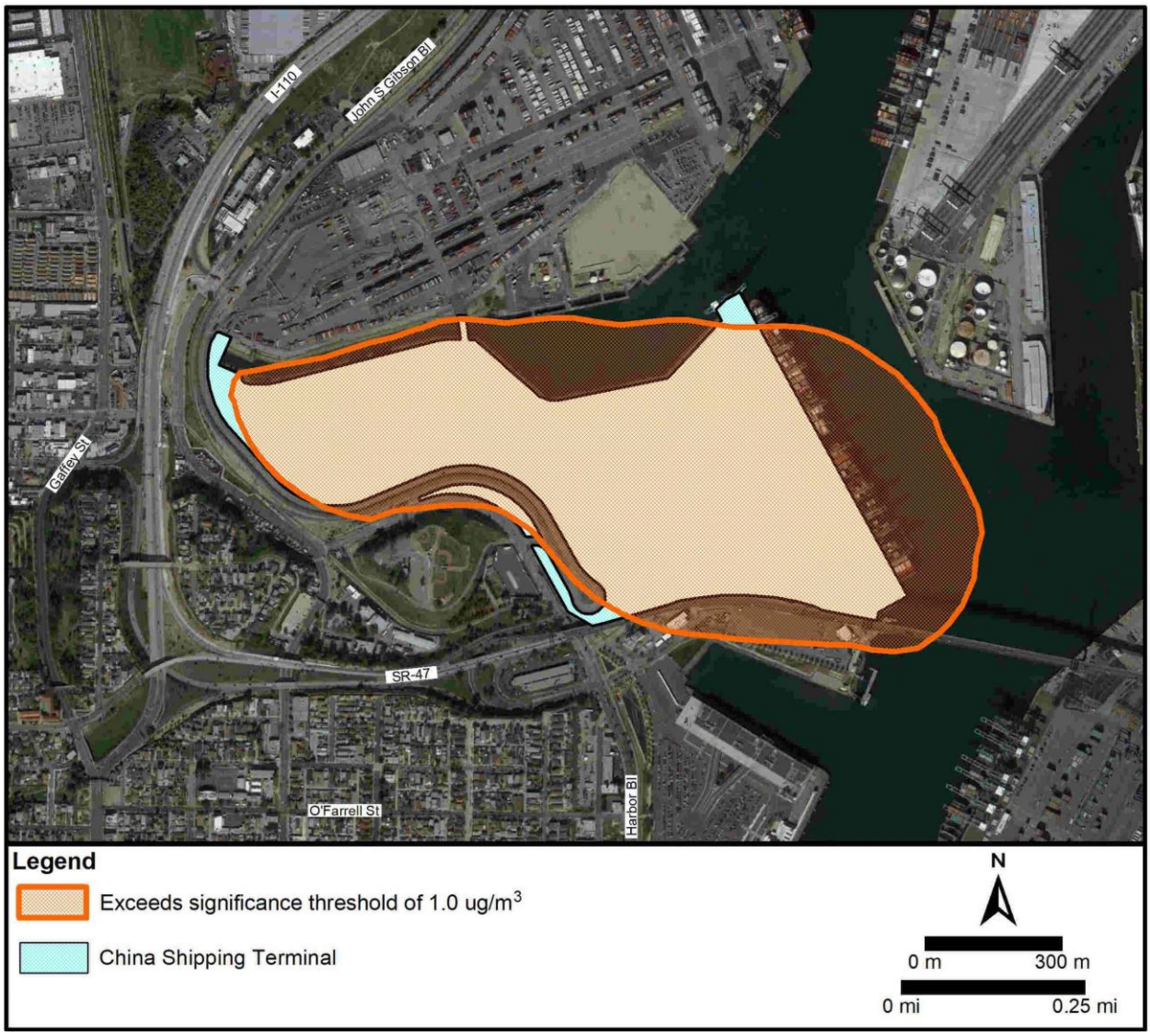


Figure B2-34. Area of Threshold Exceedance for the Revised Project; 2020 Annual PM_{10} Concentration Increments

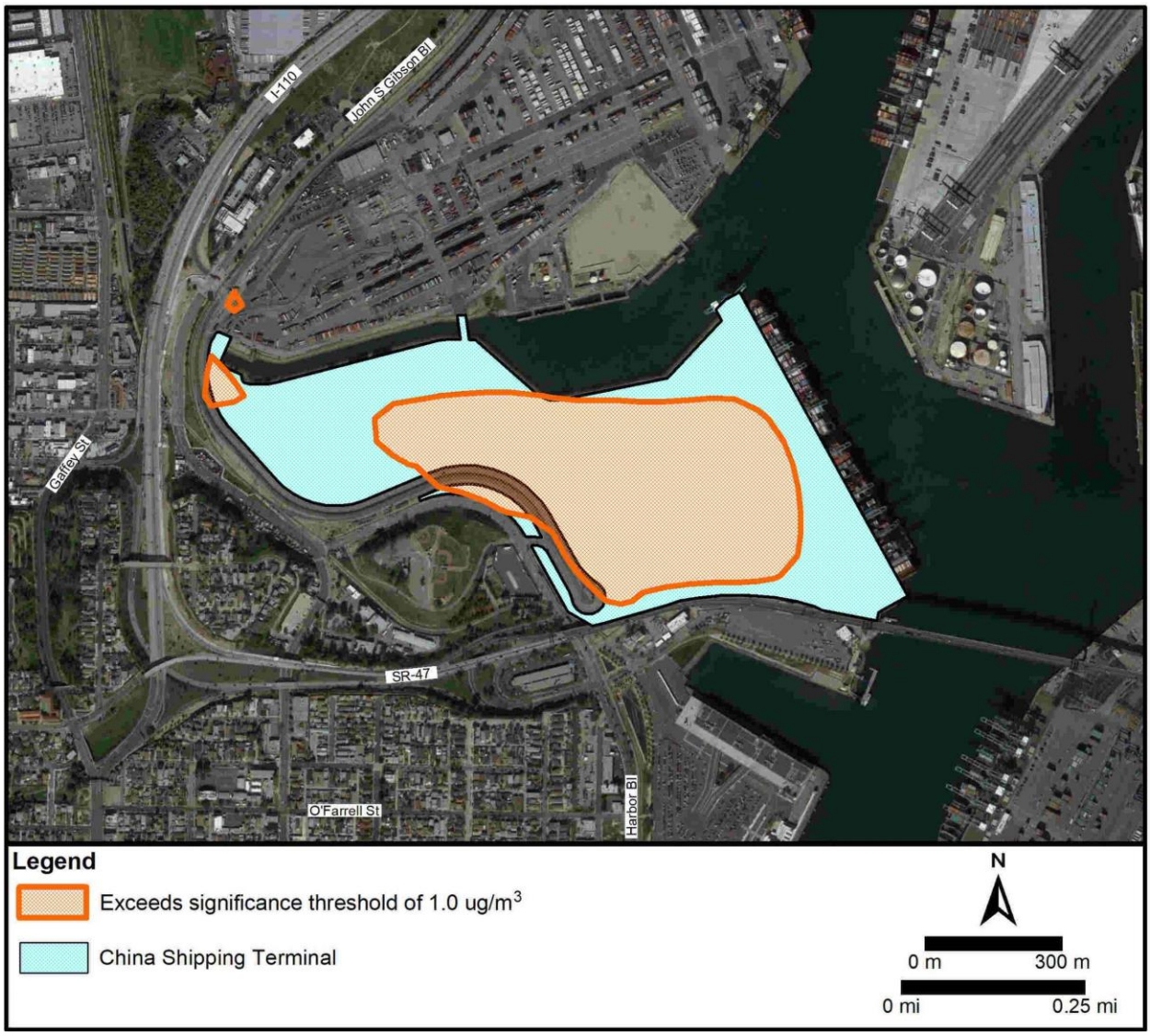


Figure B2-35. Area of Threshold Exceedance for the Revised Project; 2021 Annual PM_{10} Concentration Increments

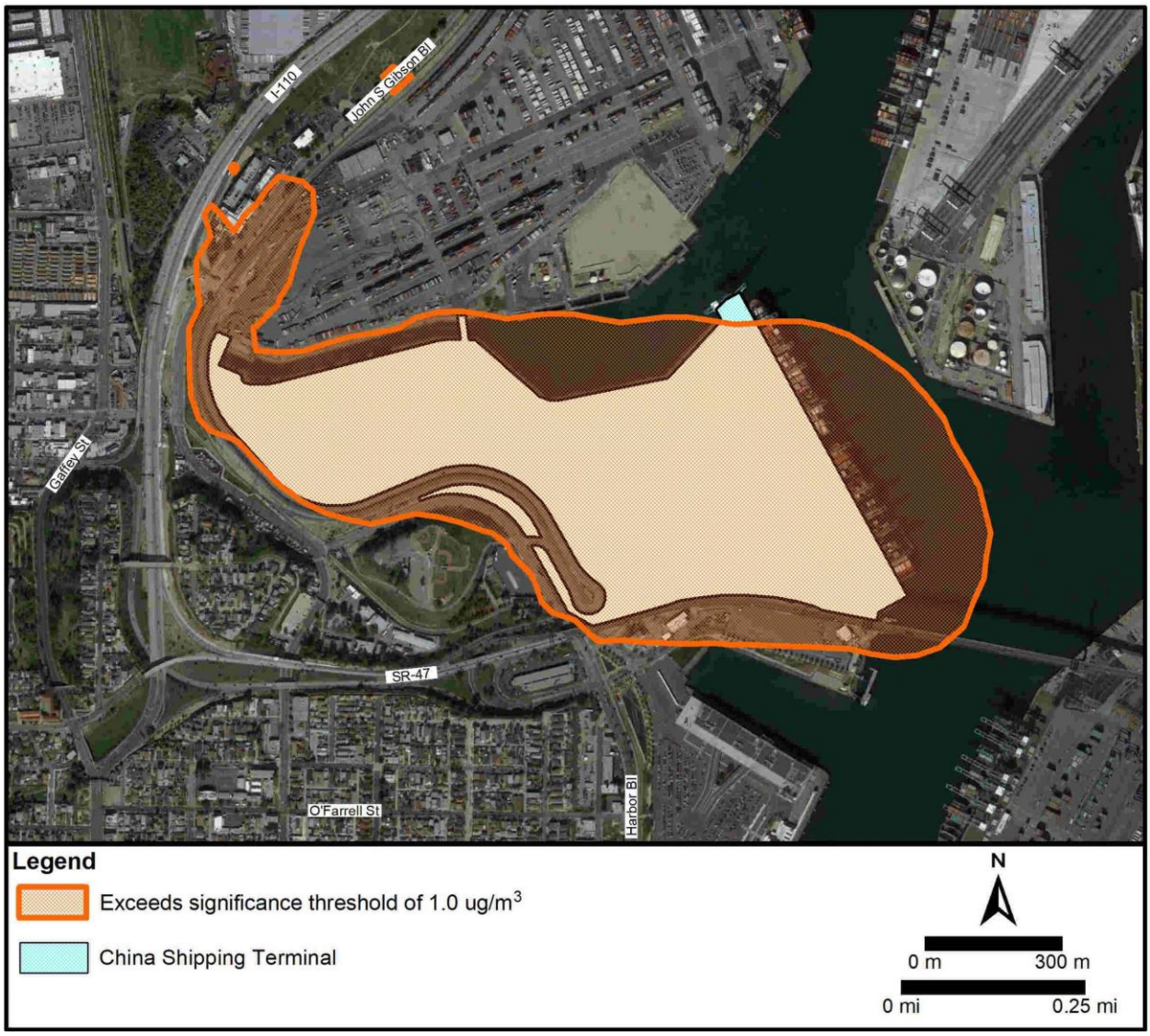


Figure B2-36. Area of Threshold Exceedance for the Revised Project; 2022 Annual PM_{10} Concentration Increments

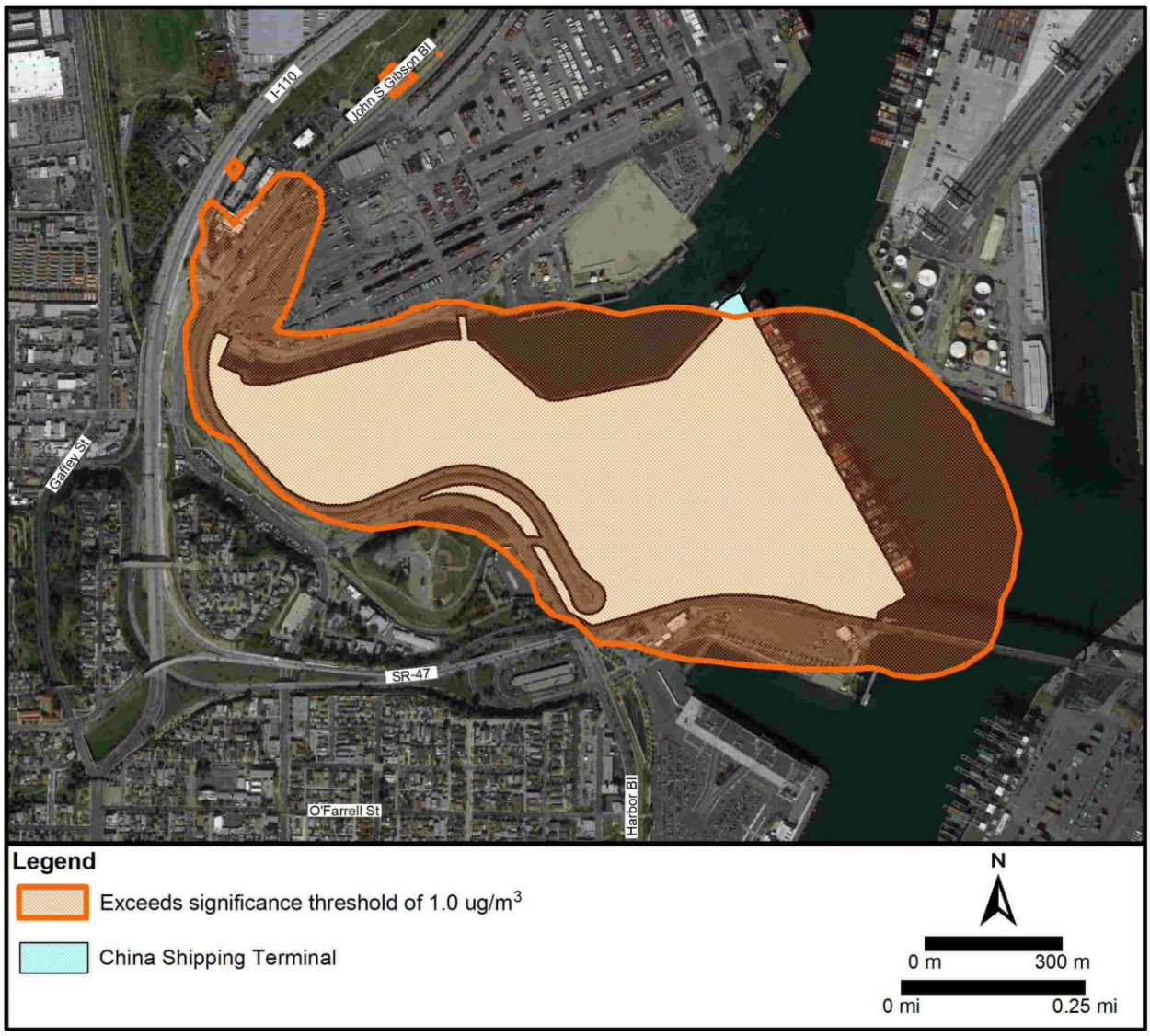


Figure B2-37. Area of Threshold Exceedance for the Revised Project; 2023 Annual PM_{10} Concentration Increments

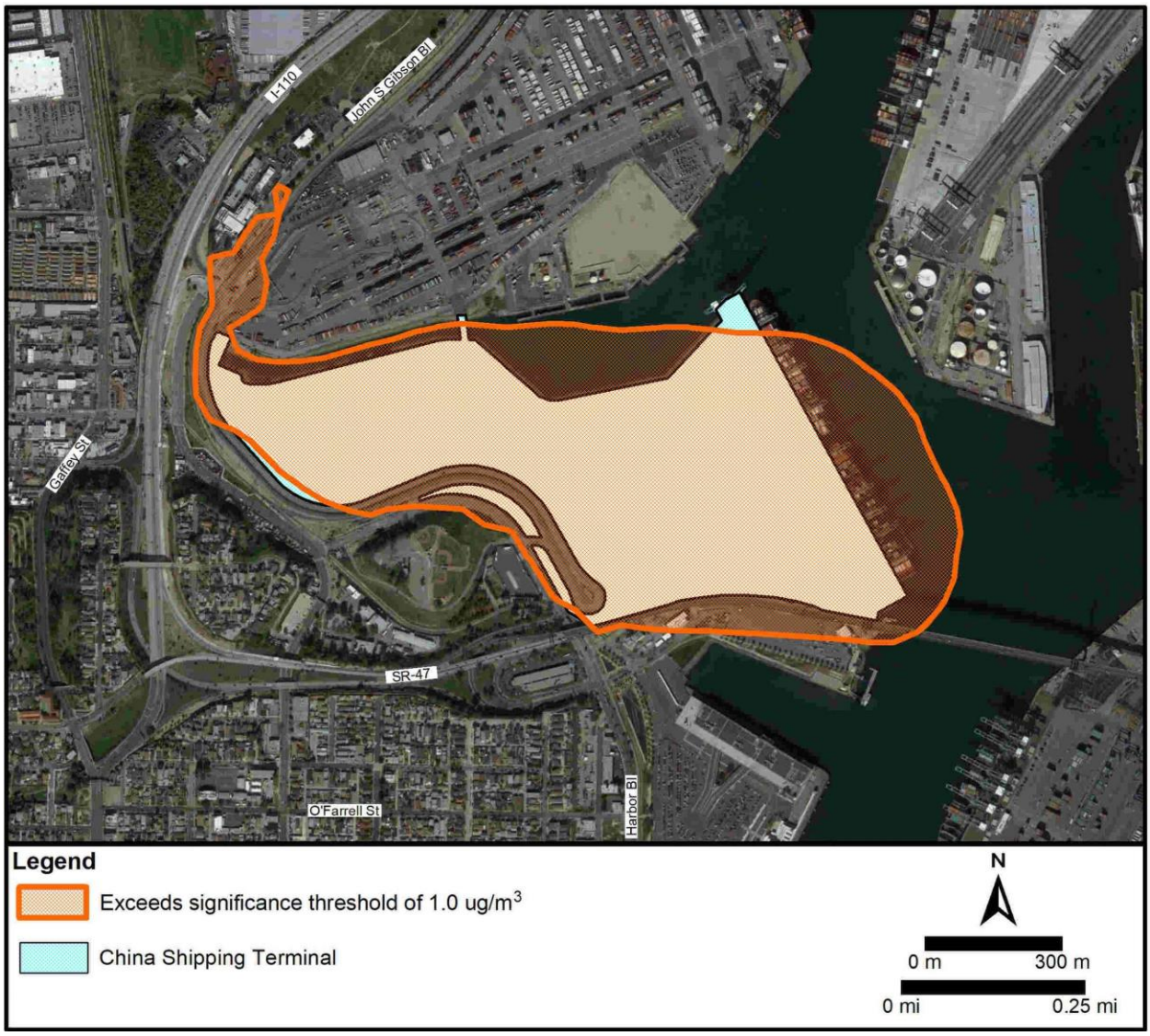


Figure B2-38. Area of Threshold Exceedance for the Revised Project; 2026 Annual PM_{10} Concentration Increments

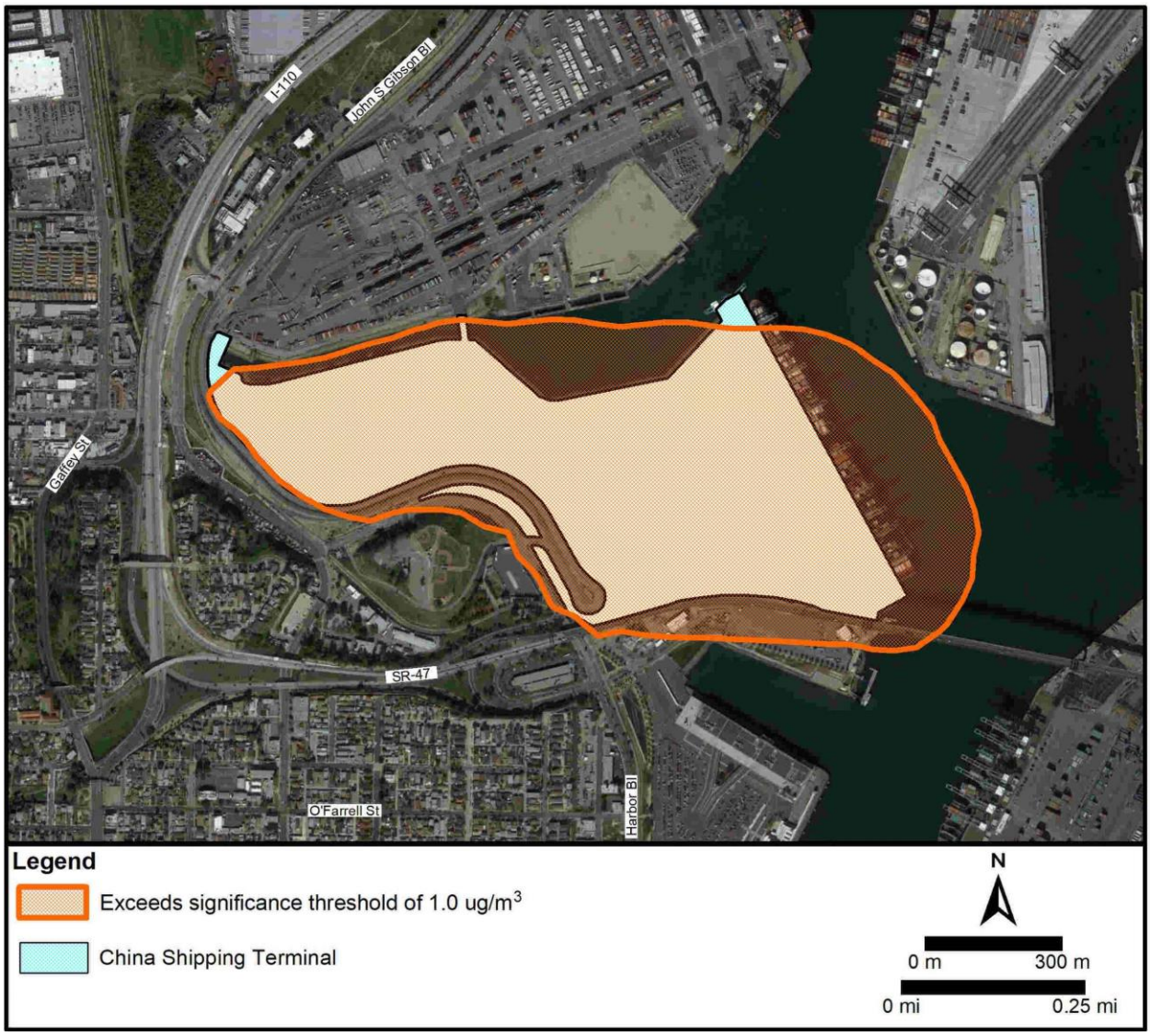


Figure B2-39. Area of Threshold Exceedance for the Revised Project; 2036 Annual PM_{10} Concentration Increments

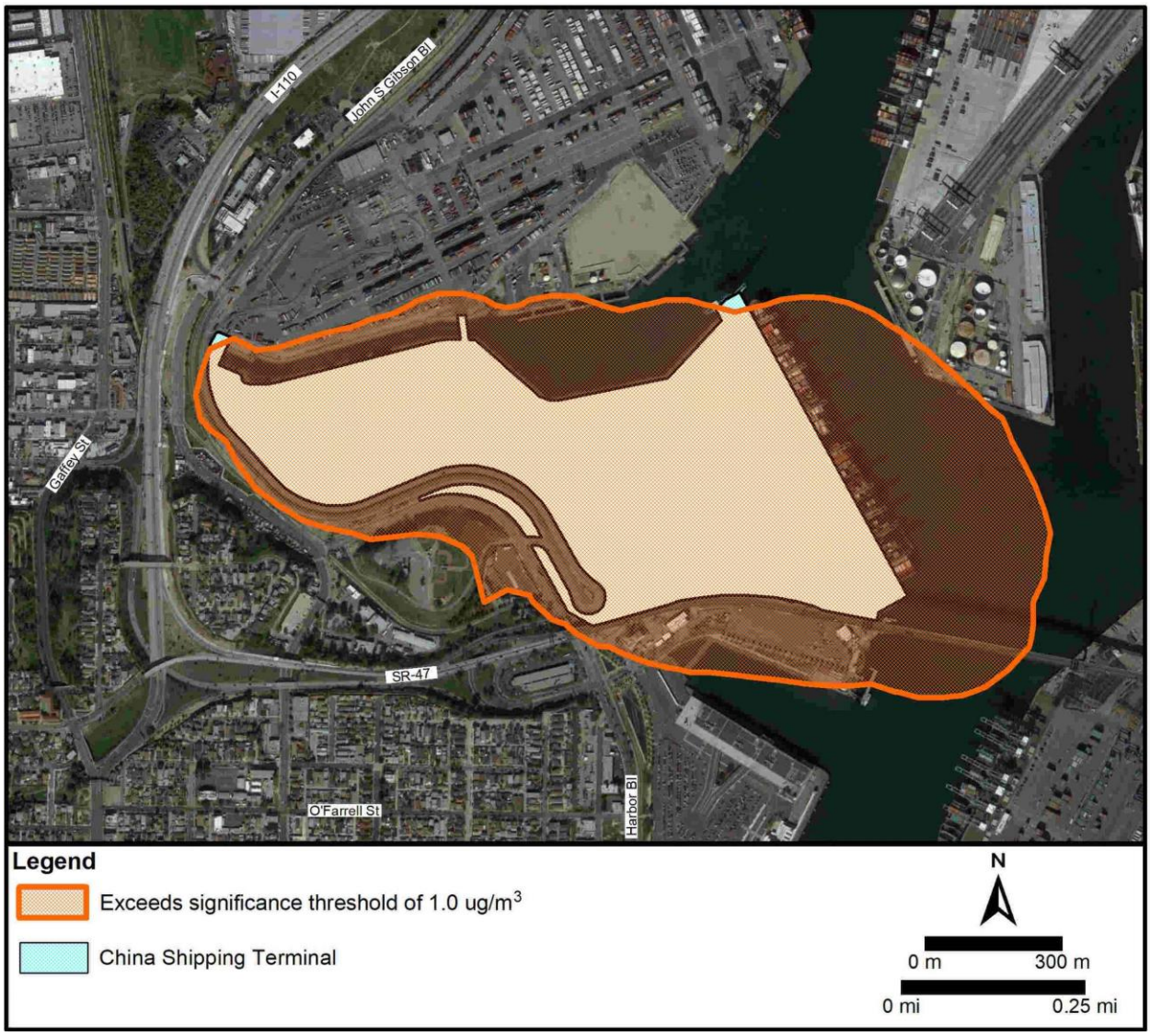


Figure B2-40. Area of Threshold Exceedance for the Revised Project; 2045 Annual PM_{10} Concentration Increments

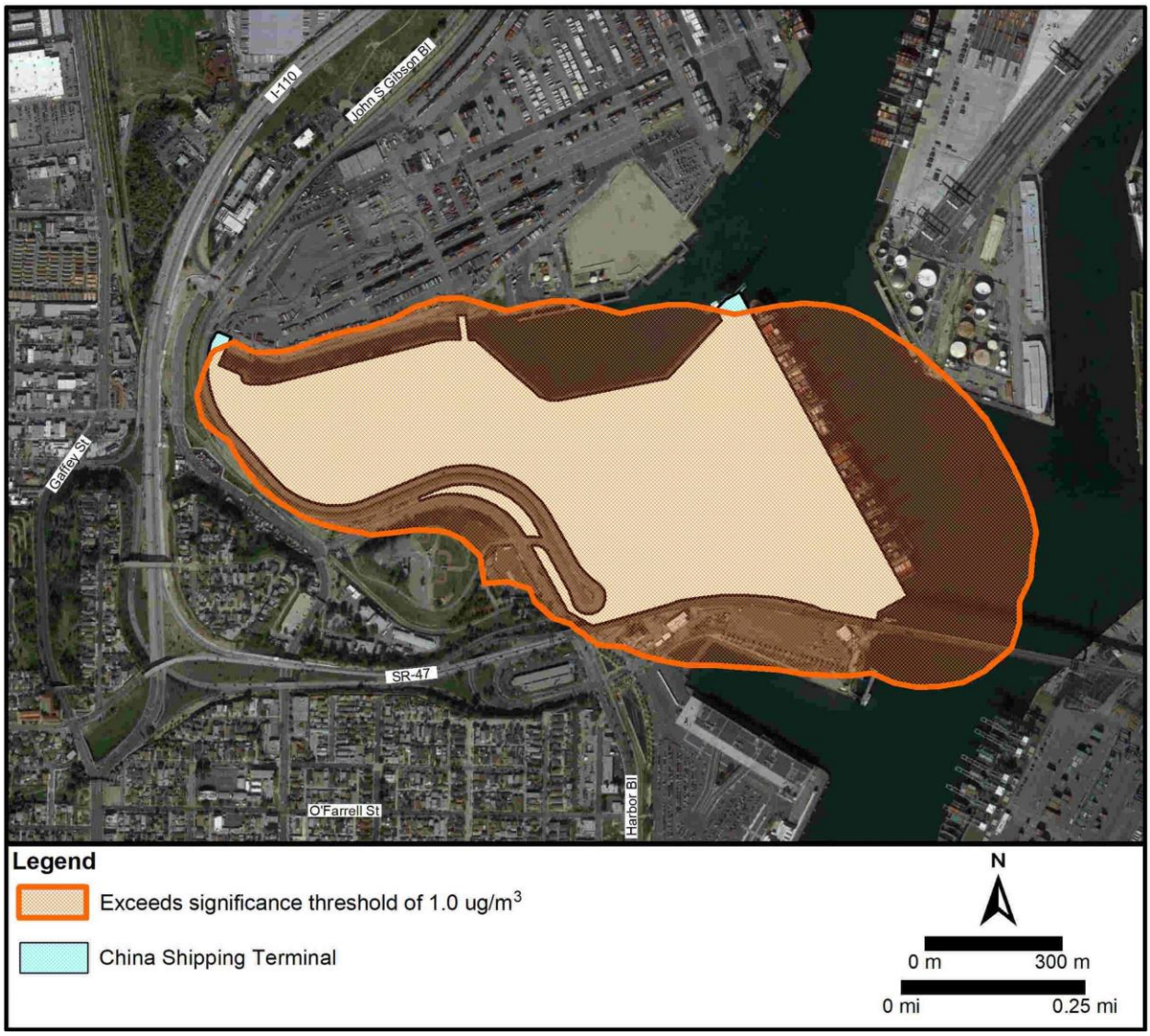


Figure B2-41. Area of Threshold Exceedance for the Revised Project; 2022 24-Hour $PM_{2.5}$ Concentration Increments

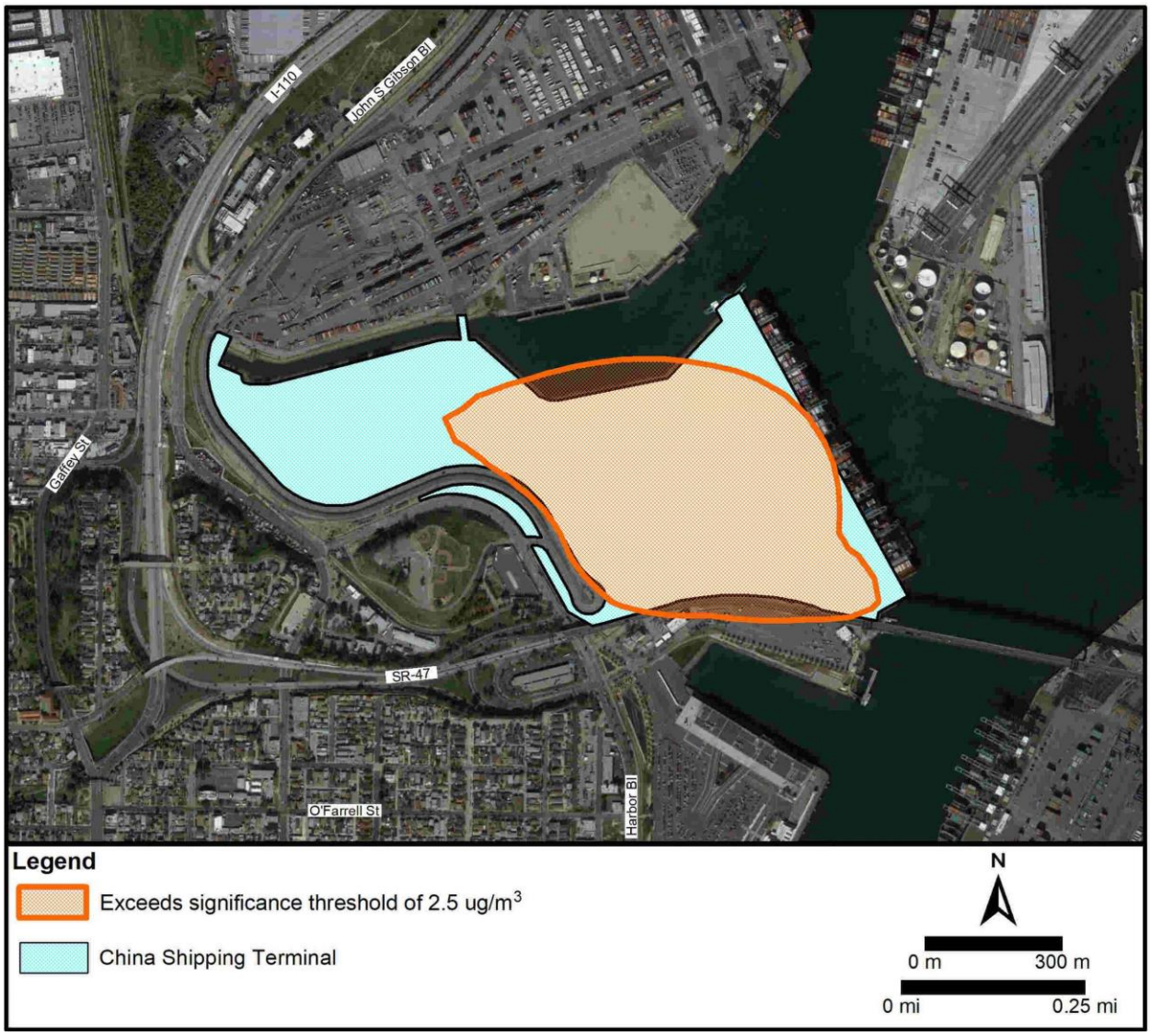
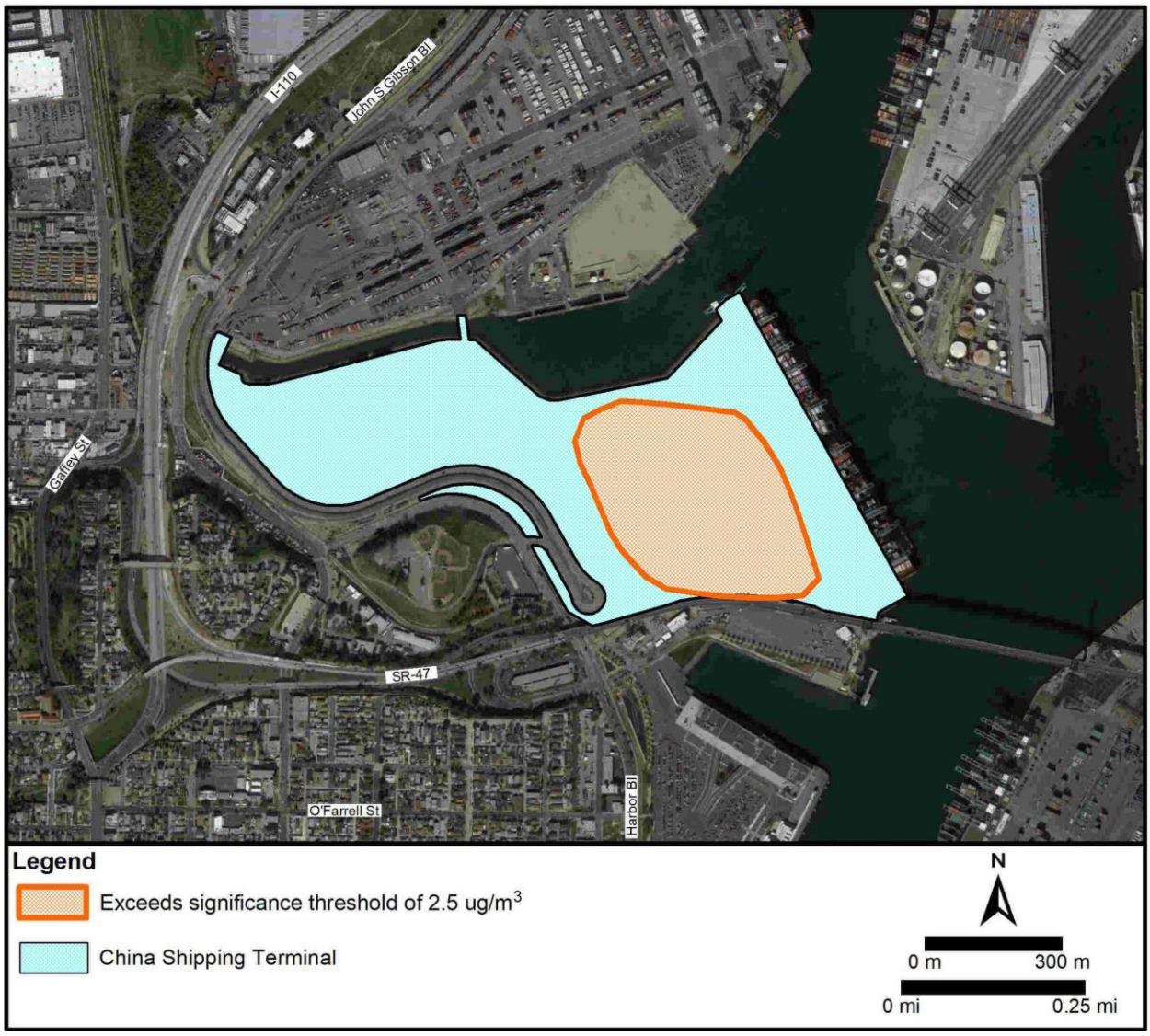


Figure B2-42. Area of Threshold Exceedance for the Revised Project; 2023 24-Hour $PM_{2.5}$ Concentration Increments



4.2 FEIR Mitigated Scenario

Impacts associated with the FEIR Mitigated Scenario are presented for informational purposes to enable a comparison to the Revised Project. Table B2-16 presents the maximum off-site NO_2 concentration impacts associated with the FEIR Mitigated Scenario in each analysis year. Results show that impacts would exceed the federal 1-hour NO_2 significance threshold in 2014. The state 1-hour and annual NO_2 thresholds would not be exceeded.

Table B2-17 presents the maximum off-site SO_2 and CO concentration impacts associated with the FEIR Mitigated Scenario. Because prior Port projects have shown that SO_2 and CO are unlikely to exceed the significance thresholds, a conservative screening approach was used for SO_2 and CO where each AERMOD source was modeled with its maximum emission increment over all analysis years. The screening results show that impacts would be below the SO_2 and CO significance thresholds in all analysis years.

Table B2-18 presents the maximum off-site PM_{10} and $PM_{2.5}$ concentration increments associated with the FEIR Mitigated Scenario in each analysis year. Results show that impacts would exceed the 24-hour PM_{10} significance threshold in 2014, 2020, 2021, 2022, 2023, 2026, 2036, and 2045; and the annual PM_{10} significance threshold in 2014, 2020, 2021, 2022, 2023, 2026, 2036, and 2045. Impacts would be below the $PM_{2.5}$ significance threshold in all analysis years.

Table B2-16. Maximum Off-Site Ambient NO_2 Concentrations Associated with the FEIR Mitigated Scenario

Pollutant	Averaging Period	Analysis Year	Background Concentration (µg/m³)[c]	Maximum Modeled Project Concentration Increment (µg/m³)[d]	Total Concentration (µg/m³)[a,e]	Significance Threshold (µg/m³)	Threshold Exceeded?
NO_2[b]	Federal 1-hour	2012	139	48.1	187	188	No
		2014	127	139.2	**266**	188	**Yes**
		2018	115	16.1	131	188	No
		2019	106	17.6	124	188	No
		2020	102	17.6	120	188	No
		2021	103	26.2	129	188	No
		2022	99	33.2	132	188	No
		2023	89	26.7	116	188	No
		2026	89	25.0	114	188	No
		2036	89	26.1	115	188	No
		2045	89	24.8	114	188	No
	State 1-hour	2012	185	54.0	239	339	No
		2014	173	144.9	318	339	No
		2018	164	24.4	188	339	No
		2019	143	26.7	170	339	No
		2020	134	23.6	158	339	No
		2021	134	31.2	165	339	No
		2022	134	40.7	175	339	No
		2023	113	34.1	147	339	No
		2026	113	35.5	149	339	No
		2036	113	30.2	143	339	No
		2045	113	28.5	142	339	No
	Annual	2012	40	6.3	46	57	No
		2014	34	19.3	53	57	No
		2018	28	0.6	29	57	No
		2019	25	0.7	26	57	No
		2020	25	1.3	26	57	No
		2021	26	3.0	29	57	No
		2022	26	3.2	29	57	No
		2023	26	2.8	29	57	No
		2026	26	0.7	27	57	No
		2036	26	0.3	26	57	No
		2045	26	0.3	26	57	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The federal 1-hour NO_2 modeled concentration represents the 98th percentile of the daily maximum 1-hour average concentrations averaged over five years of meteorological data. The state 1-hour NO_2 modeled concentration represents the maximum concentration.

[c] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).

[d] The Modeled Project Concentration Increment represents the modeled emission increases of the FEIR Mitigated Scenario relative to the 2008 Actual Baseline.

[e] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.

Table B2-17. Maximum Off-Site Ambient SO_2 and CO Concentrations Associated with the FEIR Mitigated Scenario

Pollutant	Averaging Period	Background Concentration (µg/m³)[b]	Maximum Modeled Project Concentration Increment (µg/m³)[c]	Total Concentration (µg/m³)[a,d]	Significance Threshold (µg/m³)	Threshold Exceeded?
SO_2	Federal 1-hour	61	2.9	64	196	No
	State 1-hour	420	2.9	423	655	No
	24-hour	34	0.2	34	105	No
CO	1-hour	8,839	1,768	10,607	23,000	No
	8-hour	3,444	1,226	4,670	10,000	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The background concentrations were obtained from the Wilmington Community Monitoring Station (Saints Peter and Paul School).

[c] The Modeled Project Concentration Increment represents the modeled emission increases of the FEIR Mitigated Scenario relative to the 2008 Actual Baseline.

[d] The Total Concentration equals the Background Concentration plus the Maximum Modeled Project Concentration Increment.

Table B2-18. Maximum Off-Site Ambient PM_{10} and $PM_{2.5}$ Concentration Increments Associated with the FEIR Mitigated Scenario

Pollutant	Averaging Period	Analysis Year	Maximum Modeled Project Concentration Increment ($\mu g/m^3$)[a,b,c]	Significance Threshold ($\mu g/m^3$)	Threshold Exceeded?
PM_{10}	24-hour	2012	1.5	2.5	No
		2014	**6.3**	2.5	**Yes**
		2018	1.9	2.5	No
		2019	2.0	2.5	No
		2020	**3.2**	2.5	**Yes**
		2021	**7.5**	2.5	**Yes**
		2022	**7.7**	2.5	**Yes**
		2023	**5.0**	2.5	**Yes**
		2026	**6.7**	2.5	**Yes**
		2036	**11.2**	2.5	**Yes**
		2045	**10.3**	2.5	**Yes**
	Annual	2012	0.5	1.0	No
		2014	**2.0**	1.0	**Yes**
		2018	0.6	1.0	No
		2019	0.7	1.0	No
		2020	**1.1**	1.0	**Yes**
		2021	**2.6**	1.0	**Yes**
		2022	**2.6**	1.0	**Yes**
		2023	**1.7**	1.0	**Yes**
		2026	**2.1**	1.0	**Yes**
		2036	**3.5**	1.0	**Yes**
		2045	**3.2**	1.0	**Yes**
$PM_{2.5}$	24-hour	2012	0.7	2.5	No
		2014	1.1	2.5	No
		2018	0.3	2.5	No
		2019	0.3	2.5	No
		2020	0.6	2.5	No
		2021	1.1	2.5	No
		2022	1.2	2.5	No
		2023	1.0	2.5	No
		2026	0.6	2.5	No
		2036	1.2	2.5	No
		2045	1.1	2.5	No

[a] Exceedances of the thresholds are indicated in bold.

[b] The Modeled Project Concentration Increment represents the modeled emission increases of the FEIR Mitigated Scenario relative to the 2008 Actual Baseline.

[c] Because the thresholds for PM_{10} and $PM_{2.5}$ are incremental thresholds, background concentrations are not added to the Maximum Modeled Project Concentration Increment.

Figures B2-43 and B2-44 show the locations of the maximum modeled concentrations of NO_2, SO_2, CO, PM_{10}, and $PM_{2.5}$ associated with the FEIR Mitigated Scenario. The locations in the figures correspond to the concentrations displayed in Tables B2-16, B2-17, and B2-18.

Figure B2-43. Locations of Maximum Modeled Pollutant Concentrations Associated with the FEIR Mitigated Scenario (far field)

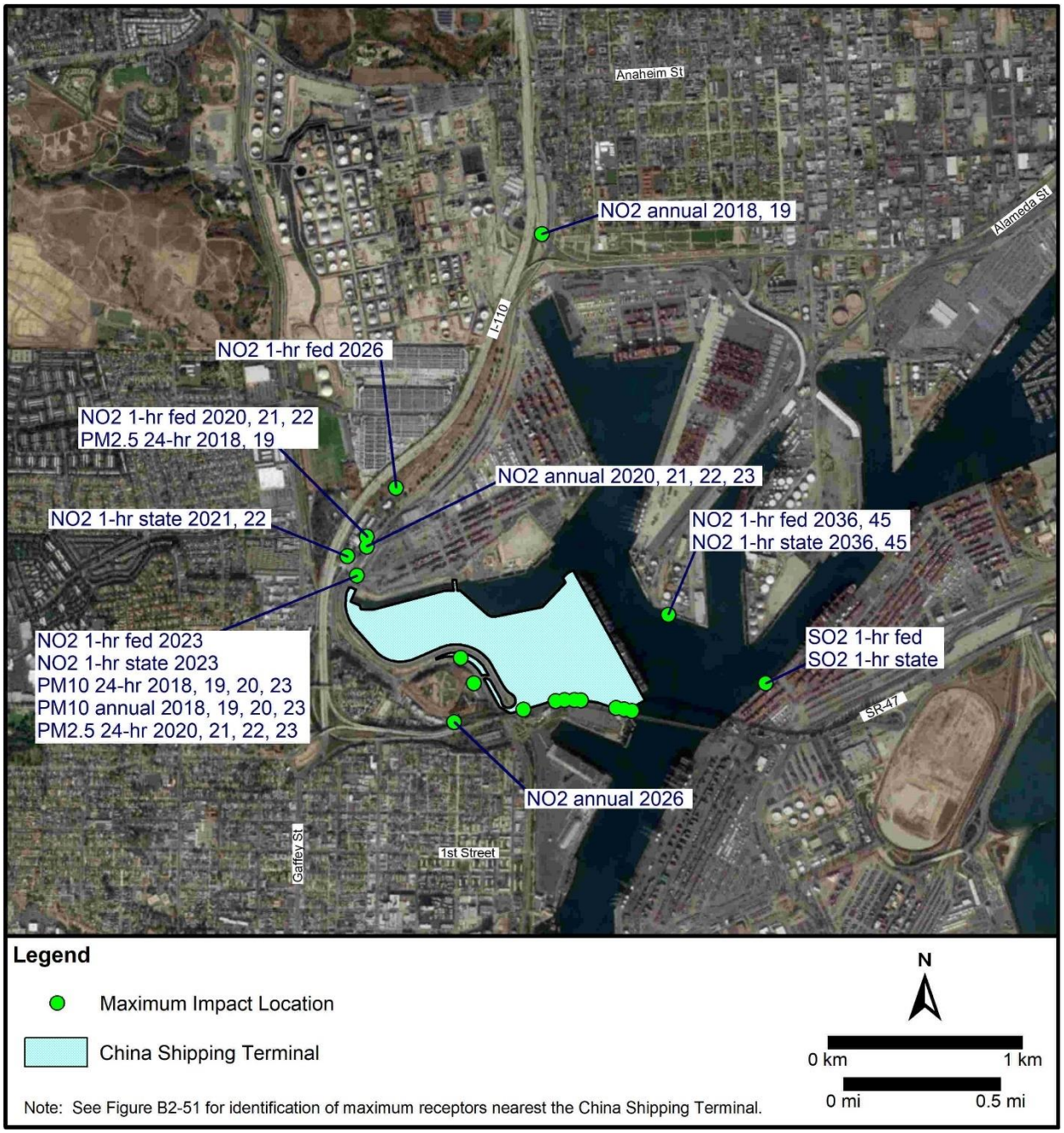


Figure B2-44. Locations of Maximum Modeled Pollutant Concentrations Associated with the FEIR Mitigated Scenario (near field)

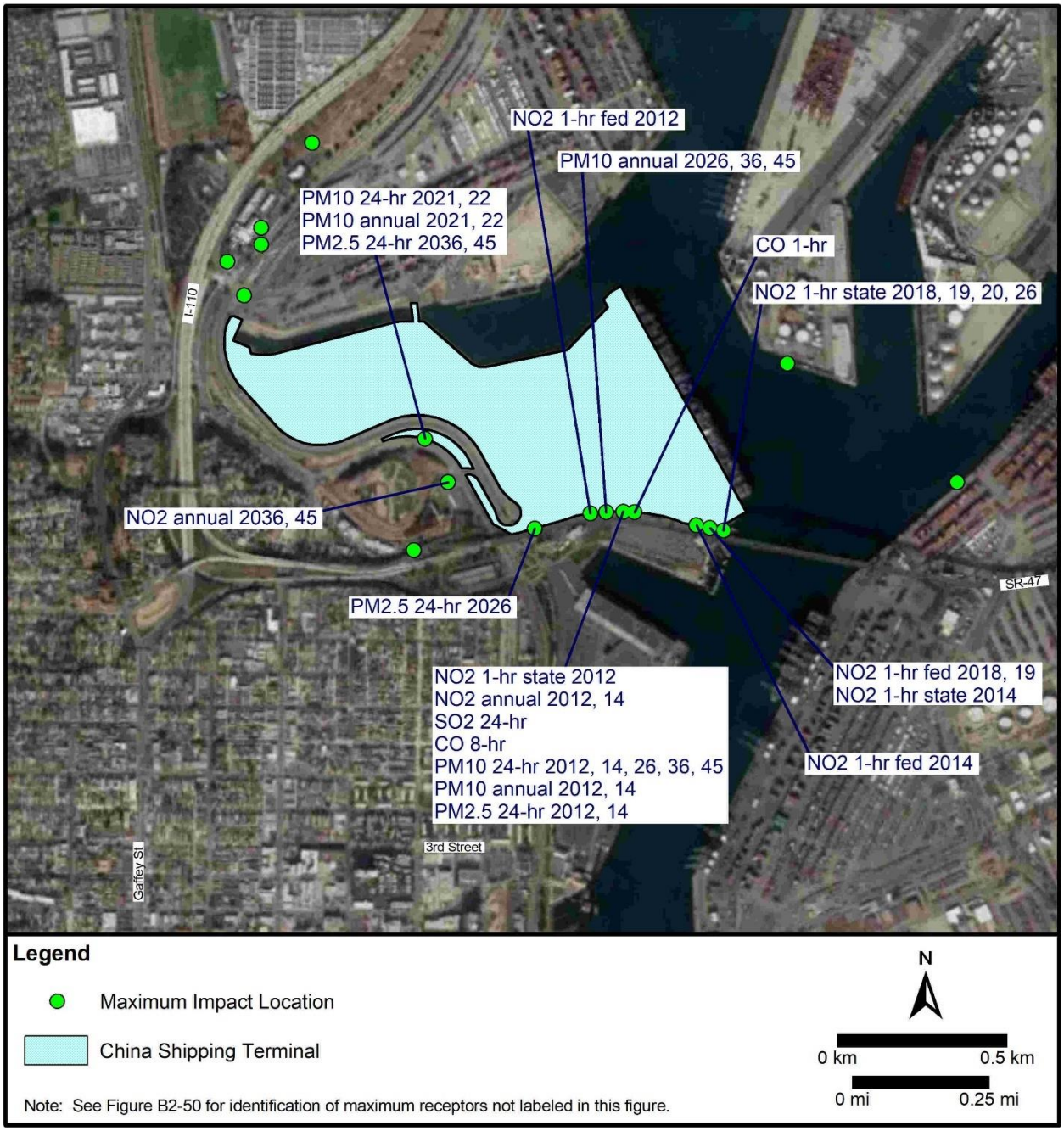


Figure B2-45 shows the area where the federal 1-hour NO_2 concentrations associated with the FEIR Mitigated Scenario would exceed the significance threshold.

Figures B2-46 through B2-53 show the areas where the 24-hour PM_{10} concentration increments associated with the FEIR Mitigated Scenario would exceed the significance threshold. Figures B2-54 through B2-61 show the areas where the annual PM_{10} concentration increments associated with the FEIR Mitigated Scenario would exceed the significance threshold.

Figure B2-45. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2014 Federal 1-Hour NO_2 Concentrations

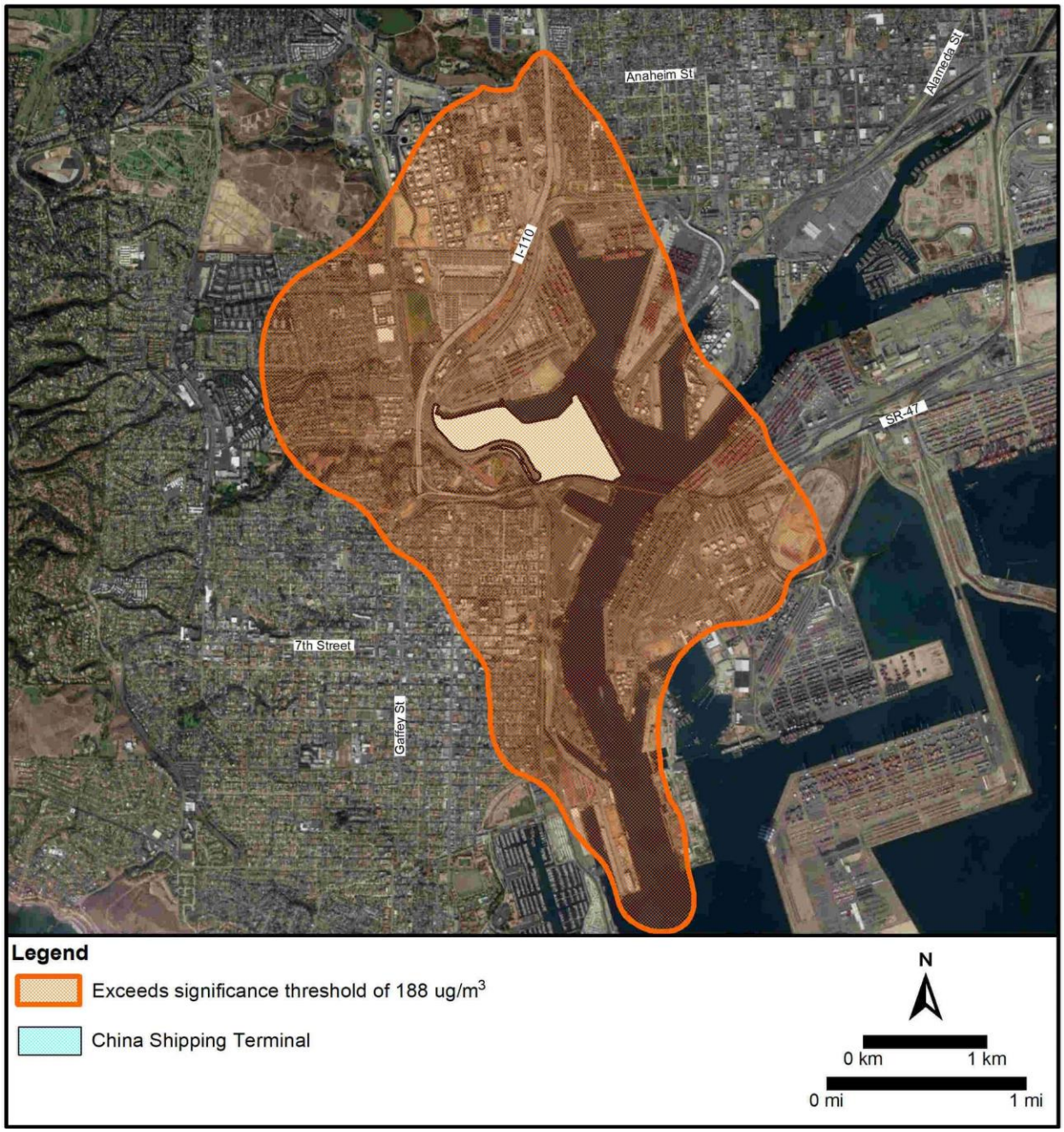


Figure B2-46. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2014 24-Hour PM_{10} Concentration Increments

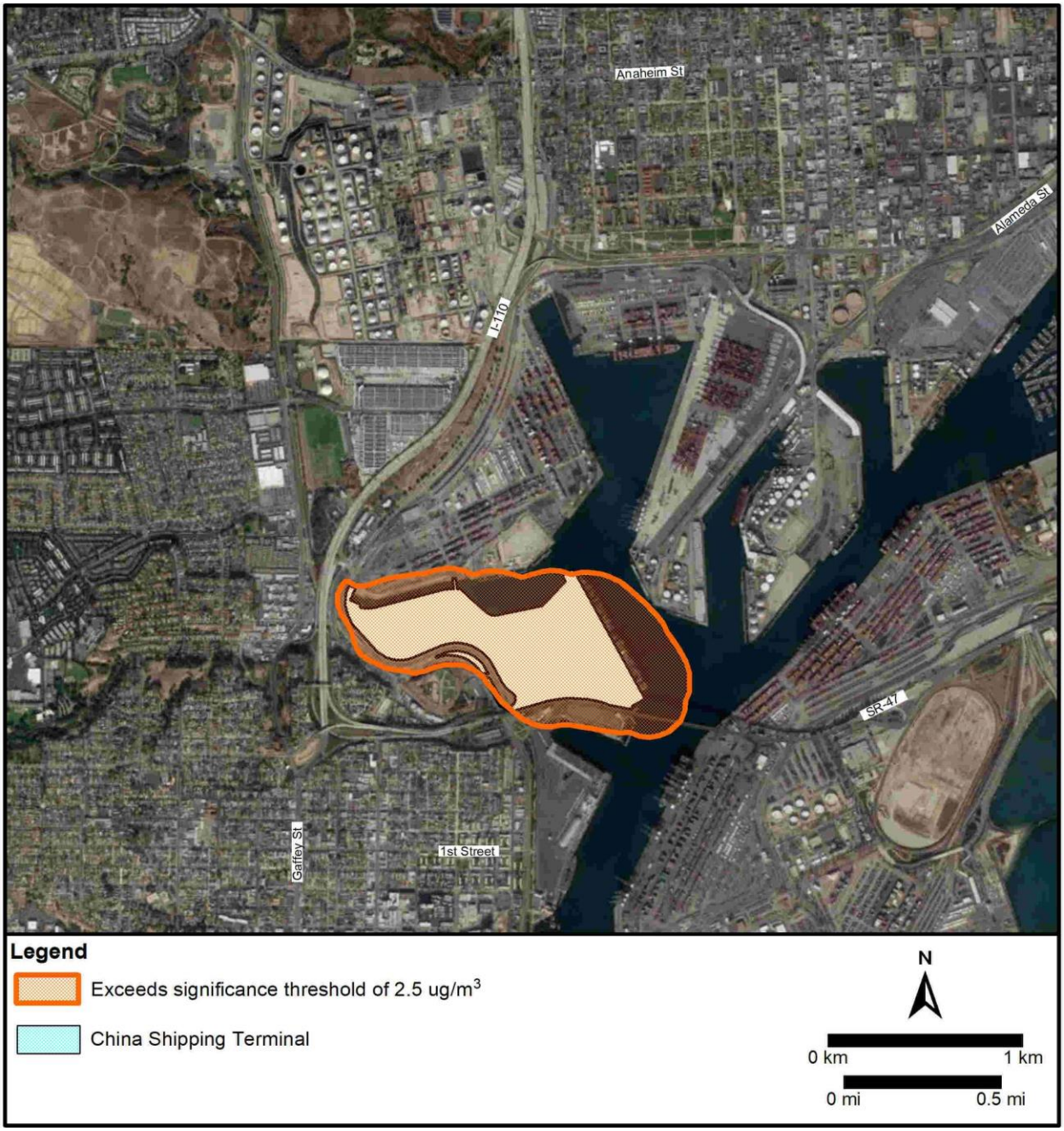


Figure B2-47. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2020 24-Hour PM_{10} Concentration Increments

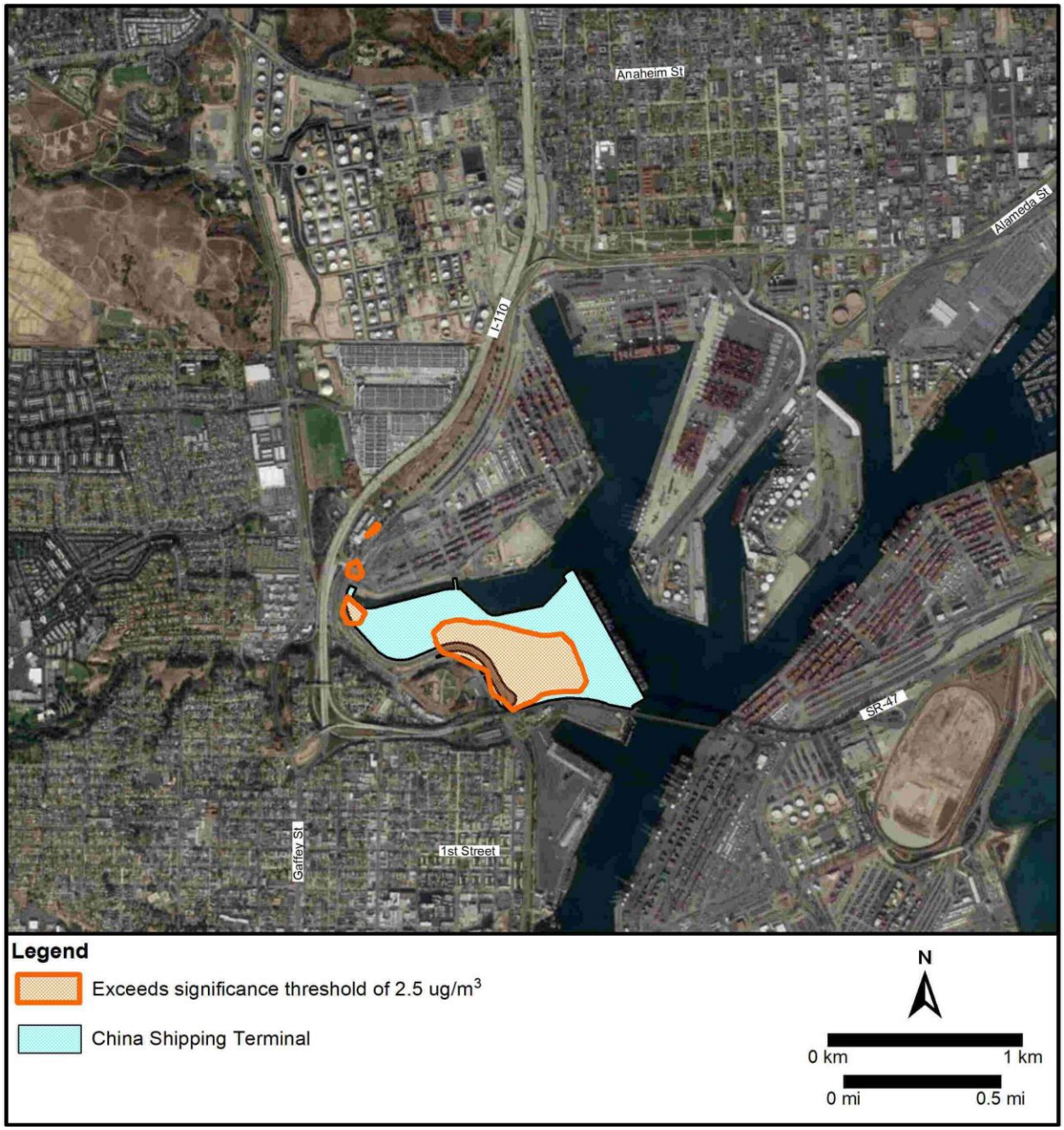


Figure B2-48. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2021 24-Hour PM_{10} Concentration Increments

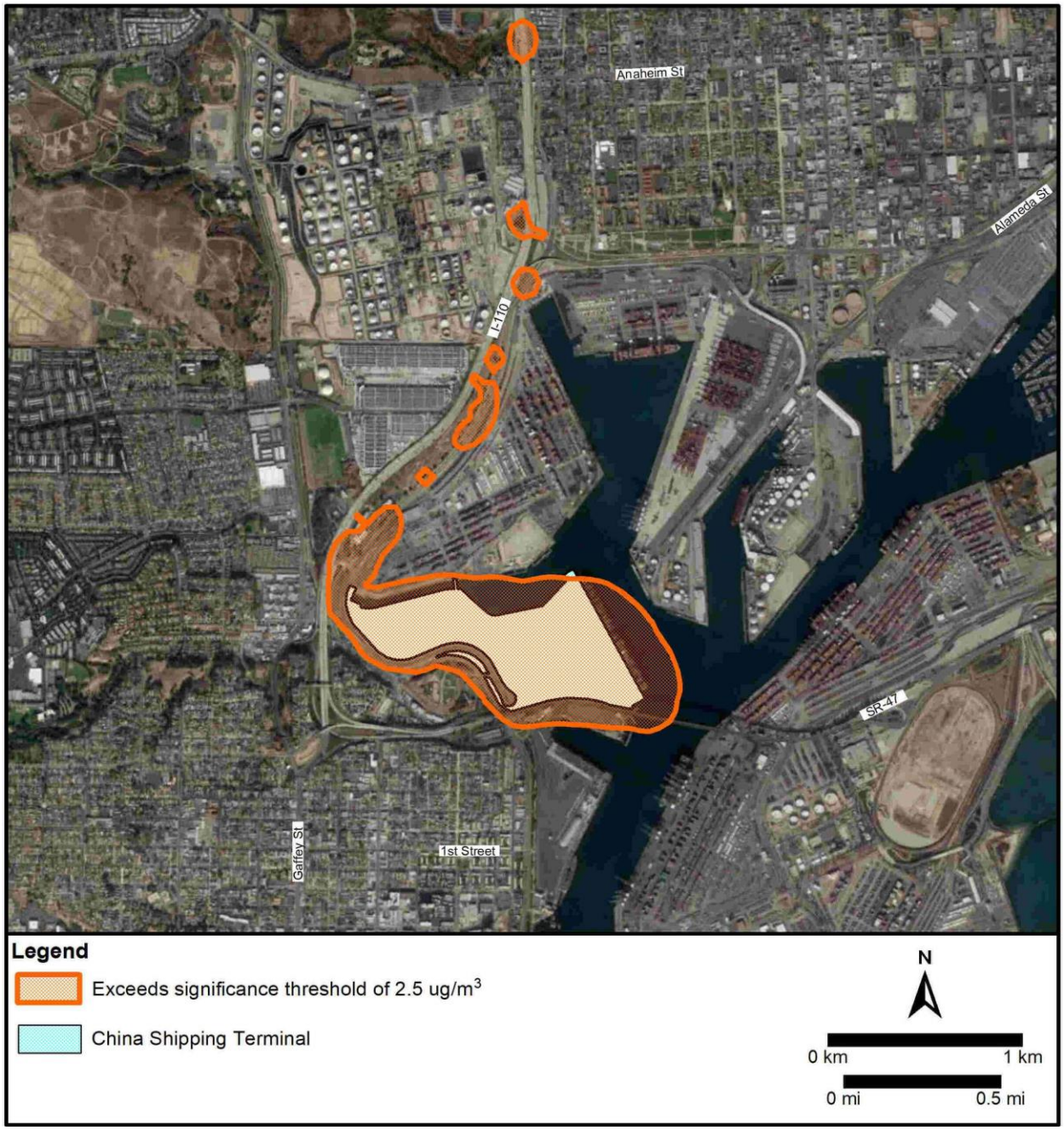


Figure B2-49. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2022 24-Hour PM_{10} Concentration Increments

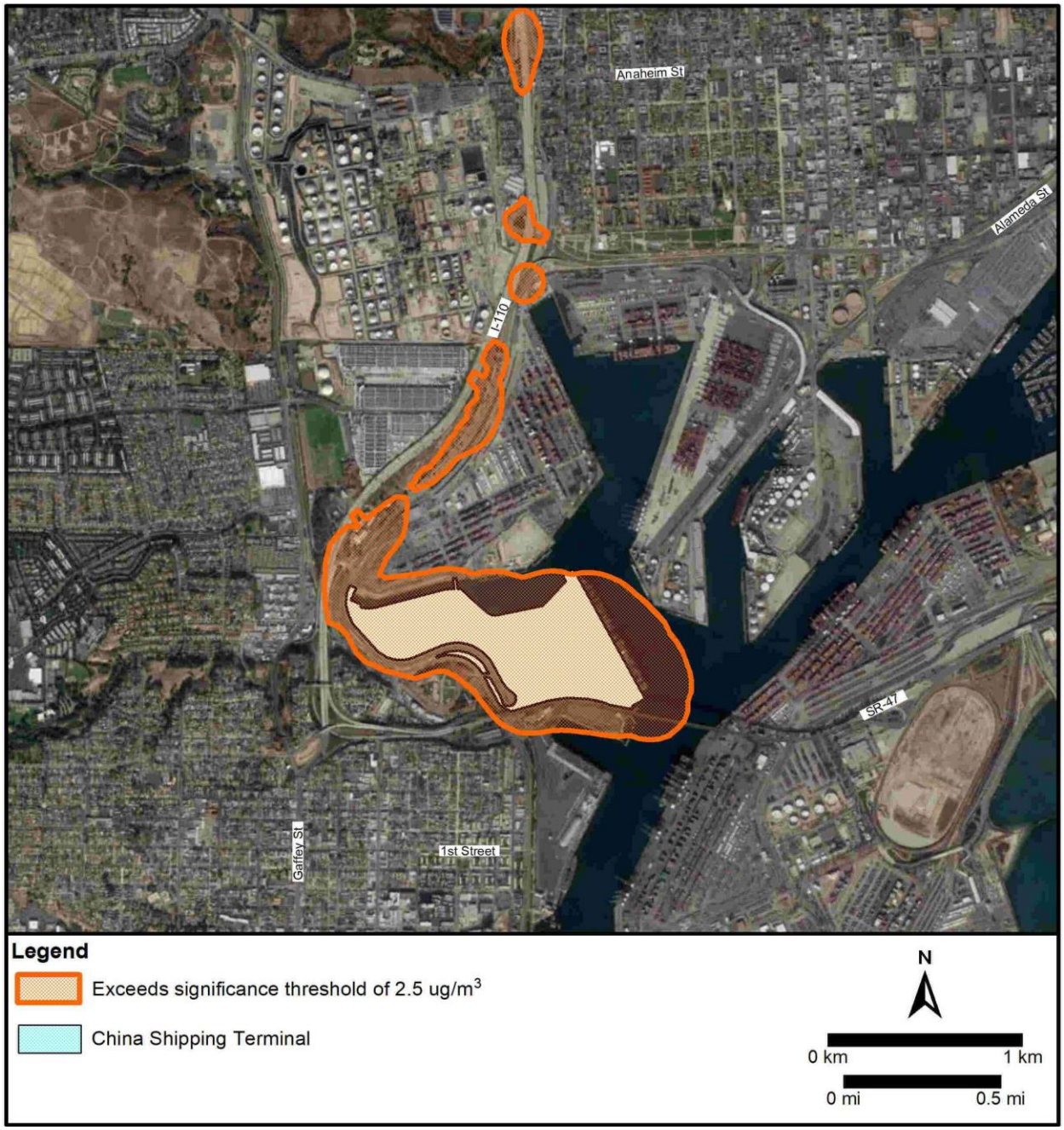


Figure B2-50. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2023 24-Hour PM_{10} Concentration Increments

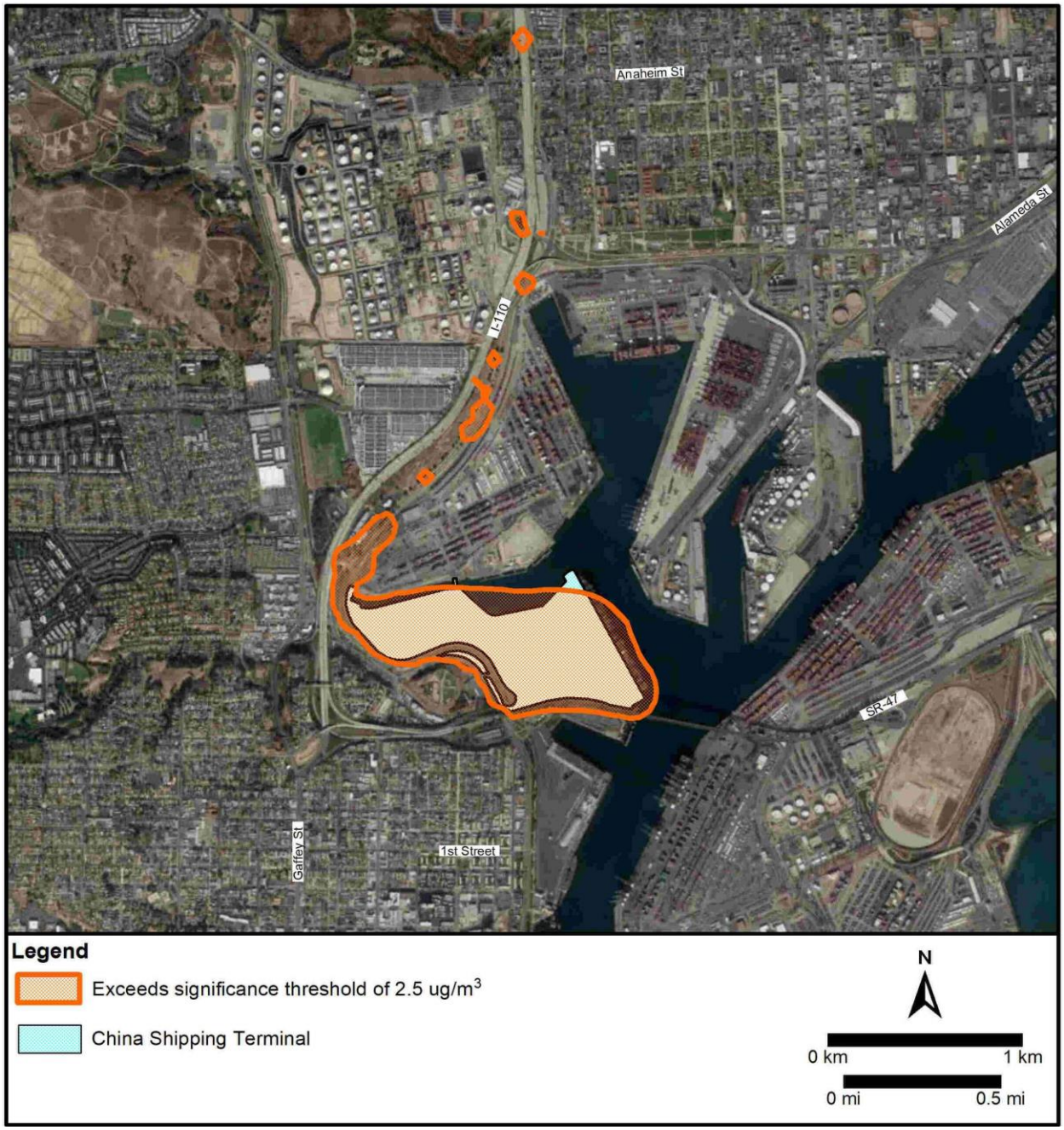


Figure B2-51. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2026 24-Hour PM_{10} Concentration Increments

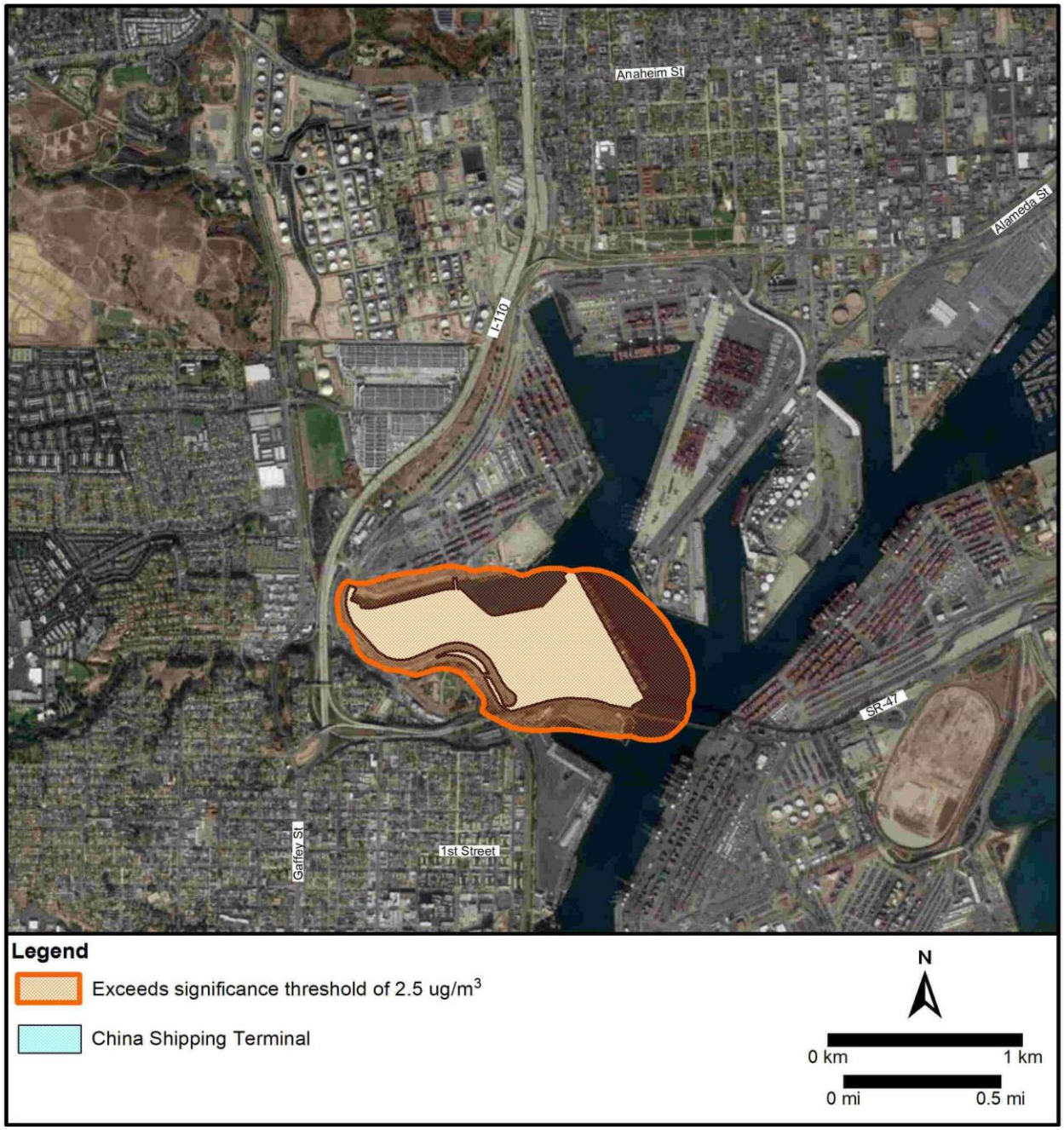


Figure B2-52. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2036 24-Hour PM_{10} Concentration Increments

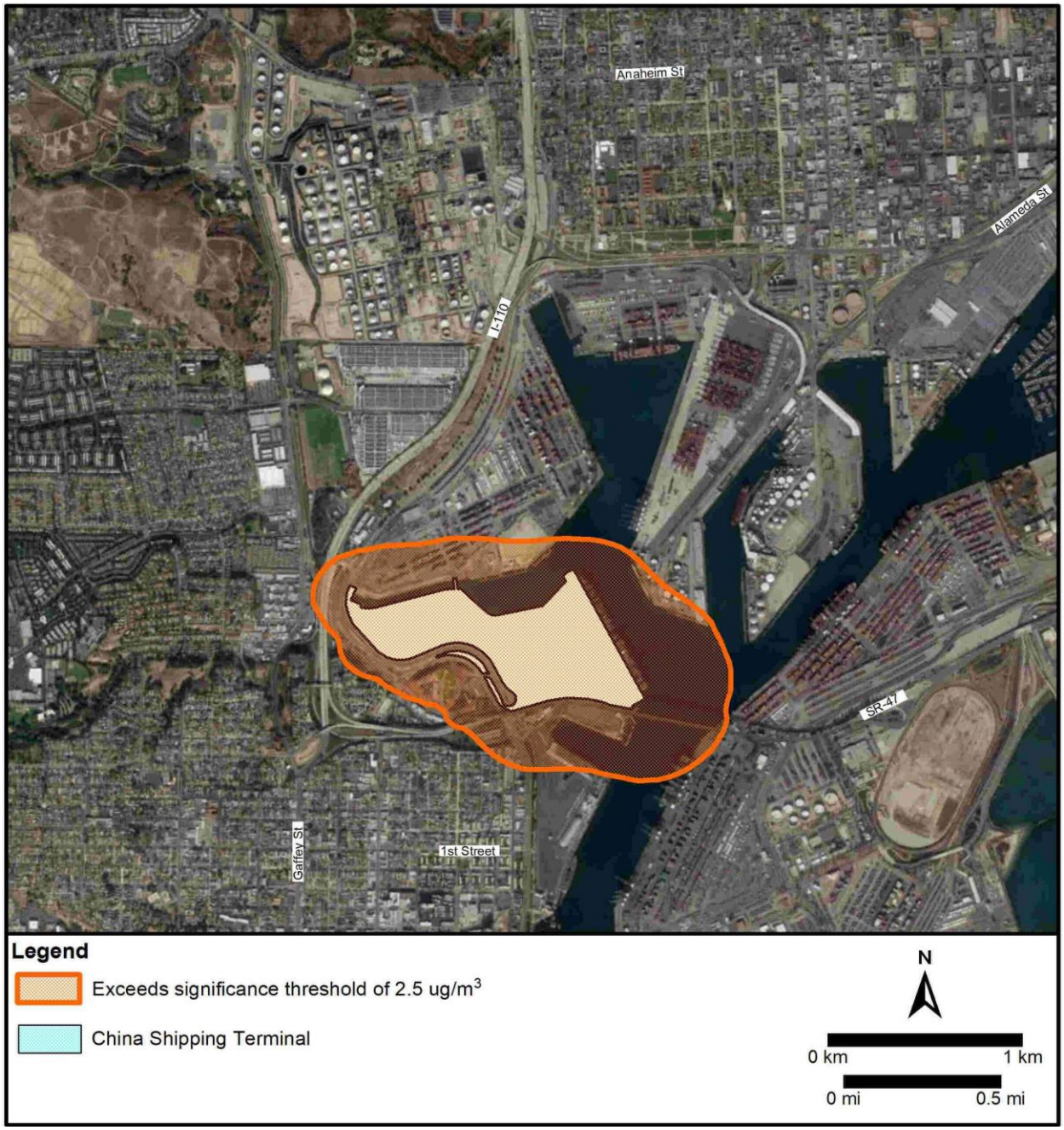


Figure B2-53. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2045 24-Hour PM_{10} Concentration Increments

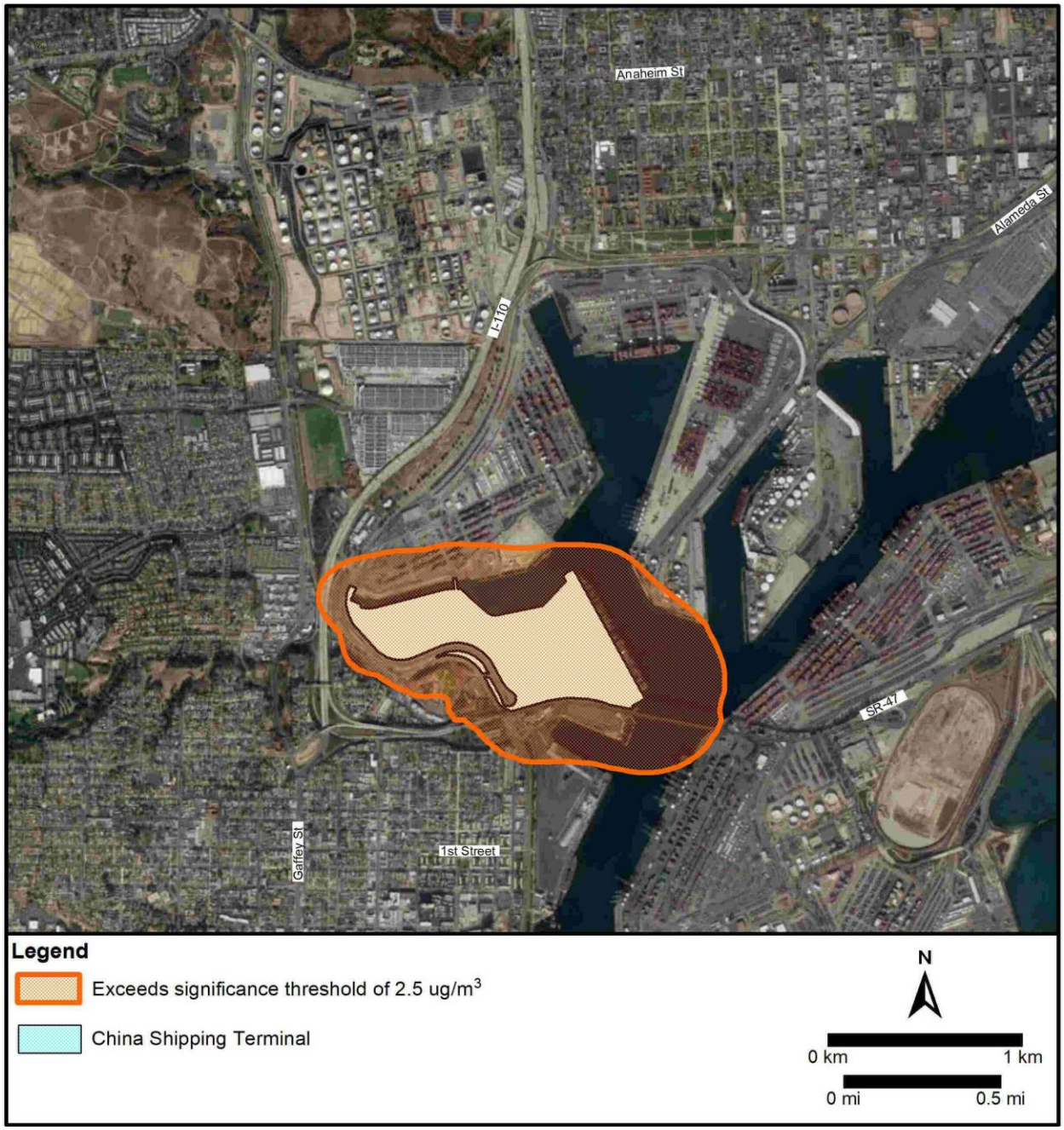


Figure B2-54. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2014 Annual PM_{10} Concentration Increments

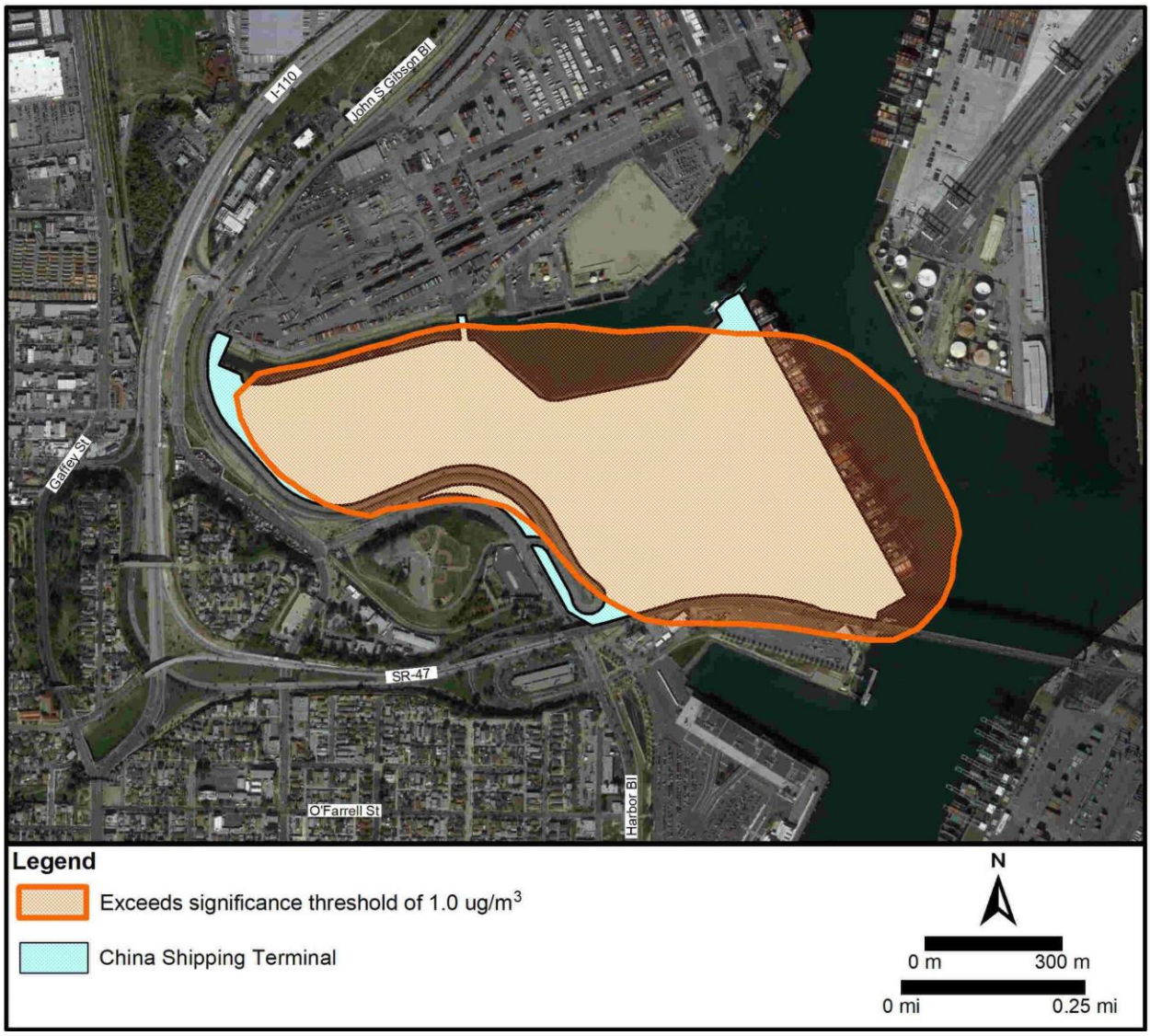


Figure B2-55. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2020 Annual PM_{10} Concentration Increments

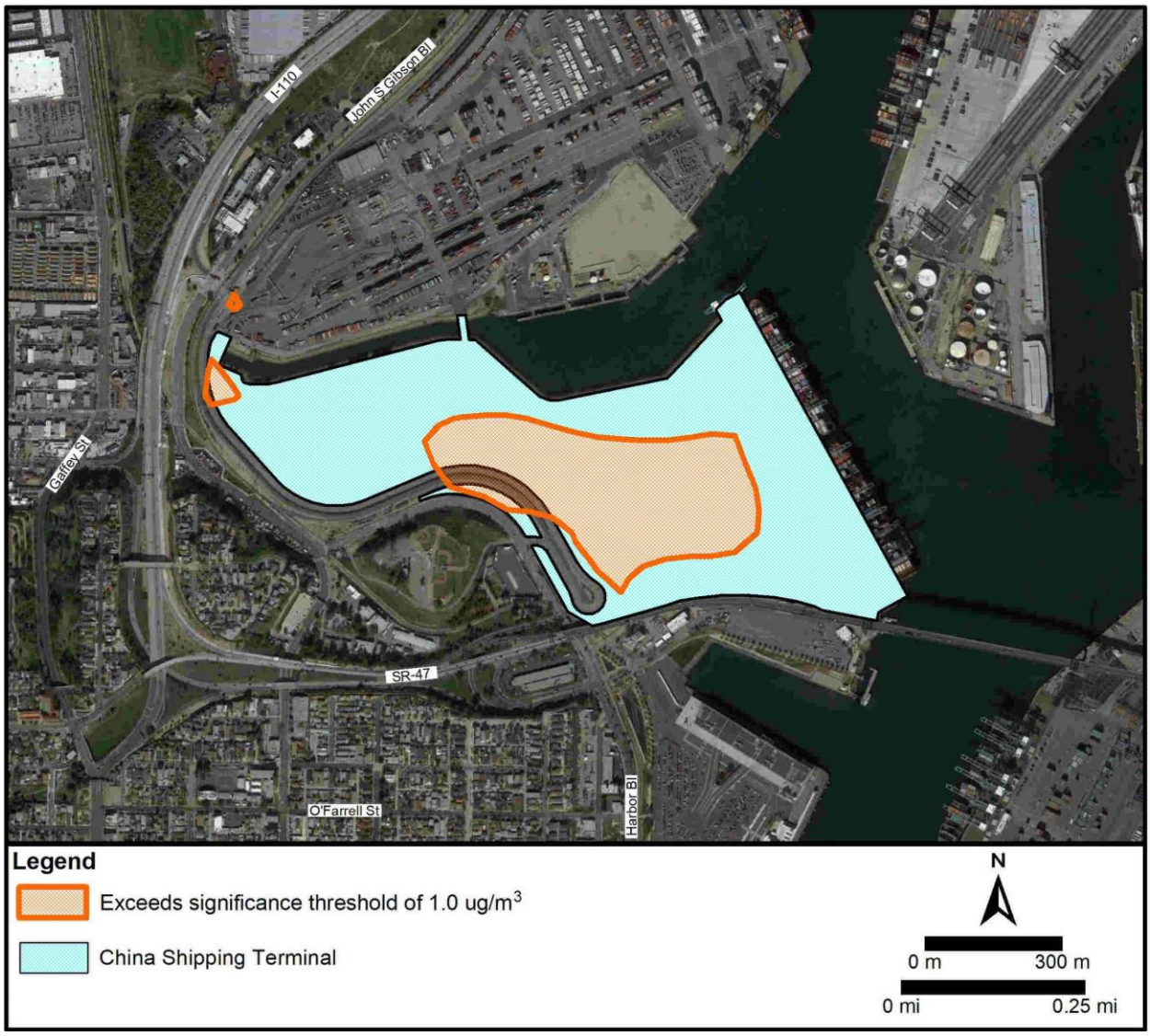


Figure B2-56. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2021 Annual PM_{10} Concentration Increments

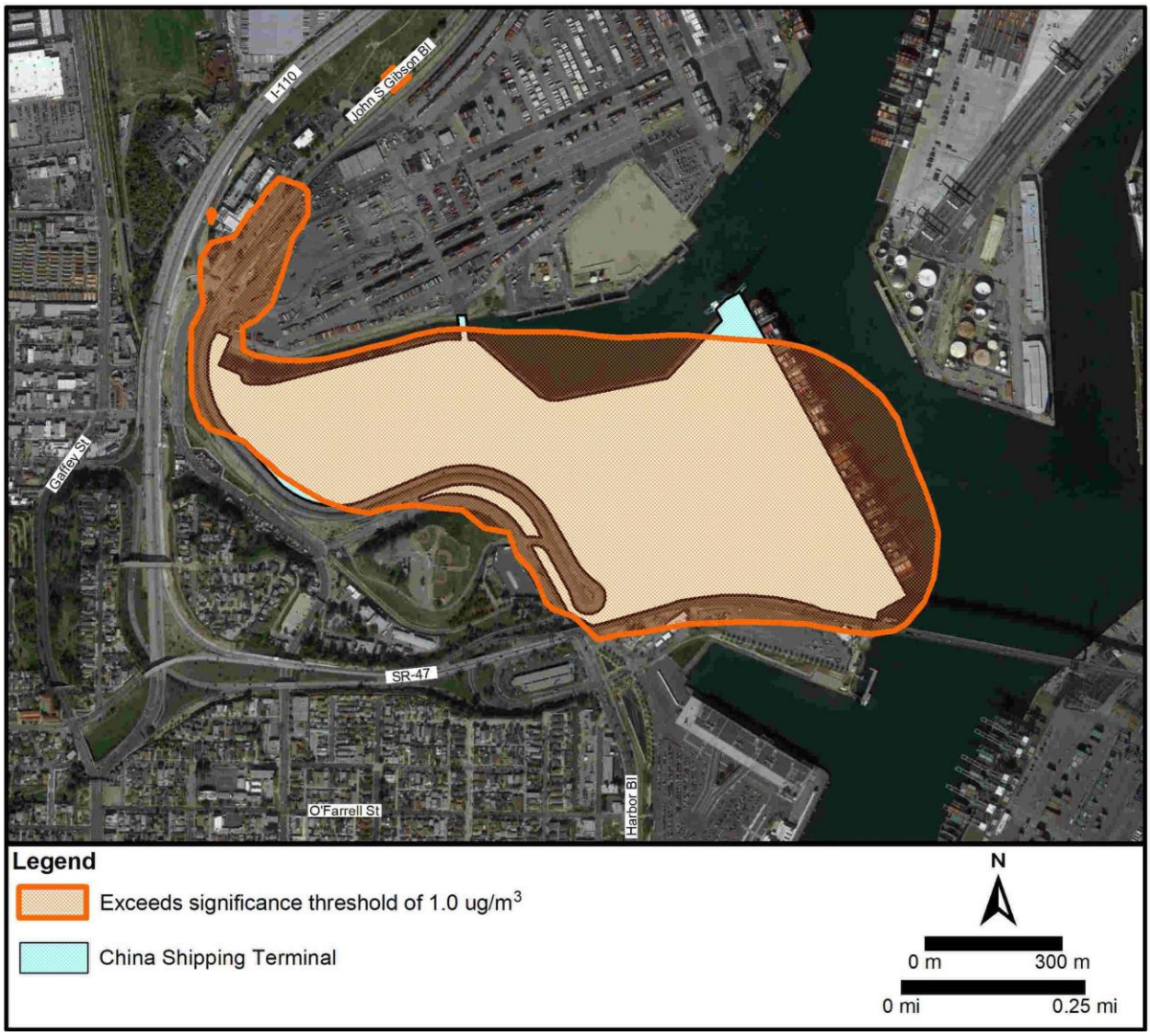


Figure B2-57. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2022 Annual PM_{10} Concentration Increments

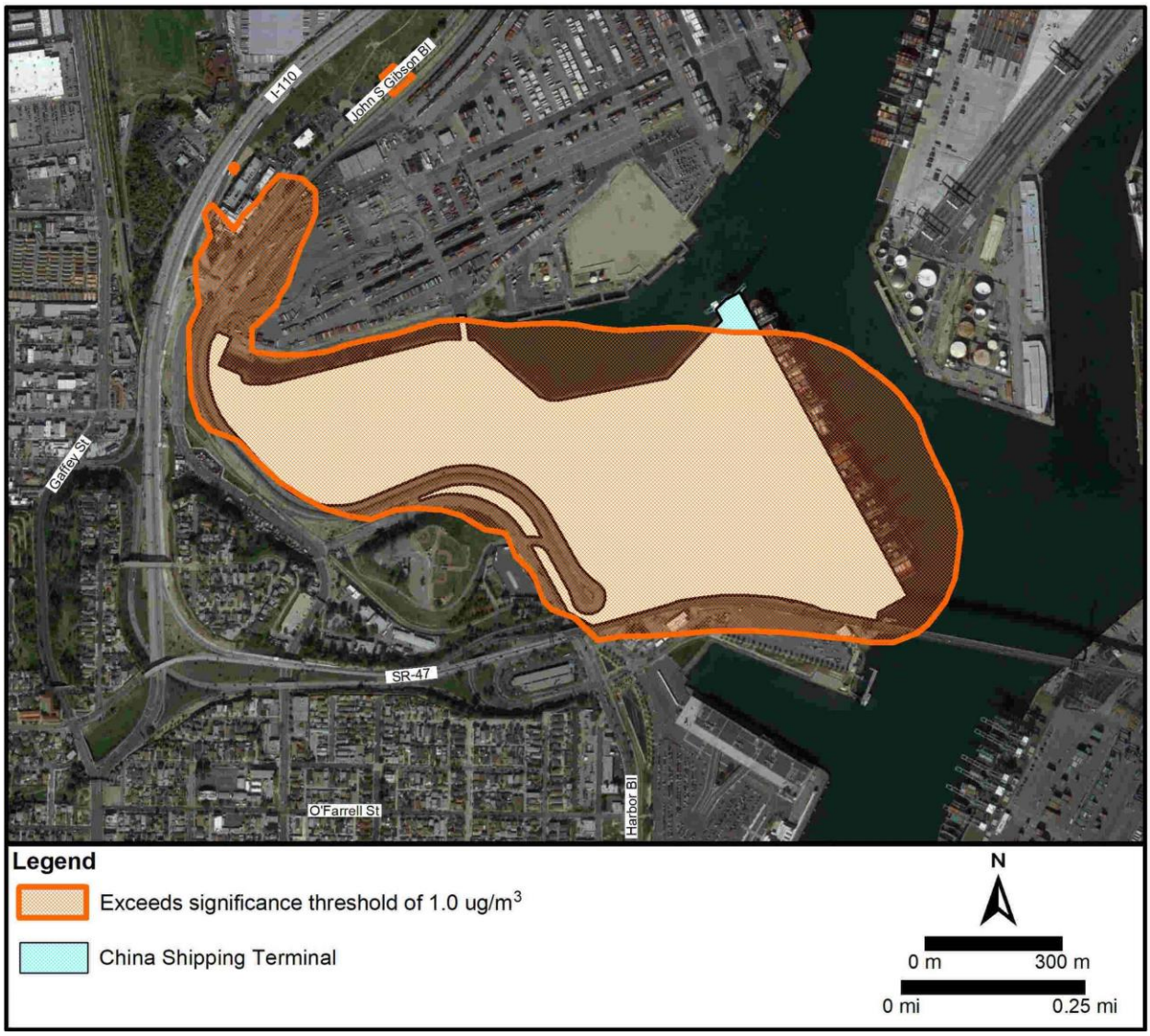


Figure B2-58. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2023 Annual PM_{10} Concentration Increments

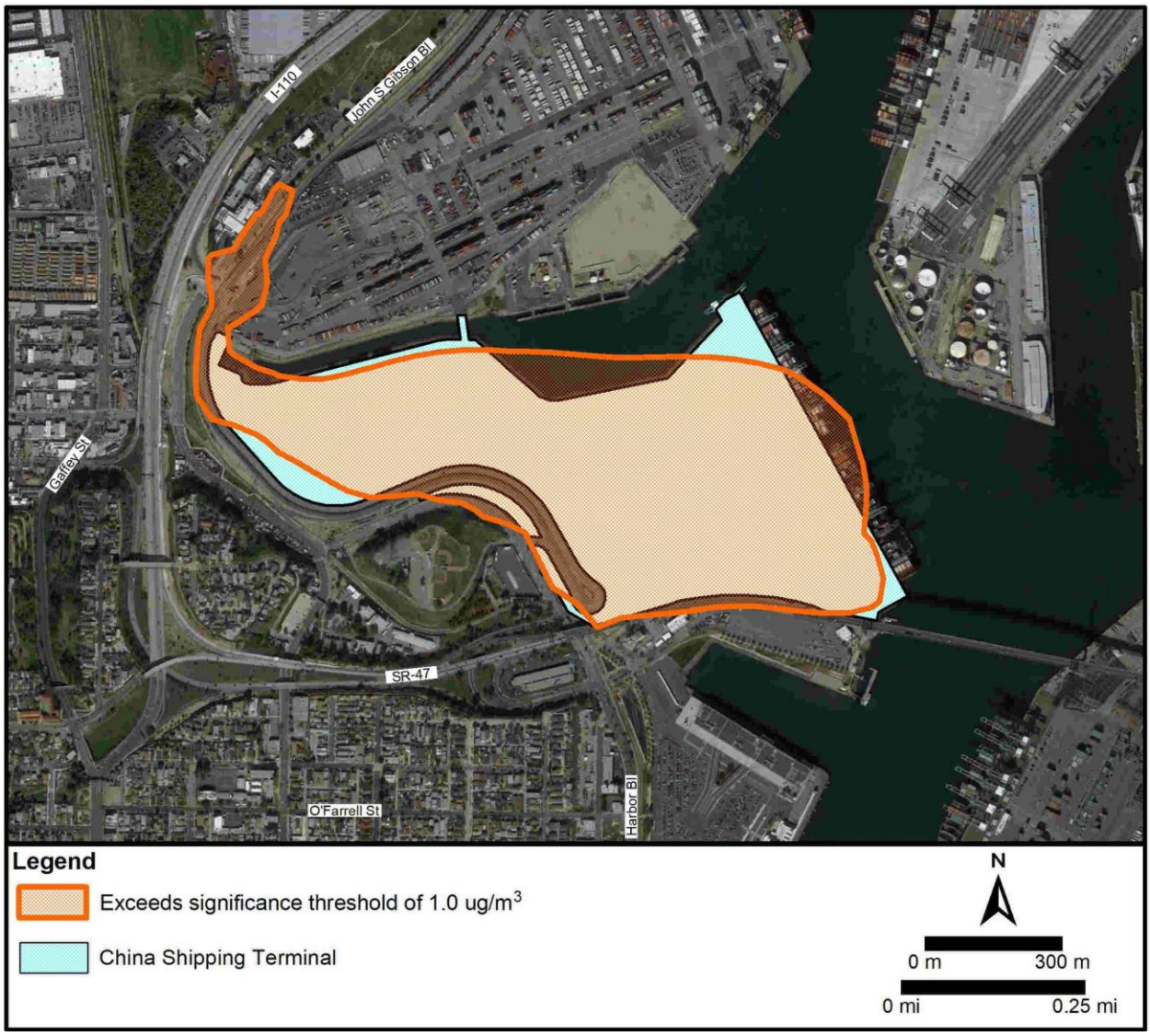


Figure B2-59. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2026 Annual PM_{10} Concentration Increments

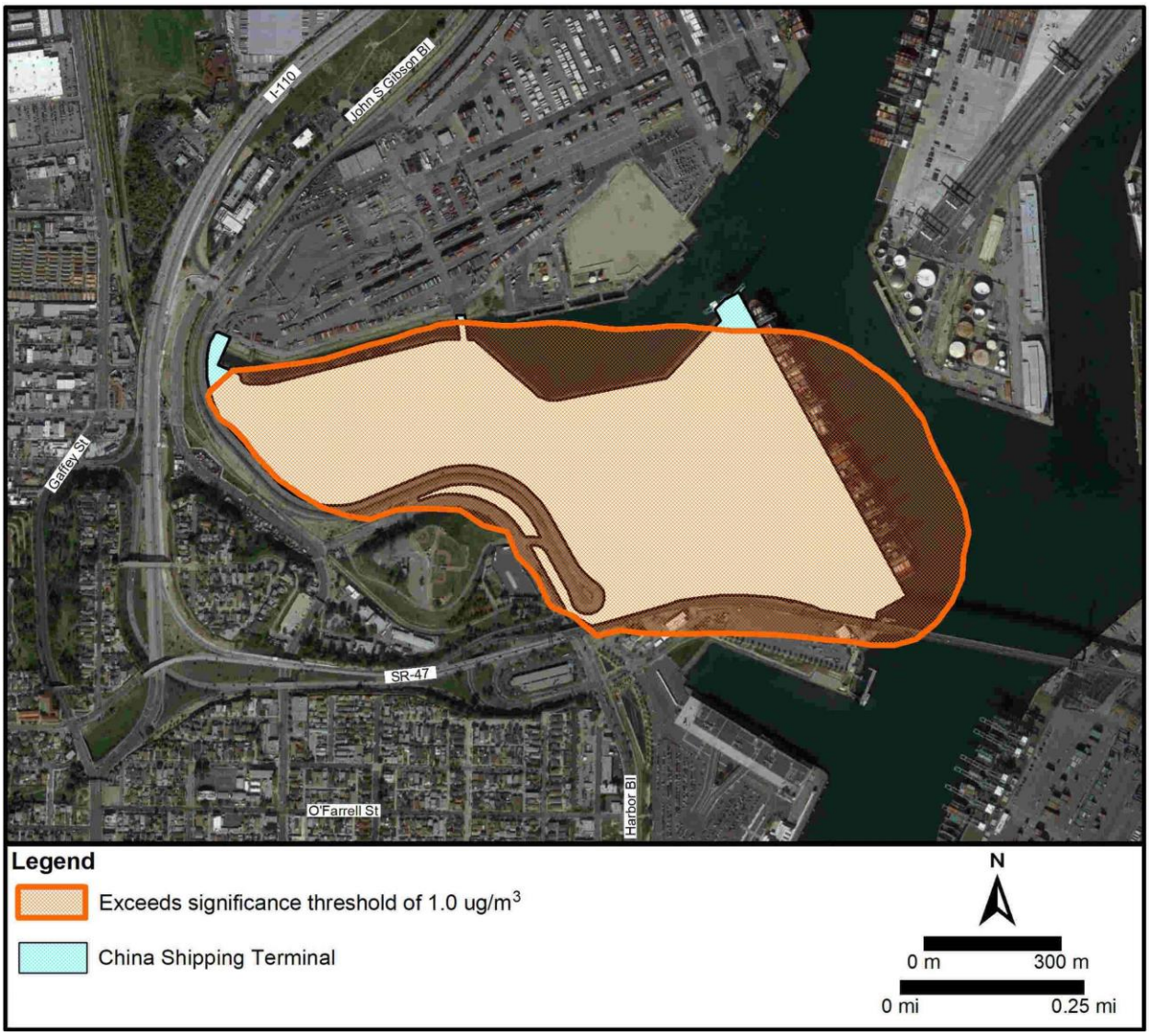


Figure B2-60. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2036 Annual PM_{10} Concentration Increments

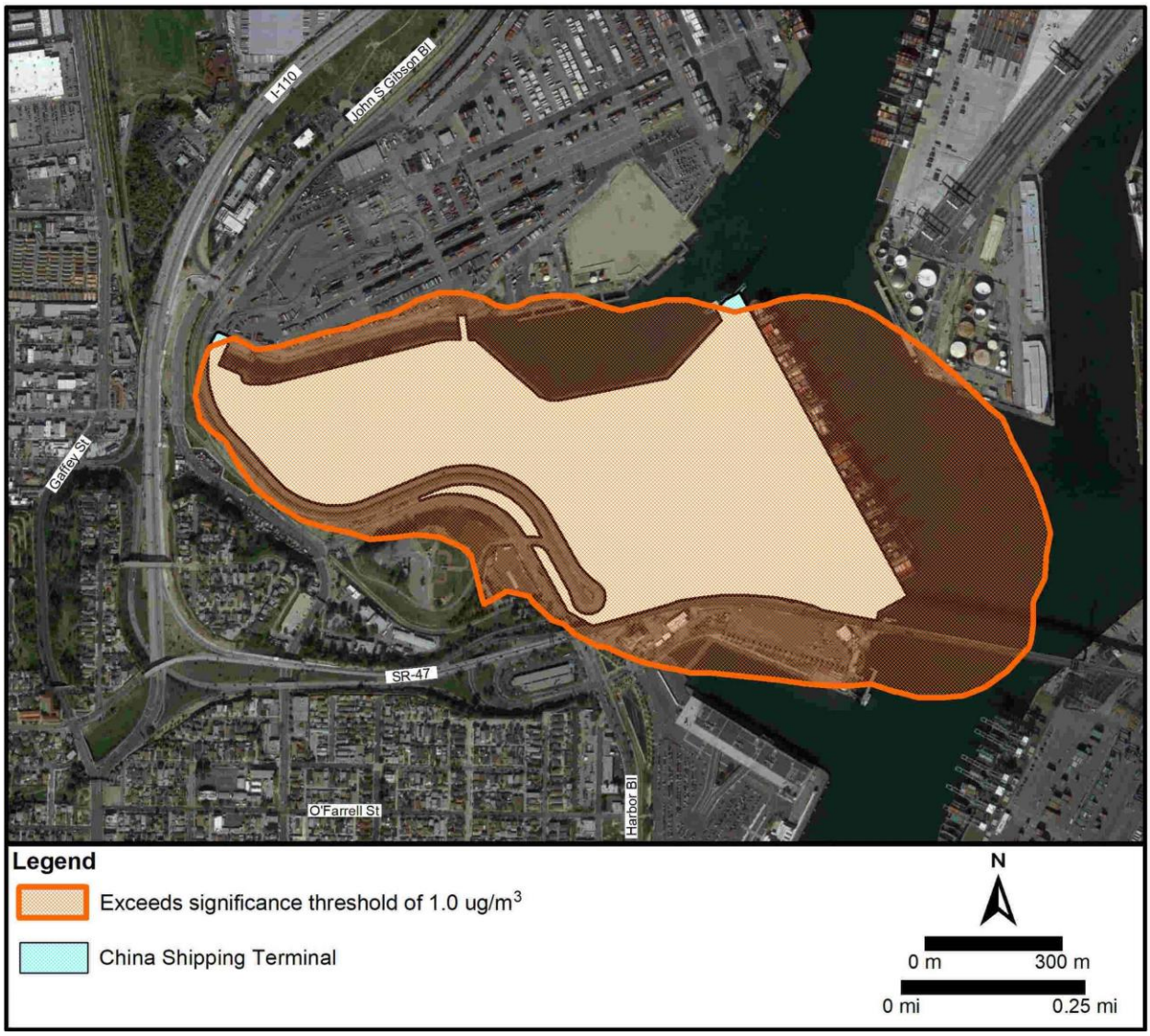
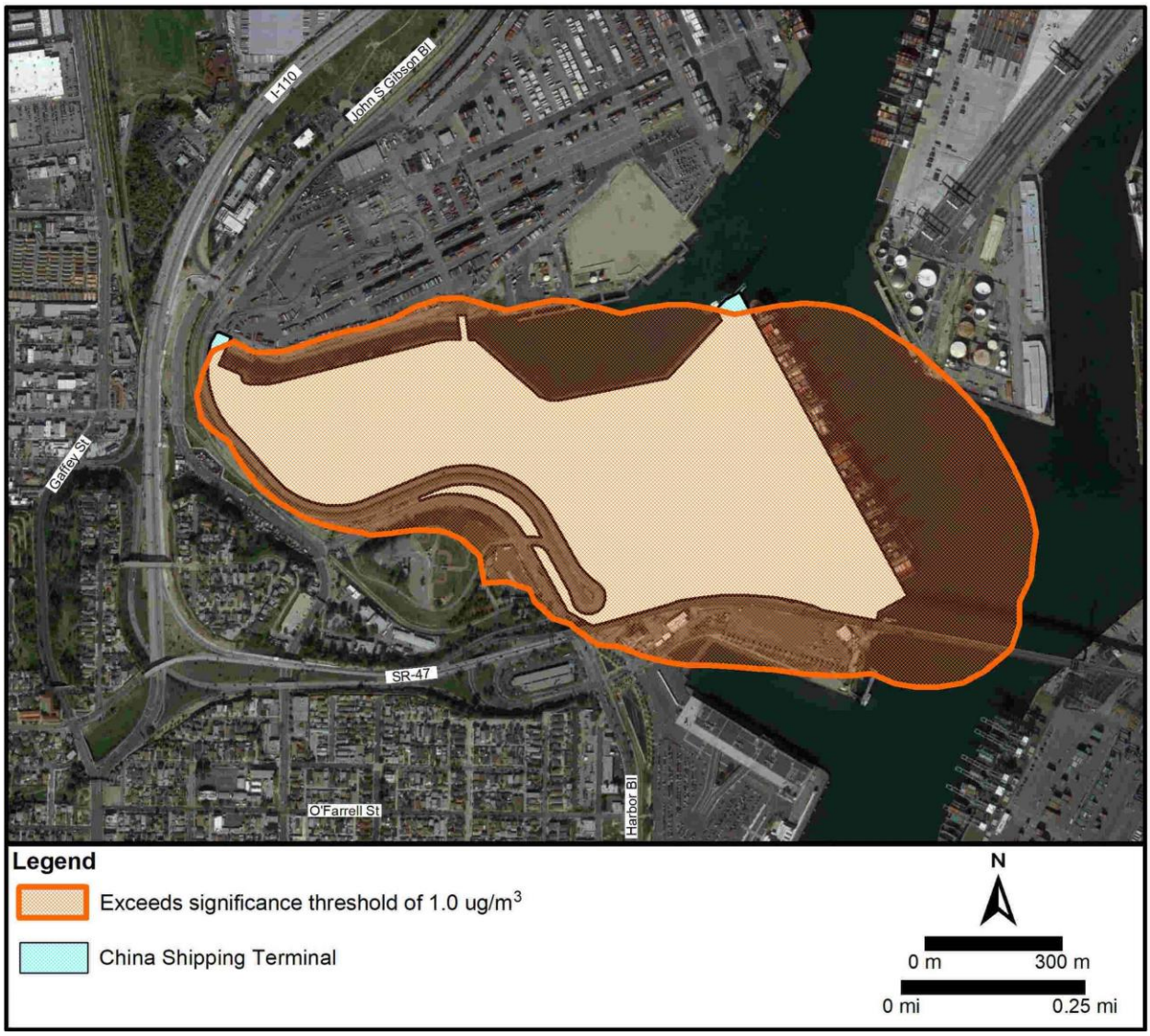


Figure B2-61. Area of Threshold Exceedance for the FEIR Mitigated Scenario; 2045 Annual PM_{10} Concentration Increments



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