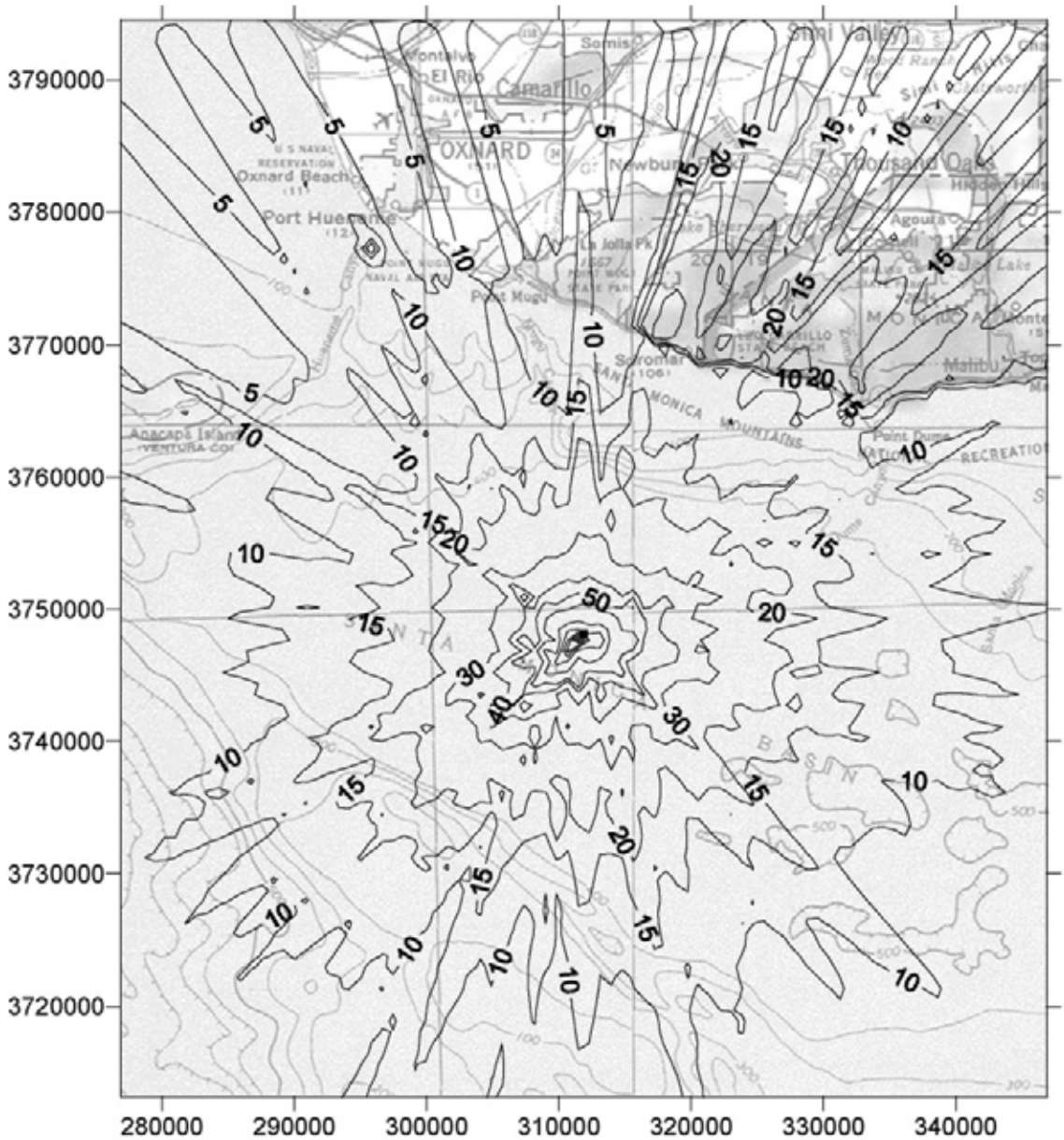
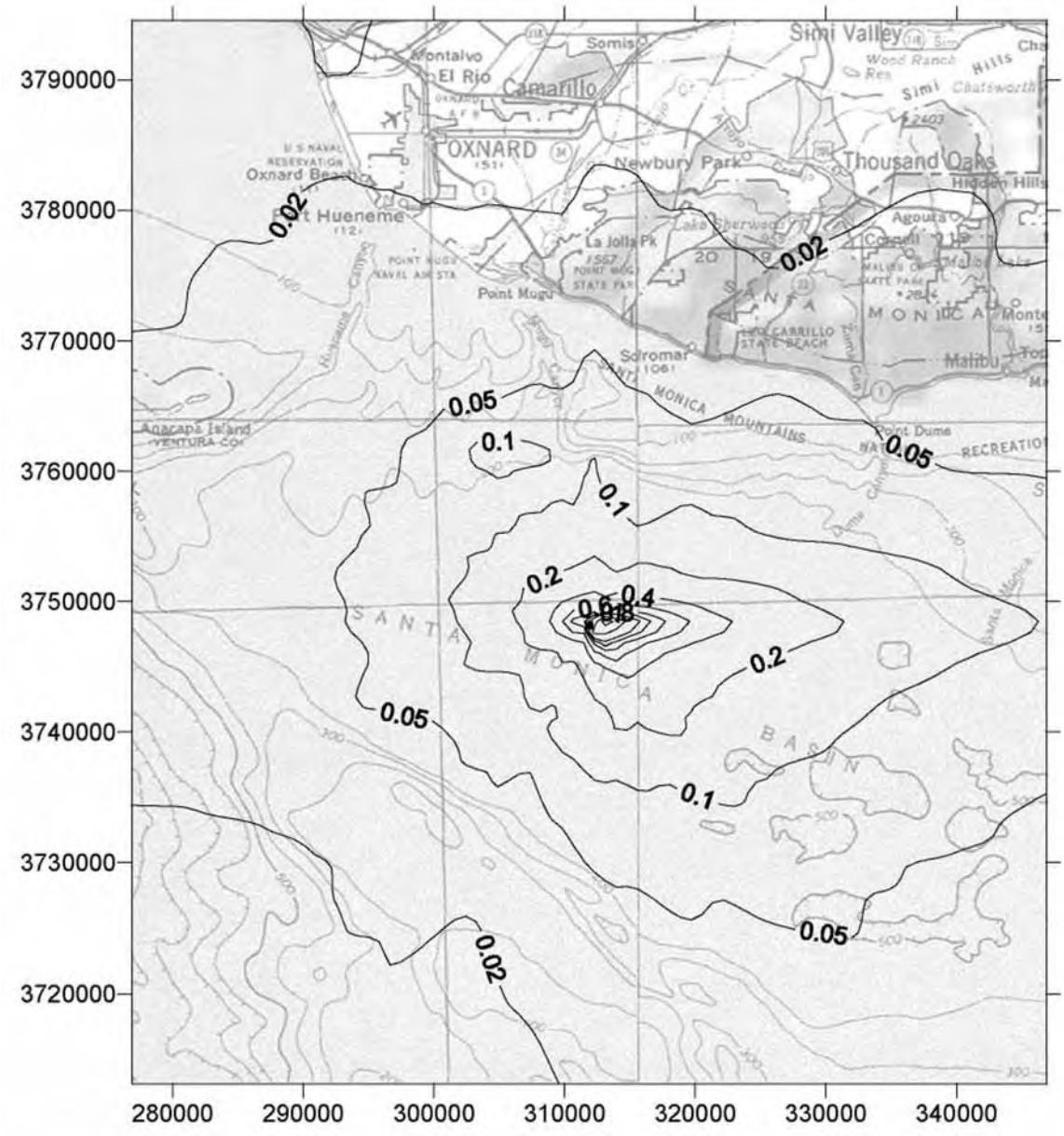
Figure 1-9
BHP Cabrillo LNG Deepwater Port
One-Hour Average NO_2 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts



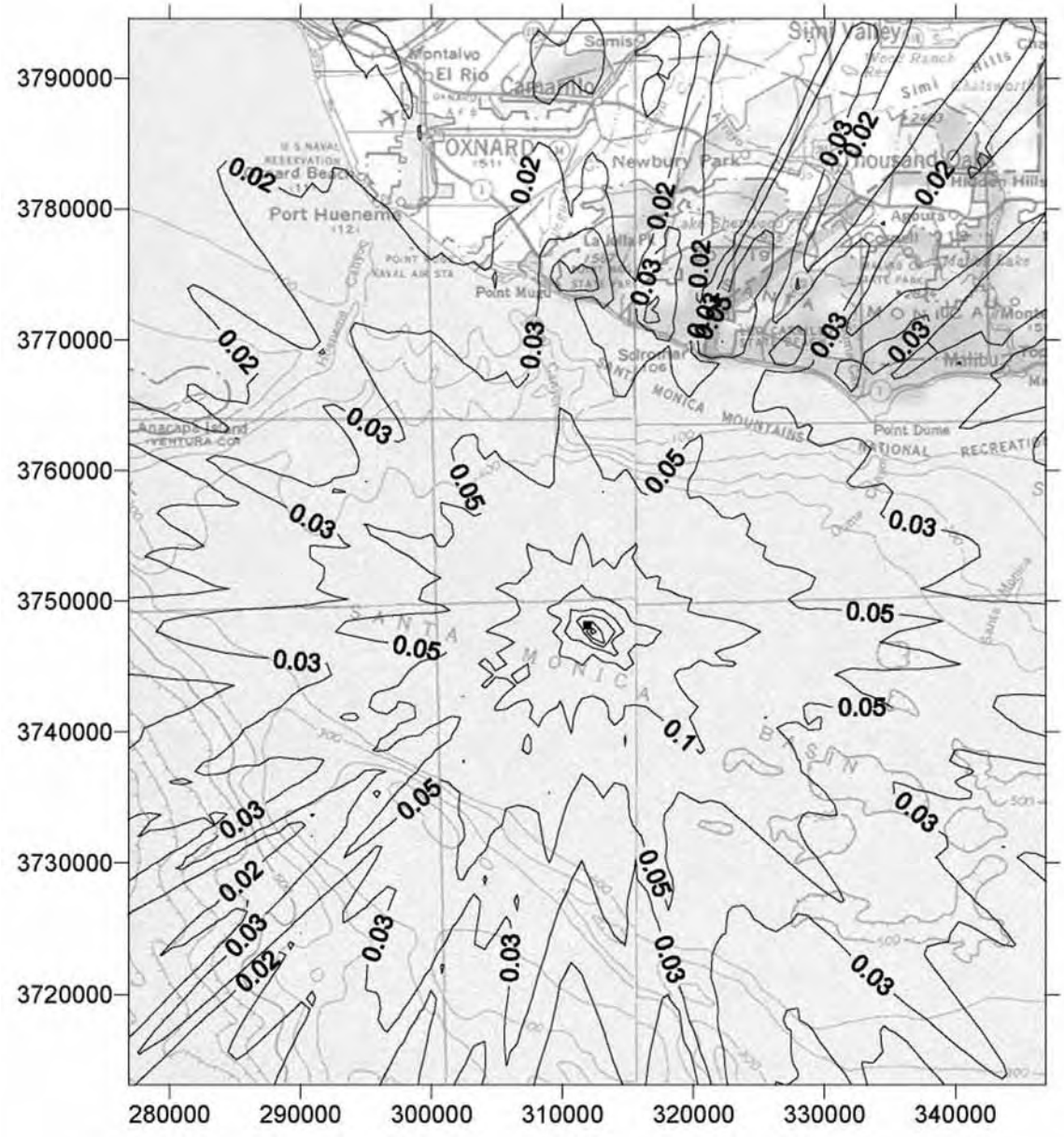
Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-10
BHP Cabrillo LNG Deepwater Port
Annual Average NO_2 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts



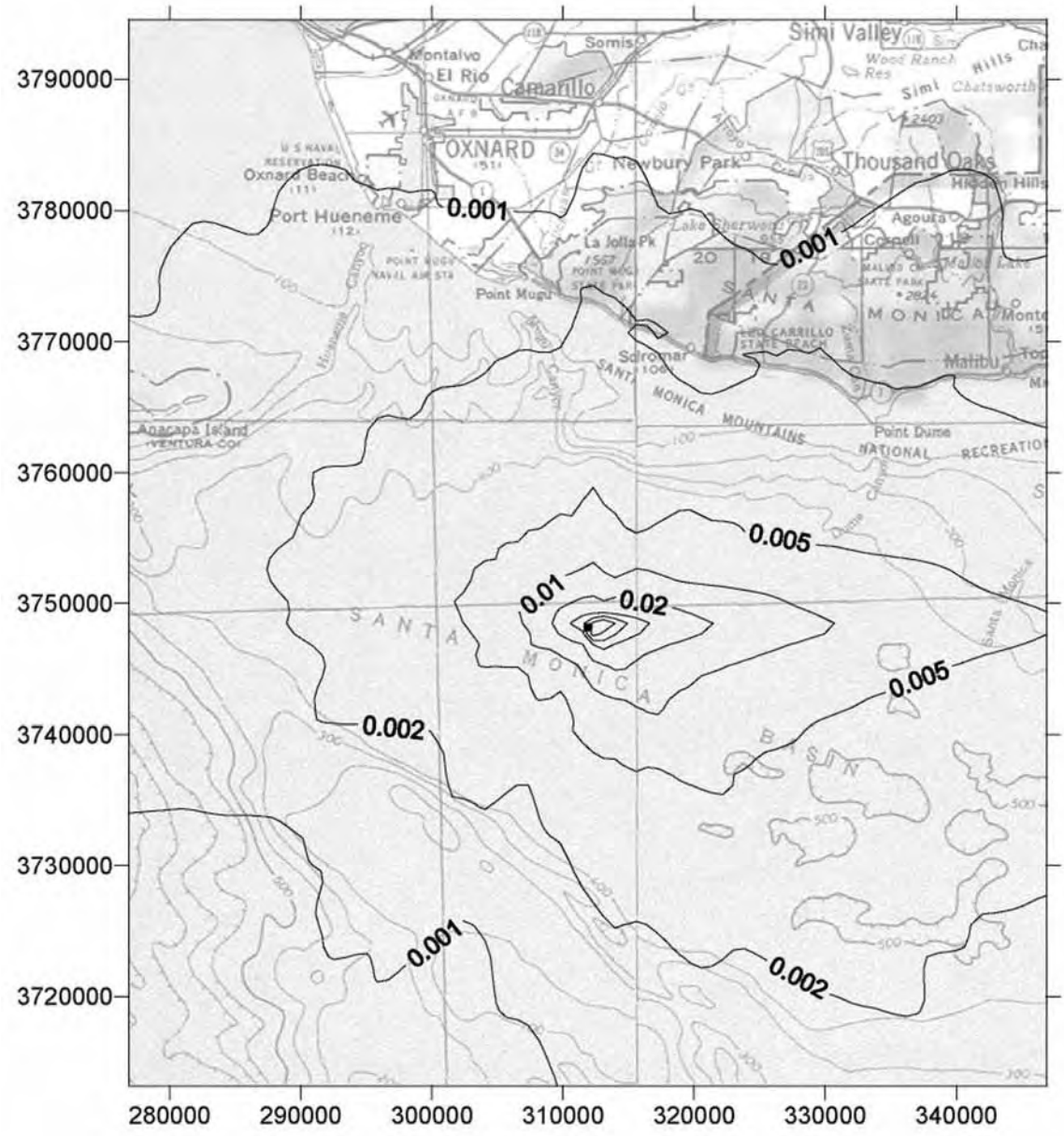
Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-11
BHP Cabrillo LNG Deepwater Port
24-hr Average PM_{10} Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts



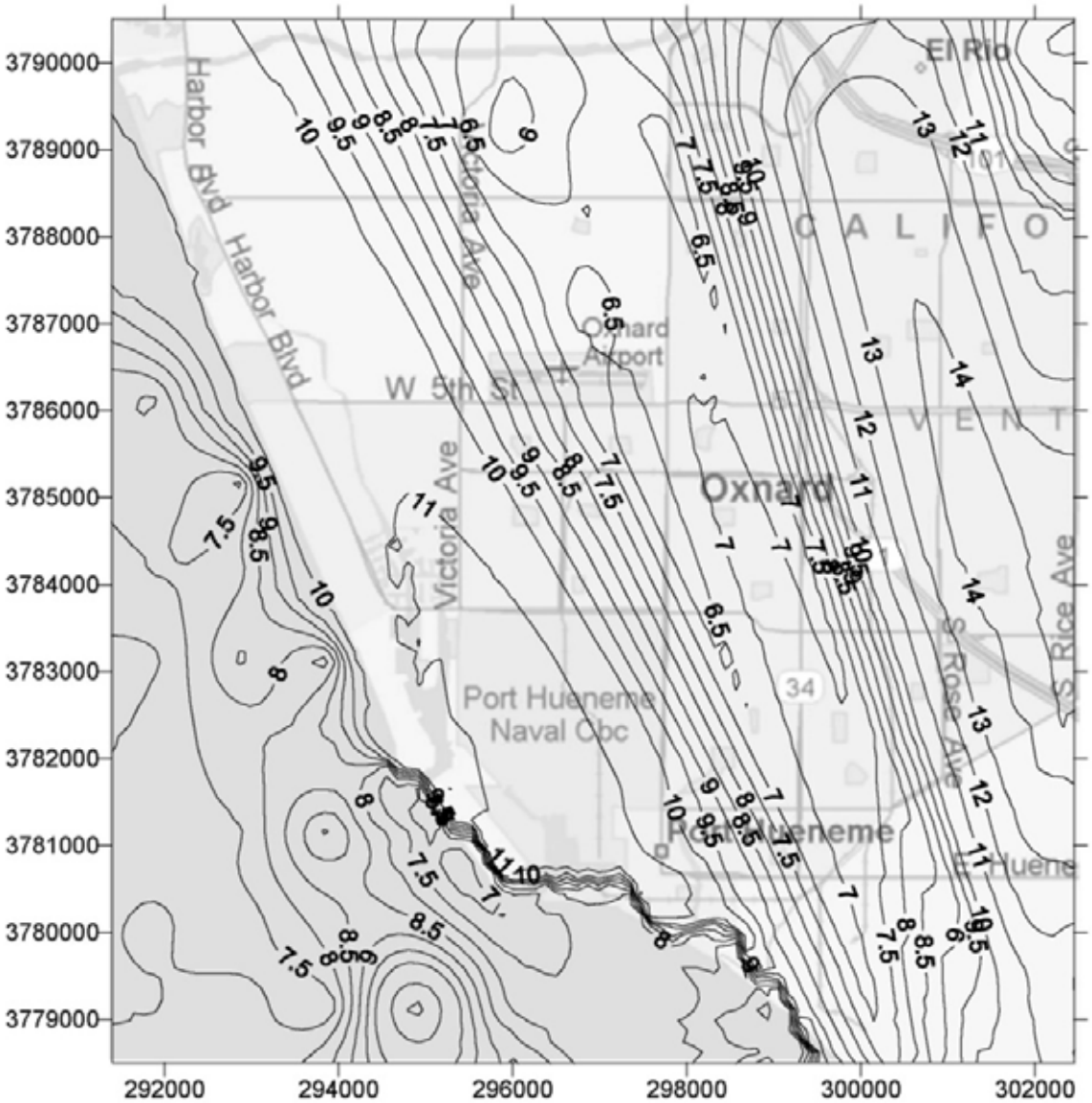
Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-12
BHP Cabrillo LNG Deepwater Port
Annual Average PM_{10} Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts



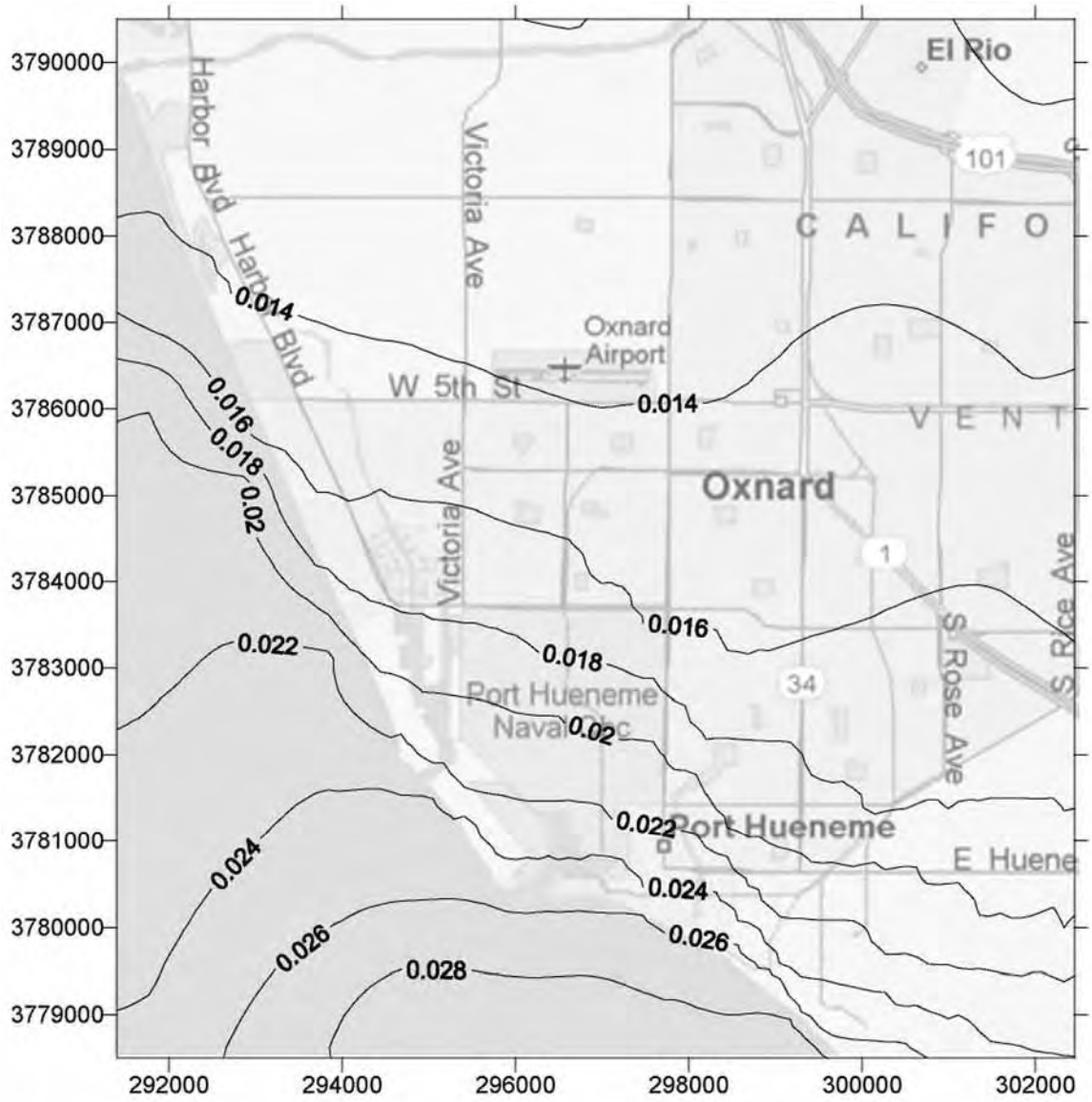
Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-13
BHP Cabrillo LNG Deepwater Port
One-Hour Average NO_2 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts Over Oxnard Area



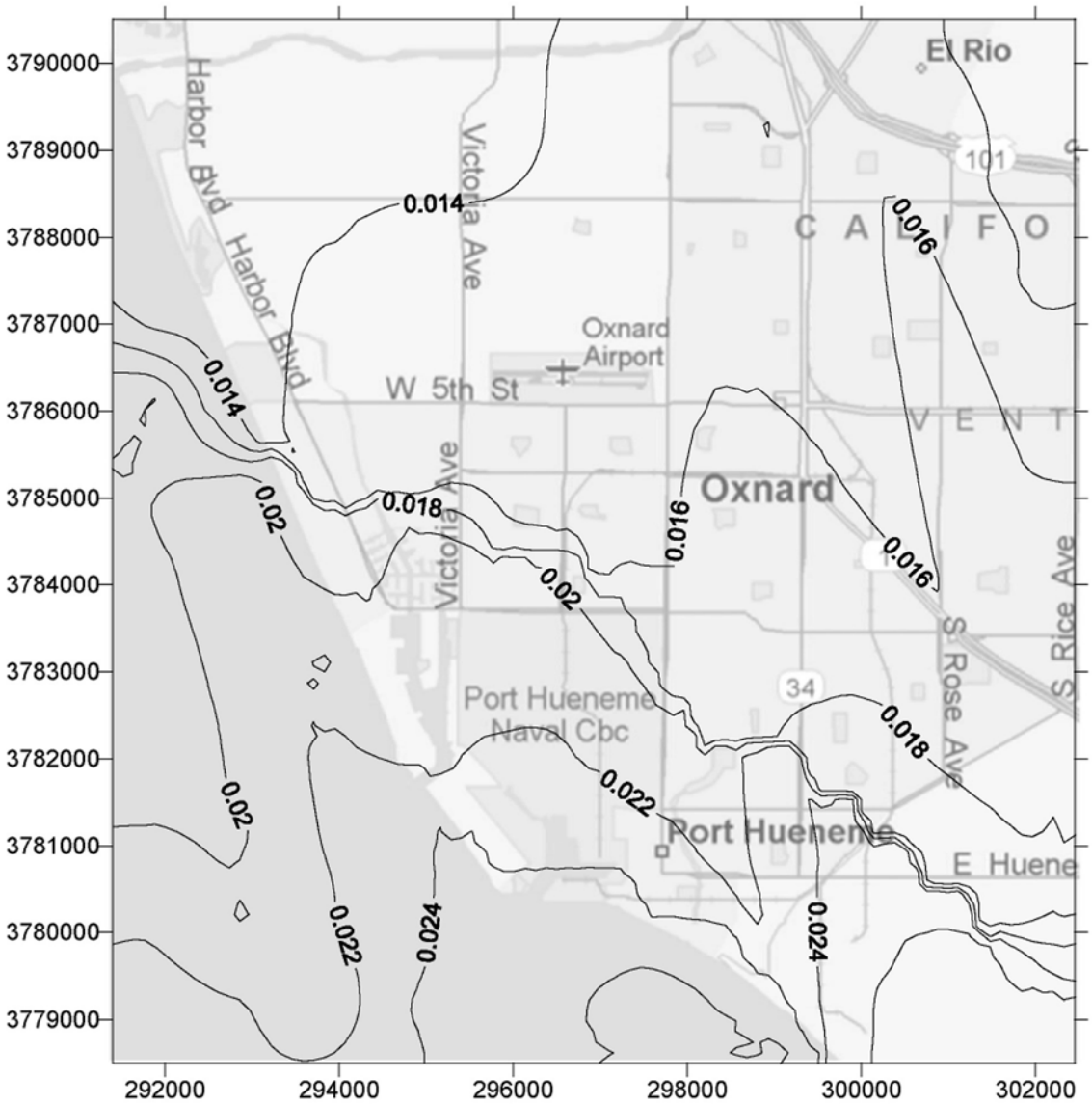
Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-14
BHP Cabrillo LNG Deepwater Port
Annual Average NO_2 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts Over Oxnard Area



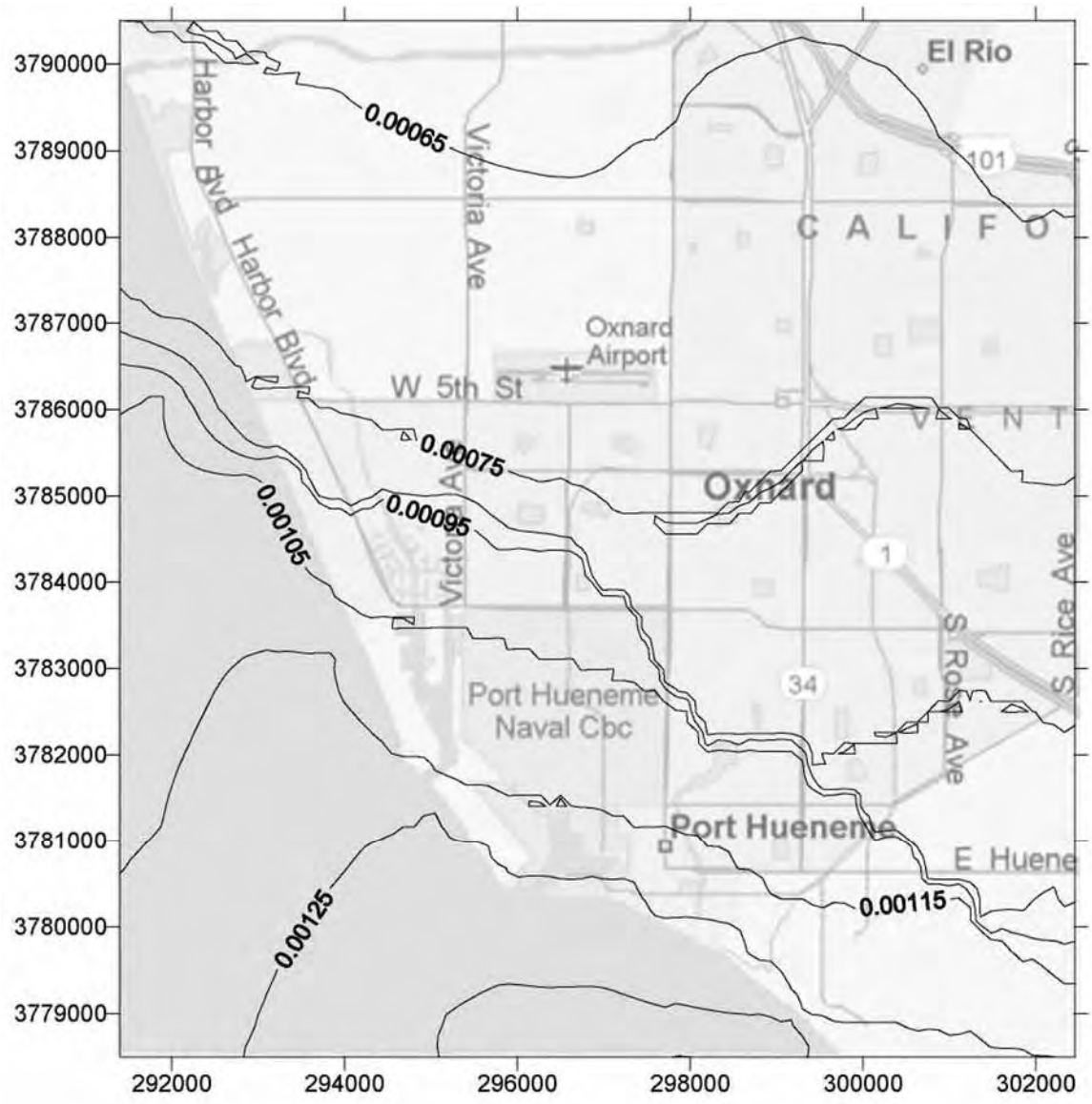
Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-15
BHP Cabrillo LNG Deepwater Port
24-hr Average PM_{10} Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts Over Oxnard Area



Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-16
BHP Cabrillo LNG Deepwater Port
Annual Average PM_{10} Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts Over Oxnard Area



Note: Lines show contours of constant concentration; impacts are in units of $\mu g/m^3$.

Figure 1-17
BHP Cabrillo LNG Deepwater Port
Locations of Receptors Used to Evaluate Project Impacts in the South Coast Air Basin

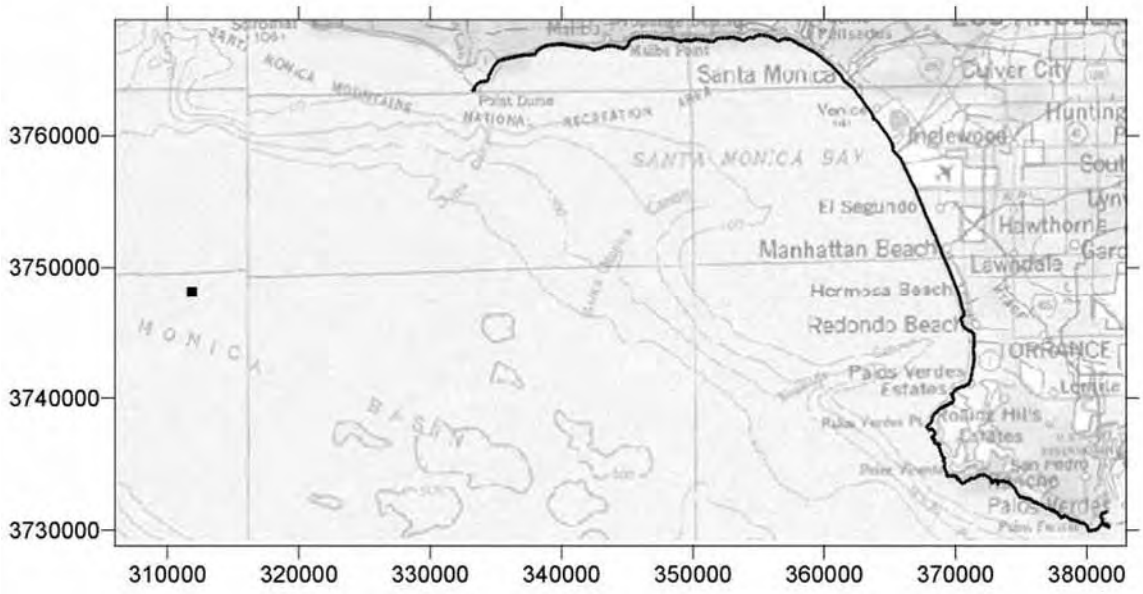


Figure 1-18
BHP Cabrillo LNG Deepwater Port
One-Hour Average NO2 Impacts: FSRU Sources Only
Maximum Modeled Impacts

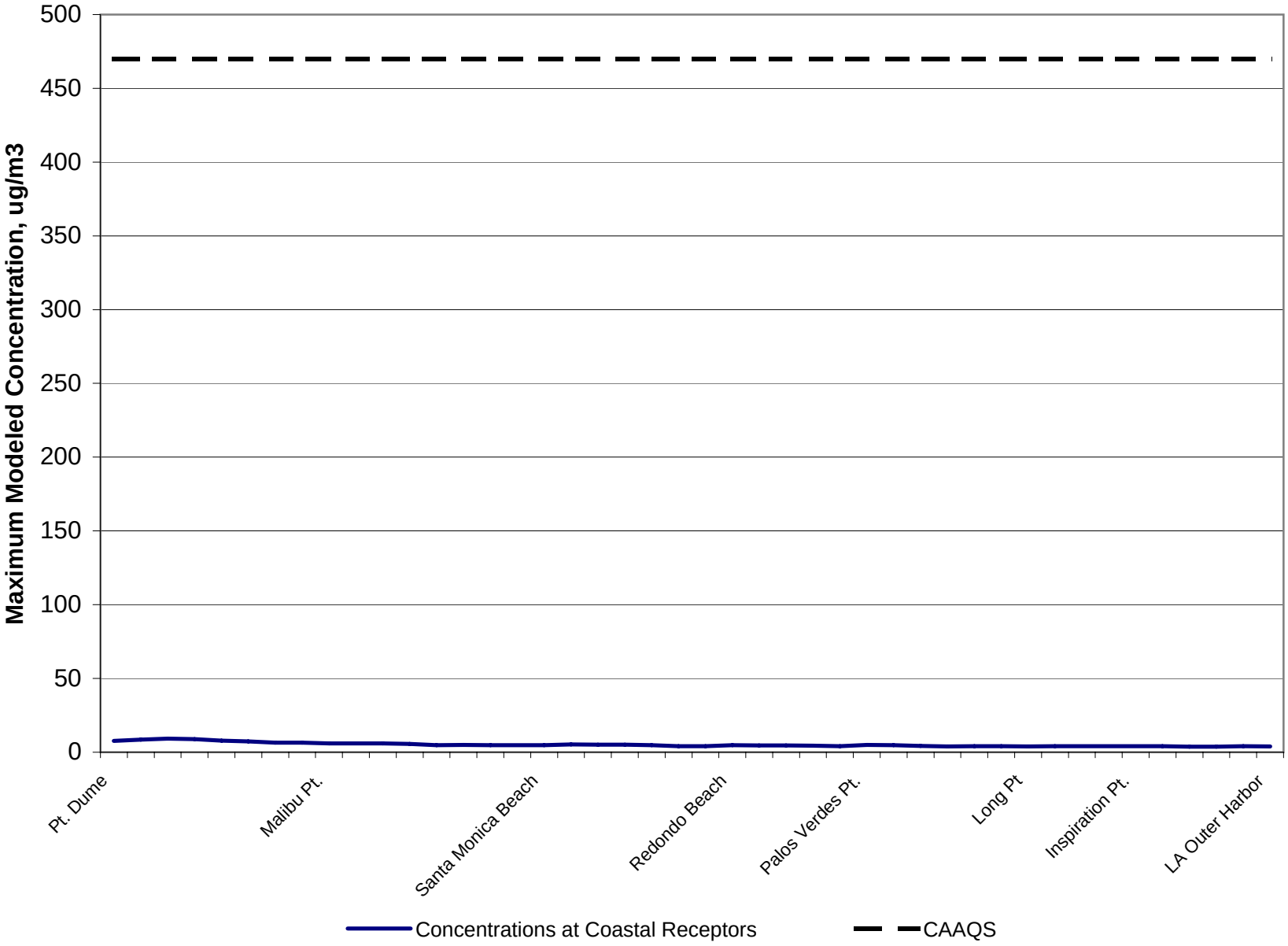


Figure 1-19
BHP Cabrillo LNG Deepwater Port
Annual Average NO2 Impacts: FSRU Sources Only
Maximum Modeled Impacts

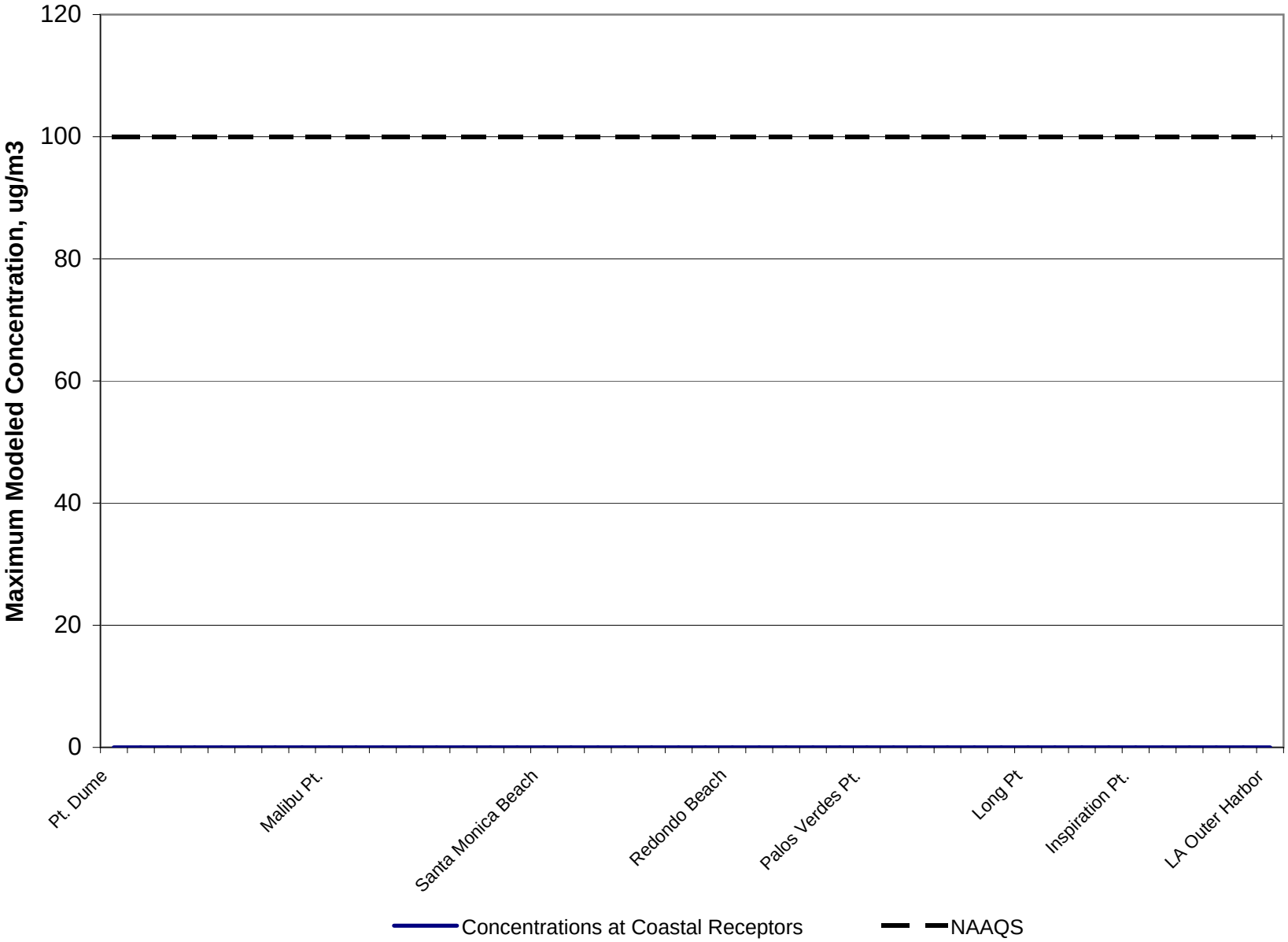


Figure 1-20
BHP Cabrillo LNG Deepwater Port
24-Hour Average PM10/PM2.5 Impacts: FSRU Sources Only
Maximum Modeled Impacts

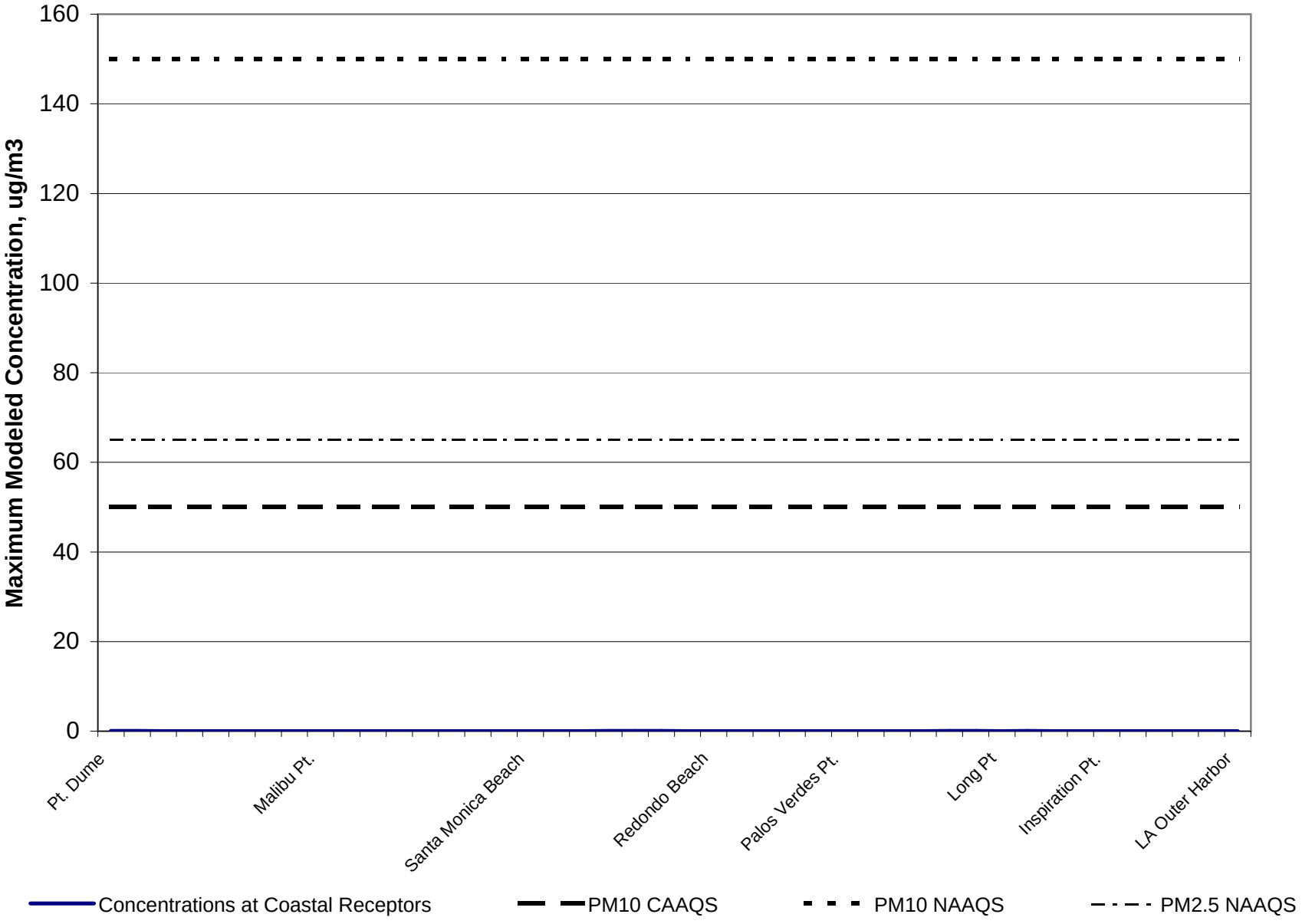


Figure 1-21
BHP Cabrillo LNG Deepwater Port
Annual Average PM10/PM2.5 Impacts: FSRU Sources Only
Maximum Modeled Impacts

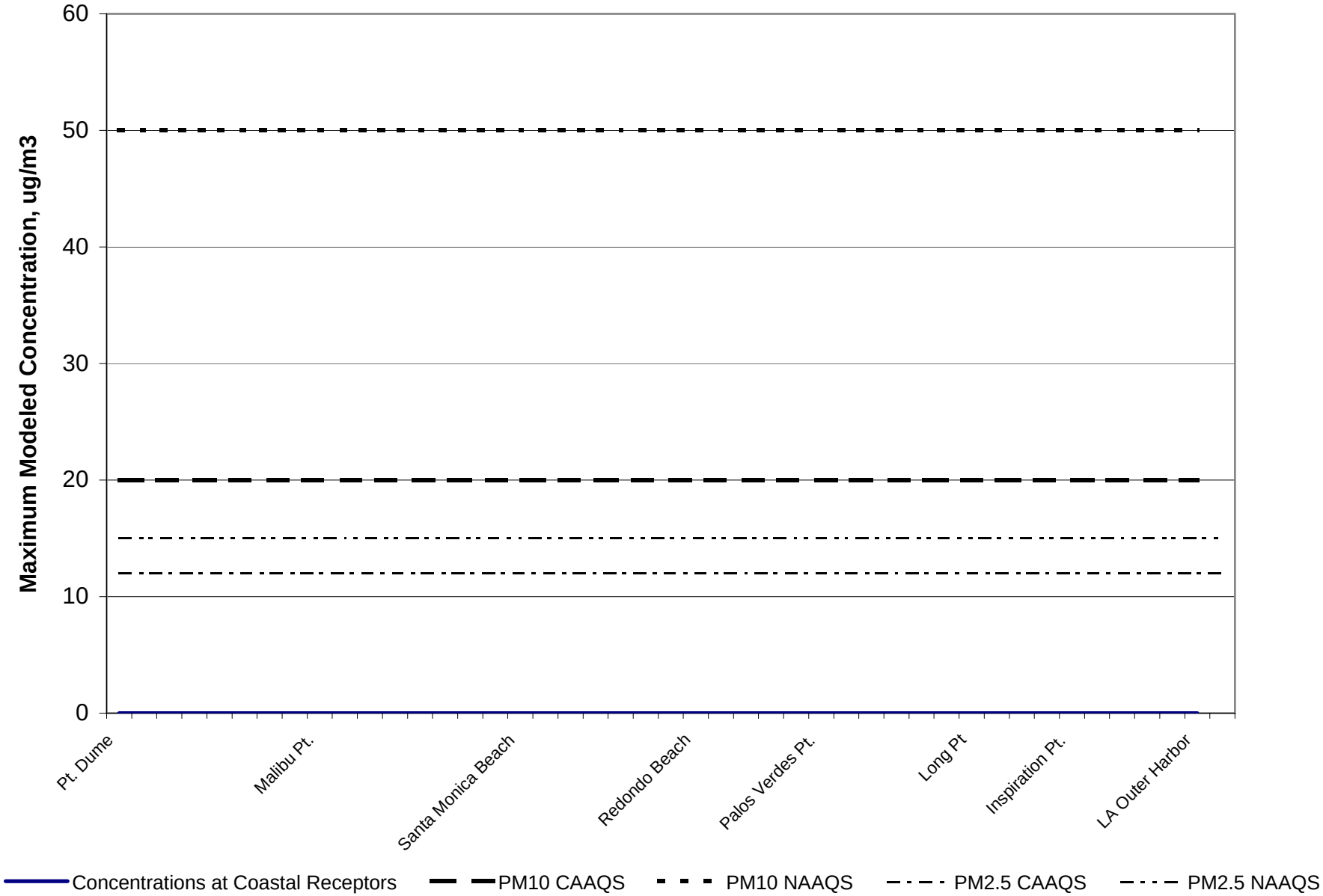


Figure 1-22
BHP Cabrillo LNG Deepwater Port
One-Hour Average NO2 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts

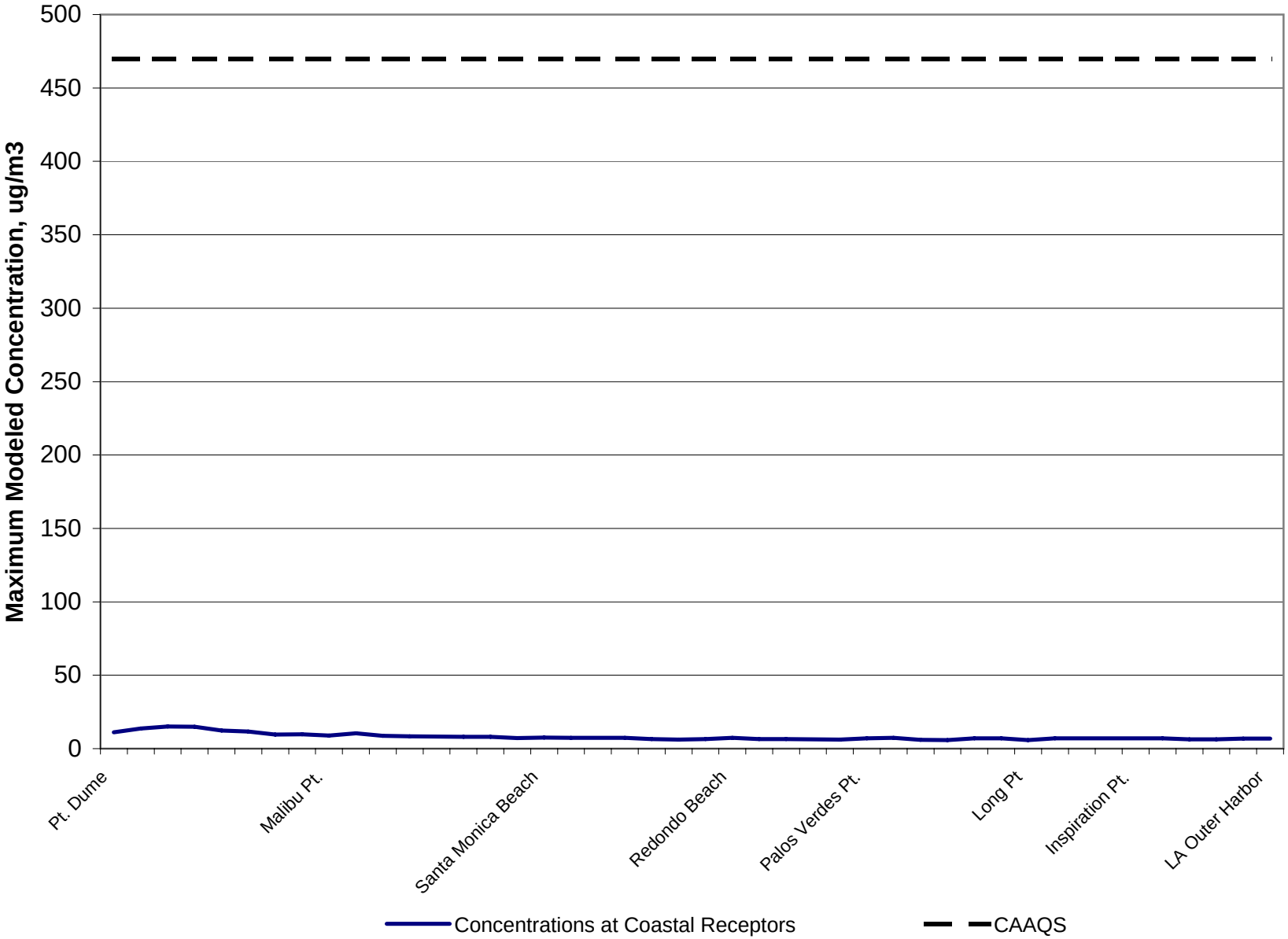


Figure 1-23
BHP Cabrillo LNG Deepwater Port
Annual Average NO2 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts

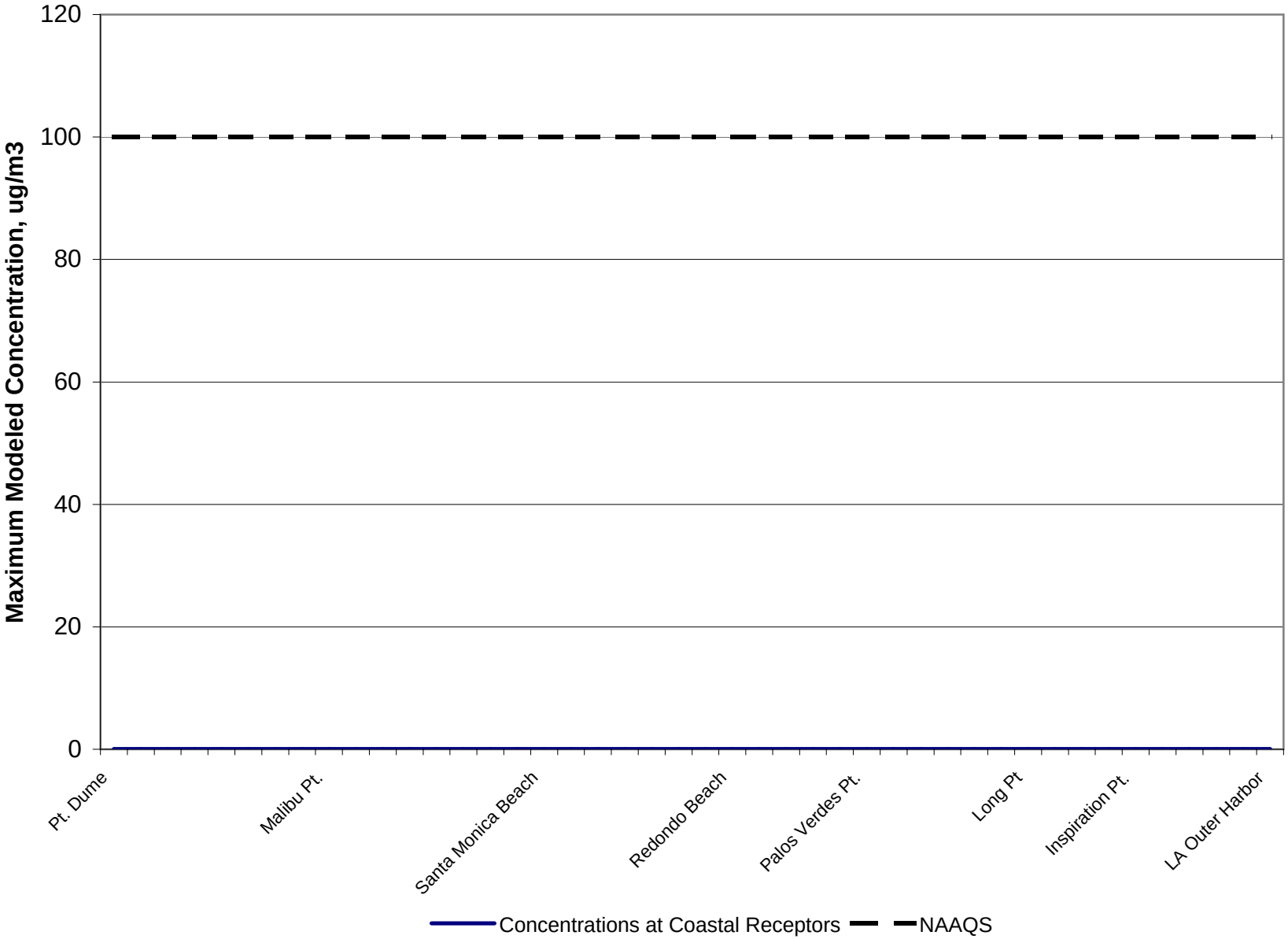


Figure 1-24
BHP Cabrillo LNG Deepwater Port
24-Hour Average PM10/PM2.5 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts

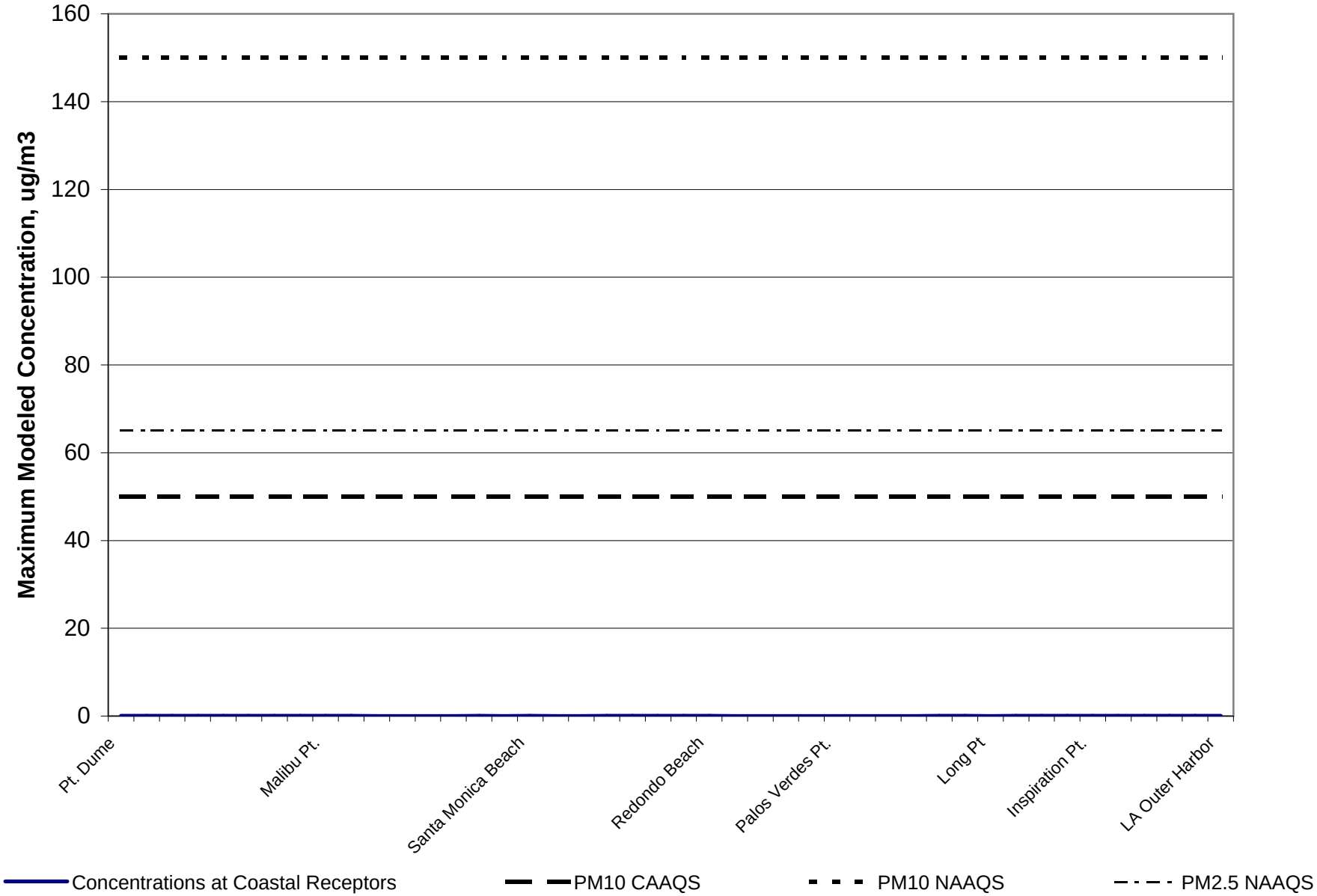
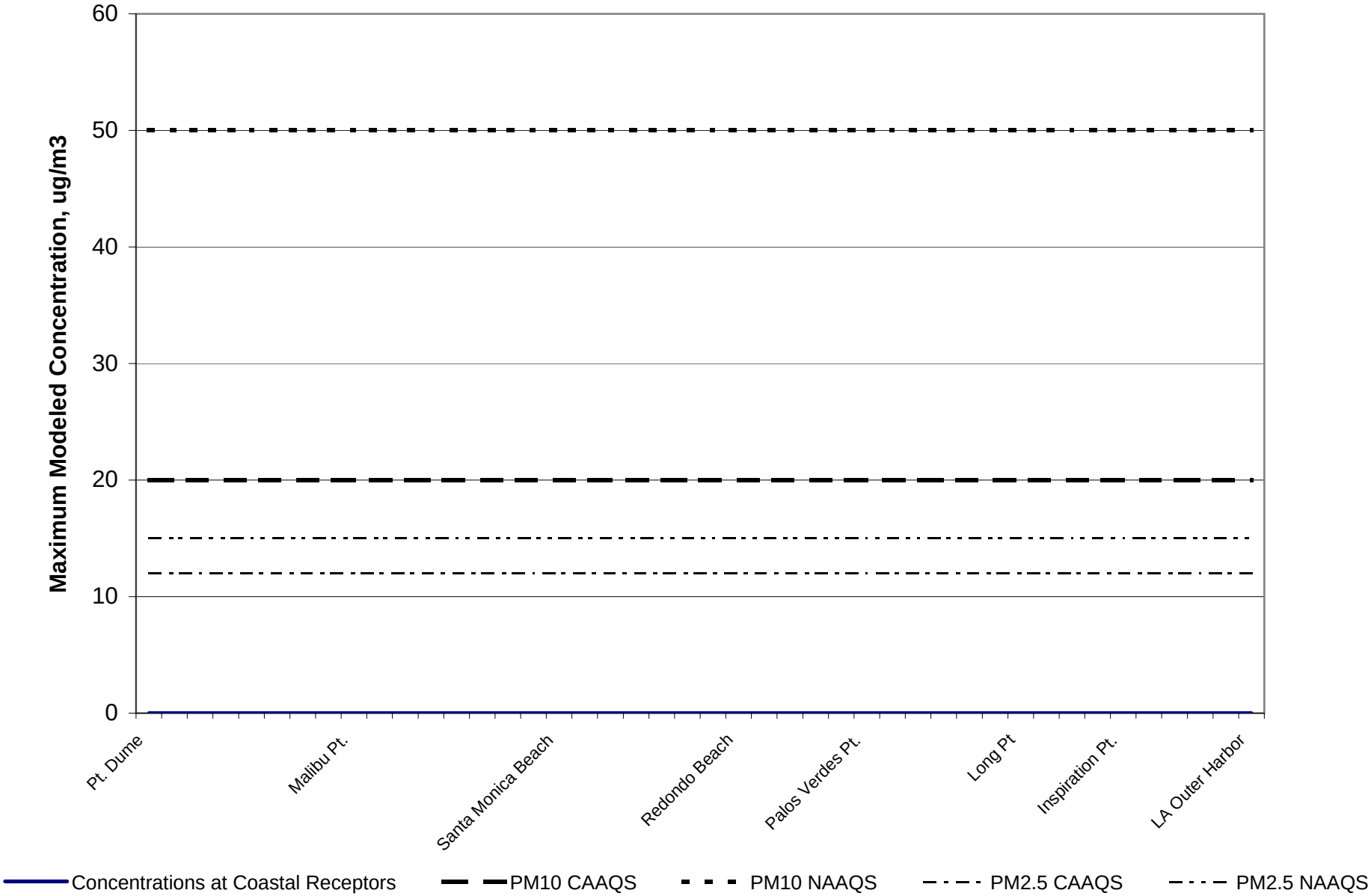


Figure 1-25
BHP Cabrillo LNG Deepwater Port
Annual Average PM10/PM2.5 Impacts: FSRU Sources and Marine Vessels
Maximum Modeled Impacts



APPENDIX 1

EMISSION RATES AND STACK PARAMETERS FOR MODELING

Emission Rates and Stack Parameters for Refined Modeling
BHP Cabrillo LNG Deepwater Port: FSRU Sources

	Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rate, g/s NOx	SO2	CO	PM10
Averaging Period: 1 hour									
Main generators (total)	1.732	33.000	699.67	126.38	53.637	0.749	0.004	1.013	n/a
Vaporizers (total)	2.000	35.000	294.11	44.994	14.322	1.407	0.010	4.284	n/a
Emergency generator	0.660	25.000	699.67	24.591	71.792	6.533	0.007	4.083	n/a
Fire pump	0.254	25.000	699.67	4.015	79.235	0.933	0.001	0.583	n/a
Life boat	0.076	1.000	699.67	0.437	95.864	0.101	0.000	0.078	n/a
Averaging Period: 3 hours									
Main generators (total)	1.732	33.000	699.67	126.38	53.637	n/a	3.965E-03	n/a	n/a
Vaporizers (total)	2.000	35.000	294.11	44.994	14.322	n/a	9.555E-03	n/a	n/a
Emergency generator	0.660	25.000	699.67	24.591	71.792	n/a	2.340E-03	n/a	n/a
Fire pump	0.254	25.000	699.67	4.015	79.235	n/a	3.820E-04	n/a	n/a
Life boat	0.076	1.000	699.67	0.437	95.864	n/a	4.159E-05	n/a	n/a
Averaging Period: 8 hours									
Main generators (total)	1.732	33.000	699.67	126.38	53.637	0.749	n/a	1.013	n/a
Vaporizers (total)	2.000	35.000	294.11	44.994	14.322	1.407	n/a	4.284	n/a
Emergency generator	0.660	25.000	699.67	24.591	71.792	0.817	n/a	0.510	n/a
Fire pump	0.254	25.000	699.67	4.015	79.235	0.117	n/a	0.073	n/a
Life boat	0.076	1.000	699.67	0.437	95.864	0.013	n/a	0.010	n/a
Averaging Period: 24 hours									
Main generators (total)	1.732	33.000	699.67	126.38	53.637	n/a	3.965E-03	n/a	0.435
Vaporizers (total)	2.000	35.000	294.11	44.994	14.322	n/a	9.555E-03	n/a	0.109
Emergency generator	0.660	25.000	699.67	24.591	71.792	n/a	2.924E-04	n/a	0.010
Fire pump	0.254	25.000	699.67	4.015	79.235	n/a	4.775E-05	n/a	1.389E-03
Life boat	0.076	1.000	699.67	0.437	95.864	n/a	5.199E-06	n/a	2.593E-04
Averaging Period: Annual									
Main generators (total)	1.732	33.000	699.67	126.38	53.637	0.383	2.028E-03	n/a	0.222
Vaporizers (total)	2.000	35.000	294.11	44.994	14.322	1.407	9.555E-03	n/a	0.109
Emergency generator	0.660	25.000	699.67	24.591	71.792	0.075	8.012E-05	n/a	2.664E-03
Fire pump	0.254	25.000	699.67	4.015	79.235	0.011	1.308E-05	n/a	3.805E-04
Life boat	0.076	1.000	699.67	0.437	95.864	2.886E-07	3.561E-10	n/a	3.552E-05

Emission Rates and Stack Parameters for Refined Modeling
BHP Cabrillo LNG Deepwater Port: Vessels in District and Federal Waters

	Effective Stack Diam, m	Stack Height, m	Exh Temp, Deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rate, g/s NOx	SO2	CO	PM10
Averaging Period: 1 hour									
Assist Tugs DW	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
Crew Boat DW	0.330	5.000	699.67	2.30	26.917	0.303	5.896E-05	0.199	n/a
Assist Tugs FW1	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
Crew Boat FW1	0.330	5.000	699.67	2.30	26.917	n/a	n/a	n/a	n/a
Assist Tugs FW2	0.777	9.059	699.67	14.71	31.009	2.631	5.460E-04	1.730	n/a
LNG Carrier FW2	0.800	44.000	699.67	27.90	55.512	4.191	8.698E-04	2.756	n/a
Crew Boat FW2	0.330	5.000	699.67	2.30	26.917	n/a	n/a	n/a	n/a
Assist Tugs FW3	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
LNG Carrier FW3	0.800	44.000	699.67	27.90	55.512	n/a	n/a	n/a	n/a
Averaging Period: 3 hours									
Assist Tugs DW	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
Crew Boat DW	0.330	5.000	699.67	2.30	26.917	n/a	1.965E-05	n/a	n/a
Assist Tugs FW1	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
Crew Boat FW1	0.330	5.000	699.67	2.30	26.917	n/a	7.181E-05	n/a	n/a
Assist Tugs FW2	0.777	9.059	699.67	14.71	31.009	n/a	5.460E-04	n/a	n/a
LNG Carrier FW2	0.800	44.000	699.67	27.90	55.512	n/a	8.698E-04	n/a	n/a
Crew Boat FW2	0.330	5.000	699.67	2.30	26.917	n/a	2.494E-05	n/a	n/a
Assist Tugs FW3	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
LNG Carrier FW3	0.800	44.000	699.67	27.90	55.512	n/a	n/a	n/a	n/a
Averaging Period: 8 hours									
Assist Tugs DW	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
Crew Boat DW	0.330	5.000	699.67	2.30	26.917	7.567E-02	n/a	4.976E-02	n/a
Assist Tugs FW1	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
Crew Boat FW1	0.330	5.000	699.67	2.30	26.917	0.138	n/a	9.091E-02	n/a
Assist Tugs FW2	0.777	9.059	699.67	14.71	31.009	2.631	n/a	1.730	n/a
LNG Carrier FW2	0.800	44.000	699.67	27.90	55.512	4.191	n/a	2.756	n/a
Crew Boat FW2	0.330	5.000	699.67	2.30	26.917	9.604E-02	n/a	6.316E-02	n/a
Assist Tugs FW3	0.777	9.059	699.67	14.71	31.009	n/a	n/a	n/a	n/a
LNG Carrier FW3	0.800	44.000	699.67	27.90	55.512	n/a	n/a	n/a	n/a
Averaging Period: 24 hours									
Assist Tugs DW	0.777	9.059	699.67	14.71	31.009	n/a	2.882E-05	n/a	1.747E-03
Crew Boat DW	0.330	5.000	699.67	2.30	26.917	n/a	4.913E-06	n/a	2.978E-04
Assist Tugs FW1	0.777	9.059	699.67	14.71	31.009	n/a	1.248E-04	n/a	7.629E-03
Crew Boat FW1	0.330	5.000	699.67	2.30	26.917	n/a	1.795E-05	n/a	1.088E-03
Assist Tugs FW2	0.777	9.059	699.67	14.71	31.009	n/a	5.114E-04	n/a	3.126E-02
LNG Carrier FW2	0.800	44.000	699.67	27.90	55.512	n/a	7.719E-04	n/a	4.718E-02
Crew Boat FW2	0.330	5.000	699.67	2.30	26.917	n/a	6.236E-06	n/a	3.779E-04
Assist Tugs FW3	0.777	9.059	699.67	14.71	31.009	n/a	1.392E-04	n/a	8.510E-03
LNG Carrier FW3	0.800	44.000	699.67	27.90	55.512	n/a	3.816E-04	n/a	2.332E-02
Averaging Period: Annual									
Assist Tugs DW	0.777	9.059	699.67	14.71	31.009	2.108E-02	4.106E-06	n/a	2.488E-04
Crew Boat DW	0.330	5.000	699.67	2.30	26.917	1.189E-02	2.315E-06	n/a	1.403E-04
Assist Tugs FW1	0.777	9.059	699.67	14.71	31.009	0.171	3.557E-05	n/a	2.174E-03
Crew Boat FW1	0.330	5.000	699.67	2.30	26.917	5.466E-02	8.952E-06	n/a	5.425E-04
Assist Tugs FW2	0.777	9.059	699.67	14.71	31.009	2.368	4.890E-04	n/a	2.992E-02
LNG Carrier FW2	0.800	44.000	699.67	27.90	55.512	1.338	2.749E-04	n/a	1.697E-02
Crew Boat FW2	0.330	5.000	699.67	2.30	26.917	7.192E-03	3.110E-06	n/a	1.885E-04
Assist Tugs FW3	0.777	9.059	699.67	14.71	31.009	0.100	2.877E-05	n/a	1.151E-03
LNG Carrier FW3	0.800	44.000	699.67	27.90	55.512	0.653	1.355E-04	n/a	8.283E-03

LNG Carrier stack height includes hull height, which is 21 meters above water line.
FW1 represents activity between District Water Boundary and FSRU
FW2 represents activity within safety zone and at FSRU
FW3 represents activity between Safety Zone and Federal Waters Boundary