APPENDIX 8.1D

Modeling Analysis

Table 8.1D-1

Dimensions of On-Site Structures

SBRP

Feature	Height (feet)	Length (feet)	Width (feet)	Diameter (feet)
Combustion turbines & generators (base unit)	39.0	291	32.5	--
HRSGs	94.0	132.3	38.8	--
CTG stacks	125.0	--	--	19.0
CT Inlet Air Filters	70.0	48.0	24.7	
Steam Turbine	82.0	96.0	37.3	--
CTG Stepup Transformers	20.0	48.7	30.7	
Fuel Meter	10.0	48.7	30.7	
Fuel Compressor	22.0	98.8	55.9	
Heat Exchanger	20.0	90.0	61.6	
Air-Cooled Condensers	89.0	403.1	159.6	
Water Treatment Bldg	20.0	105.4	48.8	--
Administration Bldg	20.0	76.8	68.3	--
Warehouse (Tier 1)	20.0	131.8	74.8	
Warehouse (Tier 2)	32.0	74.8	66.1	
CT Generation Building	40.0	48.3	31.8	
Fire Pump	16.0	30.7	25.6	--
Auxiliary Boiler	24.0	22.0	20.9	--
Ammonia Storage Tanks	15.0	45.5	35.1	--
Tanks				
Demineralized Water Tank	30.0	--	--	29.0
Raw Water Tanks	28.0	--	--	41.0
Waste Tank	28.0	--	--	41.0

Table 8.1D-2

Screening Modeling Inputs

Data For Each Turbine

Case	Amb Temp deg F	Stack height feet	Stack Height meters	Stack Diam feet	Stack Diam meters	Stack flow wacfm	Stack flow m^3/sec	Stack Vel ft/sec	Stack Vel m/sec	Stack Temp deg F	Stack Temp deg K
1. Annual Avg w/ DB	62	125.0	38.10	19.0	5.79	984,890	464.88	57.89	17.65	161.0	344.82
2. Extreme Cold w/ DB	27	125.0	38.10	19.0	5.79	1,054,243	497.61	61.97	18.89	163.0	345.93
3. Extreme Hot Base	108	125.0	38.10	19.0	5.79	910,600	429.81	53.53	16.32	190.0	360.93
4. Annual Avg Base	62	125.0	38.10	19.0	5.79	1,012,396	477.86	59.51	18.14	186.0	358.71
5. Extreme Cold Base	27	125.0	38.10	19.0	5.79	1,083,216	511.29	63.67	19.41	188.0	359.82
6. Extreme Hot Low	108	125.0	38.10	19.0	5.79	635,107	299.78	37.33	11.38	178.0	354.26
7. Annual Avg Low	62	125.0	38.10	19.0	5.79	660,794	311.90	38.84	11.84	169.0	349.26
8. Extreme Cold Low	27	125.0	38.10	19.0	5.79	681,729	321.78	40.07	12.21	170.0	349.82

	NOx lb/hr	CO lb/hr	PM10 lb/hr	SOx lb/hr	VOC lb/hr	NOx g/sec	CO g/sec	PM10 g/sec	SOx g/sec	VOC g/sec	
1. Annual Avg w/ DB	16.89	20.57	10.28	4.91	5.89	2.129	2.592	1.296	0.619	0.742	
2. Extreme Cold w/ DB	17.77	21.64	10.28	5.17	6.20	2.239	2.727	1.296	0.651	0.781	
3. Extreme Hot Base	11.18	13.61	7.75	3.25	3.90	1.409	1.715	0.977	0.410	0.491	
4. Annual Avg Base	12.73	15.51	7.75	3.70	4.44	1.605	1.954	0.977	0.467	0.560	
5. Extreme Cold Base	13.61	16.58	7.75	3.96	4.75	1.715	2.089	0.977	0.499	0.598	
6. Extreme Hot Low	7.40	9.01	7.75	2.15	2.58	0.932	1.135	0.977	0.271	0.325	
7. Annual Avg Low	8.29	10.10	7.75	2.41	2.89	1.045	1.272	0.977	0.304	0.364	
8. Extreme Cold Low	8.78	10.69	7.75	2.55	3.06	1.106	1.347	0.977	0.322	0.386	

Table 8.1D-3
Screening Level Modeling Impacts
(Combined Impacts for Two Gas Turbines)

	Conc. (ug/m^3)									
Operating Mode	**NO_2 1-hr**	**CO 1-hr**	**SO_2 1-hr**	**SO_2 3-hr**	**CO 8-hr**	**PM10 24-hr**	**SO_2 24-hr**	**NO_2 Annual**	**PM10 Annual**	**SO_2 Annual**
1. Annual Avg w/ DB	22.690	27.630	6.598	**4.132**	**11.118**	2.016	**0.963**	**0.515**	0.314	**0.150**
2. Extreme Cold w/ DB	**22.828**	**27.798**	**6.638**	3.873	10.351	1.793	0.901	0.481	0.279	0.140
3. Extreme Hot Base	15.697	19.114	4.564	2.835	7.620	1.579	0.662	0.321	0.223	0.093
4. Annual Avg Base	16.498	20.089	4.797	2.798	7.425	1.344	0.642	0.319	0.194	0.093
5. Extreme Cold Base	16.486	20.075	4.794	2.655	7.051	1.197	0.611	0.305	0.174	0.089
6. Extreme Hot Low	14.461	17.609	4.205	2.985	8.232	**2.589**	0.719	0.397	0.416	0.115
7. Annual Avg Low	16.061	19.557	4.670	3.307	9.152	2.567	0.799	0.447	**0.418**	0.130
8. Extreme Cold Low	16.559	20.163	4.815	3.402	9.375	2.482	0.818	0.448	0.395	0.130

Table 8.1D-4
Emission Rates and Stack Parameters for Refined Modeling

Equipment	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m^3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SOx	CO	PM10	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft^3/min	Exhaust Velocity, ft/s	Emission Rates, lb/hr NOx	SOx	CO	PM10
Averaging Period: 1-hour NOx Normal Operation																		
Gas Turbine 1	5.79	38.10	345.93	497.55	18.89	2.2393	n/a	n/a	n/a	19	125	163	1,054,243	62	17.77	n/a	n/a	n/a
Gas Turbine 2	5.79	38.10	345.93	497.55	18.89	2.2393	n/a	n/a	n/a	19	125	163	1,054,243	62	17.77	n/a	n/a	n/a
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	0	n/a	n/a	n/a	2.5	125	583	16,303	55	0	n/a	n/a	n/a
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	0.2940	n/a	n/a	n/a	0.5	22	891	1,227	104	2.33	n/a	n/a	n/a
Averaging Period: 1-hour CO and SO_2 Normal Operation																		
Gas Turbine 1	5.79	38.10	345.93	497.55	18.89	n/a	0.6512	2.7268	n/a	19	125	163	1,054,243	62	n/a	5.17	21.64	n/a
Gas Turbine 2	5.79	38.10	345.93	497.55	18.89	n/a	0.6512	2.7268	n/a	19	125	163	1,054,243	62	n/a	5.17	21.64	n/a
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	n/a	0	0	n/a	2.5	125	583	16,303	55	n/a	0	0	n/a
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	n/a	0.000333	0.03933	n/a	0.5	22	891	1,227	104	n/a	0.0026	0.31	n/a
Averaging Period: 3-hour SO_2 Normal Operation																		
Gas Turbine 1	5.79	38.10	344.82	464.82	17.65	n/a	**0.6512**	n/a	n/a	19	125	161	984,890	58	n/a	**5.17**	n/a	n/a
Gas Turbine 2	5.79	38.10	344.82	464.82	17.65	n/a	**0.6512**	n/a	n/a	19	125	161	984,890	58	n/a	**5.17**	n/a	n/a
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	n/a	0	n/a	n/a	2.5	125	583	16,303	55	n/a	0	n/a	n/a
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	n/a	0.000111	n/a	n/a	0.5	22	891	1,227	104	n/a	0.0009	n/a	n/a
Averaging Period: 8-hour CO Normal Operation																		
Gas Turbine 1	5.79	38.10	344.82	464.82	17.65	n/a	n/a	**2.727**	n/a	19	125	161	984,890	58	n/a	n/a	**21.64**	n/a
Gas Turbine 2	5.79	38.10	344.82	464.82	17.65	n/a	n/a	**2.727**	n/a	19	125	161	984,890	58	n/a	n/a	**21.64**	n/a
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	n/a	n/a	0	n/a	2.5	125	583	16,303	55	n/a	n/a	0	n/a
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	n/a	n/a	0.00492	n/a	0.5	22	891	1,227	104	n/a	n/a	0.039	n/a
Averaging Period: 24-hour SO_2																		
Gas Turbine 1	5.79	38.10	344.82	464.82	17.65	n/a	**0.6512**	n/a	n/a	19	125	161	984,890	58	n/a	**5.17**	n/a	n/a
Gas Turbine 2	5.79	38.10	344.82	464.82	17.65	n/a	**0.6512**	n/a	n/a	19	125	161	984,890	58	n/a	**5.17**	n/a	n/a
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	n/a	0	n/a	n/a	2.5	125	583	16,303	55	n/a	0	n/a	n/a
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	n/a	0.0000139	n/a	n/a	0.5	22	891	1,227	104	n/a	0.00011	n/a	n/a
Averaging Period: 24-hour PM10																		
Gas Turbine 1	5.79	38.10	354.26	299.74	11.38	n/a	n/a	n/a	1.2955	19	125	178	635,107	37	n/a	n/a	n/a	10.28
Gas Turbine 2	5.79	38.10	354.26	299.74	11.38	n/a	n/a	n/a	1.2955	19	125	178	635,107	37	n/a	n/a	n/a	10.28
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	n/a	n/a	n/a	0	2.5	125	583	16,303	55	n/a	n/a	n/a	0
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	n/a	n/a	n/a	**0.000389**	0.5	22	891	1,227	104	n/a	n/a	n/a	**0.00309**
Averaging Period: Annual NOx and SOx																		
Gas Turbine 1	5.79	38.10	344.82	464.82	17.65	1.4928	0.1584	n/a	n/a	19	125	161	984,890	58	11.85	1.26	n/a	n/a
Gas Turbine 2	5.79	38.10	344.82	464.82	17.65	1.4928	0.1584	n/a	n/a	19	125	161	984,890	58	11.85	1.26	n/a	n/a
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	0.00473	0	n/a	n/a	2.5	125	583	16,303	55	0.03754	0.E+00	n/a	n/a
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	0.00168	1.900E-06	n/a	n/a	0.5	22	891	1,227	104	0.01332	1.5E-05	n/a	n/a
Averaging Period: Annual PM10																		
Gas Turbine 1	5.79	38.10	349.26	311.86	11.84	n/a	n/a	n/a	0.9947	19	125	169	660,794	39	n/a	n/a	n/a	7.89
Gas Turbine 2	5.79	38.10	349.26	311.86	11.84	n/a	n/a	n/a	0.9947	19	125	169	660,794	39	n/a	n/a	n/a	7.89
Auxiliary Boiler	0.76	38.10	579.26	7.69	16.87	n/a	n/a	n/a	0	2.5	125	583	16,303	55	n/a	n/a	n/a	0
Firewater Pump Engine	0.15	6.71	750.37	0.58	31.75	n/a	n/a	n/a	0.0000533	0.5	22	891	1,227	104	n/a	n/a	n/a	0.00042

Table 8.1D-4
Emission Rates and Stack Parameters for Commissioning and Startups

Equipment	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m^3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SOx	CO	PM10	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft^3/min	Exhaust Velocity, ft/s	Emission Rates, lb/hr NOx	SOx	CO	PM10
Averaging Period: 1-hour NOx Startup																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	20.160	n/a	n/a	n/a	19	125	170	681,729	40	160	n/a	n/a	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	20.160	n/a	n/a	n/a	19	125	170	681,729	40	160	n/a	n/a	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	0.052	n/a	n/a	n/a	2.5	125	583	16,303	55	0.41	n/a	n/a	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	0	n/a	n/a	n/a	0.5	22	891	1,227	104	0	n/a	n/a	n/a
Averaging Period: 1-hour CO Startup																		
Gas Turbine 1	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**n/a**	**n/a**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**n/a**	**n/a**	**1000**	**n/a**
Gas Turbine 2	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**n/a**	**n/a**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**n/a**	**n/a**	**1000**	**n/a**
Auxiliary Boiler	**0.76**	**38.1**	**579**	**7.7**	**16.9**	**n/a**	**n/a**	**0.175**	**n/a**	**2.5**	**125**	**583**	**16,303**	**55**	**n/a**	**n/a**	**1.39**	**n/a**
Firewater Pump Engine	**0.15**	**6.7**	**750**	**0.58**	**31.7**	**n/a**	**n/a**	**0**	**n/a**	**0.5**	**22**	**891**	**1,227**	**104**	**n/a**	**n/a**	**0**	**n/a**
Averaging Period: 1-hour NOx, CO and SOx Commissioning																		
Gas Turbine 1	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**54.94**	**0.499**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**436**	**3.96**	**1000**	**n/a**
Gas Turbine 2	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**54.94**	**0.499**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**436**	**3.96**	**1000**	**n/a**
Auxiliary Boiler	**0.76**	**38.1**	**579**	**7.7**	**16.9**	**0.0518**	**0.0101**	**0.175**	**n/a**	**2.5**	**125**	**583**	**16,303**	**55**	**0.41**	**0.0801**	**1.39**	**n/a**
Firewater Pump Engine	**0.15**	**6.7**	**750**	**0.58**	**31.7**	**0**	**0**	**0**	**n/a**	**0.5**	**22**	**891**	**1,227**	**104**	**0**	**0**	**0**	**n/a**
Averaging Period: 8-hour CO Commissioning																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	n/a	n/a	126.0	n/a	19	125	170	681,729	40	n/a	n/a	1000	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	n/a	n/a	126.0	n/a	19	125	170	681,729	40	n/a	n/a	1000	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	n/a	n/a	0.175	n/a	2.5	125	583	16,303	55	n/a	n/a	1.39	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	n/a	n/a	0	n/a	0.5	22	891	1,227	104	n/a	n/a	0	n/a
Averaging Period: 3-hour SO_2 Commissioning																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	n/a	0.499	n/a	n/a	19	125	170	681,729	40	n/a	3.96	n/a	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	n/a	0.499	n/a	n/a	19	125	170	681,729	40	n/a	3.96	n/a	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	n/a	0.0101	n/a	n/a	2.5	125	583	16,303	55	n/a	0.0801	n/a	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	n/a	0	n/a	n/a	0.5	22	891	1,227	104	n/a	0	n/a	n/a

Table 8.1D-5
South Bay Replacement Project
Analysis of Impacts due to Inversion Breakup Fumigation

CTG Emission Rates, g/s

	NOx	CO	PM10	SO2
Case 1	1.928	2.348	1.296	0.571
Case 2	2.129	2.592	1.296	0.63
Case 3	2.239	2.727	1.296	0.663
Case 4	1.409	1.715	0.977	0.417
Case 5	1.605	1.954	0.977	0.475
Case 6	1.715	2.089	0.977	0.508
Case 7	0.932	1.135	0.977	0.276
Case 8	1.045	1.272	0.977	0.309
Case 9	1.106	1.347	0.977	0.327

Inversion Breakup Modeling Results from SCREEN3

	Unit Impacts, ug/m3 per g/s	Maximum One-Hour Avg Impacts, ug/m3				Distance to Maximum (m)
		NOx	CO	PM10	SO2	
Case 1	1.579	3.0443	3.7075	2.0464	0.9016	13,514
Case 2	1.589	3.3830	4.1187	2.0593	1.0011	13,453
Case 3	1.499	3.3563	4.0878	1.9427	0.9938	14,044
Case 4	1.438	2.0261	2.4662	1.4049	0.5996	14,477
Case 5	1.363	2.1876	2.6633	1.3317	0.6474	15,060
Case 6	1.295	2.2209	2.7053	1.2652	0.6579	15,643
Case 7	1.939	1.8071	2.2008	1.8944	0.5352	11,615
Case 8	1.980	2.0691	2.5186	1.9345	0.6118	11,439
Case 9	1.929	2.1335	2.5984	1.8846	0.6308	11,662

Table 8.1D-5 (cont'd)

Flat Terrain Modeling Results from SCREEN3

	Unit Impacts, ug/m3 per g/s	Maximum One-Hour Avg Impacts, ug/m3				Distance to Maximum (m)
		NOx	CO	PM10	SO2	
Case 1	1.295	2.4968	3.0407	1.6783	0.7394	1097
Case 2	1.306	2.7805	3.3852	1.6926	0.8228	1094
Case 3	1.205	2.6980	3.2860	1.5617	0.7989	1121
Case 4	1.138	1.6034	1.9517	1.1118	0.4745	1141
Case 5	1.057	1.6965	2.0654	1.0327	0.5021	1167
Case 6	1.014	1.7390	2.1182	0.9907	0.5151	1070
Case 7	1.716	1.5993	1.9477	1.6765	0.4736	1005
Case 8	1.765	1.8444	2.2451	1.7244	0.5454	997
Case 9	1.703	1.8835	2.2939	1.6638	0.5569	1008

Adjust unit impacts for longer averaging periods to account for 90-minute duration of fumigation

	1-hr unit	3-hr unit	8-hr unit	24-hr unit
Case 1	1.5790	1.4370	1.3483	1.3128
Case 2	1.5890	1.4475	1.3591	1.3237
Case 3	1.4990	1.3520	1.2601	1.2234
Case 4	1.4380	1.2880	1.1943	1.1568
Case 5	1.3630	1.2100	1.1144	1.0761
Case 6	1.2950	1.1545	1.0667	1.0316
Case 7	1.9390	1.8275	1.7578	1.7299
Case 8	1.9800	1.8725	1.8053	1.7784
Case 9	1.9290	1.8160	1.7454	1.7171

Table 8.1D-5 (cont'd)

Calculation of Fumigation Impacts for Two Units

Case/Avg Period	NOx	CO	PM10	SO2
One-Hour				
Case 1	6.0886	7.4150	-	1.8032
Case 2	6.7660	8.2374	-	2.0021
Case 3	6.7125	8.1755	-	1.9877
Case 4	4.0523	4.9323	-	1.1993
Case 5	4.3752	5.3266	-	1.2949
Case 6	4.4419	5.4105	-	1.3157
Case 7	3.6143	4.4015	-	1.0703
Case 8	4.1382	5.0371	-	1.2236
Case 9	4.2669	5.1967	-	1.2616
3 Hours				
Case 1	-	-	-	1.4769
Case 2	-	-	-	1.6415
Case 3	-	-	-	1.6135
Case 4	-	-	-	0.9668
Case 5	-	-	-	1.0346
Case 6	-	-	-	1.0557
Case 7	-	-	-	0.9079
Case 8	-	-	-	1.0415
Case 9	-	-	-	1.0689
8 Hours				
Case 1	-	4.4320	-	-
Case 2	-	4.9318	-	-
Case 3	-	4.8109	-	-
Case 4	-	2.8674	-	-
Case 5	-	3.0485	-	-
Case 6	-	3.1196	-	-
Case 7	-	2.7932	-	-
Case 8	-	3.2149	-	-
Case 9	-	3.2914	-	-
24 Hours				
Case 1	-	-	1.3611	0.5997
Case 2	-	-	1.3724	0.6671
Case 3	-	-	1.2684	0.6489
Case 4	-	-	0.9041	0.3859
Case 5	-	-	0.8411	0.4089
Case 6	-	-	0.8063	0.4192
Case 7	-	-	1.3521	0.3820
Case 8	-	-	1.3900	0.4396
Case 9	-	-	1.3421	0.4492

NOTES TO TABLE 8.1D-5

INVERSION BREAKUP FUMIGATION ANALYSIS

Inversion breakup fumigation is generally a short-term phenomenon and was evaluated here as persisting for up to 90 minutes. SCREEN3 was used to model one-hour unit impacts from the turbines under 2.5 m/s winds and F stability (for fumigation impacts) and under all meteorological conditions (shown in the table as "Inversion Breakup Modeling Results from SCREEN3").

For longer-term averaging periods, impacts were calculated using the highest modeled impact from SCREEN3 for the corresponding averaging period. A sample calculation for 24-hour average PM_{10} for Case 1 is as follows:

- For Case 1, 1-hour average unit impact = 1.579 μg/m3 per g/s
- For Case 1, max. 1-hour average flat terrain unit impact from SCREEN3 = 1.295 μg/m3 per g/s
- For Case 1, the appropriate unit impact for the 24-hour averaging period is calculated as 1.5 hours of inversion breakup fumigation plus 22.5 hours of operation under typical conditions (from SCREEN3): [(1.5 * 1.579 μg/m3 per g/s) + (22.5 * 1.295 μg/m3 per g/s)] ÷ 24 hrs = 1.3128 $\mu g/m^3$ per g/s
- The PM_{10} emission rate is 1.296 g/s; the SCREEN3 persistence factor for converting 1-hour impacts to 24-hour impacts is 0.4
- 24-hour PM_{10} impact under fumigation conditions is calculated as 1.3128 $\mu g/m^3$ per g/s * 1.296 g/s * 0.4 * 2 CTGs = 1.3611 $\mu g/m^3$

Table 8.1D-6
South Bay Replacement Project
Analysis of Impacts due to Shoreline Fumigation

CTG Emission Rates, g/s

	NOx	CO	PM10	SO2
Case 1	1.928	2.348	1.296	0.571
Case 2	2.129	2.592	1.296	0.63
Case 3	2.239	2.727	1.296	0.663
Case 4	1.409	1.715	0.977	0.417
Case 5	1.605	1.954	0.977	0.475
Case 6	1.715	2.089	0.977	0.508
Case 7	0.932	1.135	0.977	0.276
Case 8	1.045	1.272	0.977	0.309
Case 9	1.106	1.347	0.977	0.327

Shoreline Breakup Modeling Results from SCREEN3

	Unit Impacts, ug/m3 per g/s	Maximum One-Hour Avg Impacts, ug/m3				Distance to Maximum (m)
		NOx	CO	PM10	SO2	
Case 1	10.420	20.0898	24.4662	13.5043	5.9498	1236
Case 2	10.490	22.3332	27.1901	13.5950	6.6087	1230
Case 3	9.886	22.1348	26.9591	12.8123	6.5544	1294
Case 4	9.481	13.3587	16.2599	9.2629	3.9536	1342
Case 5	8.975	14.4049	17.5372	8.7686	4.2631	1406
Case 6	8.480	14.5432	17.7147	8.2850	4.3078	1476
Case 7	12.840	11.9669	14.5734	12.5447	3.5438	1031
Case 8	13.110	13.7000	16.6759	12.8085	4.0510	1012
Case 9	12.770	14.1236	17.2012	12.4763	4.1758	1036

Table 8.1D-6 (cont'd)

Flat Terrain Modeling Results from SCREEN3

	Unit Impacts, ug/m3 per g/s	Maximum One-Hour Avg Impacts, ug/m3				Distance to Maximum (m)
		NOx	CO	PM10	SO2	
Case 1	1.295	2.4968	3.0407	1.6783	0.7394	1097
Case 2	1.306	2.7805	3.3852	1.6926	0.8228	1094
Case 3	1.205	2.6980	3.2860	1.5617	0.7989	1121
Case 4	1.138	1.6034	1.9517	1.1118	0.4745	1141
Case 5	1.057	1.6965	2.0654	1.0327	0.5021	1167
Case 6	1.014	1.7390	2.1182	0.9907	0.5151	1070
Case 7	1.716	1.5993	1.9477	1.6765	0.4736	1005
Case 8	1.765	1.8444	2.2451	1.7244	0.5454	997
Case 9	1.703	1.8835	2.2939	1.6638	0.5569	1008

Adjust unit impacts for longer averaging periods to account for three-hour duration of shoreline fumigation

	1-hr unit	3-hr unit	8-hr unit	24-hr unit
Case 1	10.4200	10.4200	4.7169	2.4356
Case 2	10.4900	10.4900	4.7500	2.4540
Case 3	9.8860	9.8860	4.4604	2.2901
Case 4	9.4810	9.4810	4.2666	2.1809
Case 5	8.9750	8.9750	4.0263	2.0468
Case 6	8.4800	8.4800	3.8138	1.9473
Case 7	12.8400	12.8400	5.8875	3.1065
Case 8	13.1100	13.1100	6.0194	3.1831
Case 9	12.7700	12.7700	5.8531	3.0864

Table 8.1D-6 (cont'd)

Calculation of Fumigation Impacts for Two Units

Case/Avg Period	NOx	CO	PM10	SO2
One-Hour				
Case 1	40.1795	48.9323	-	11.8996
Case 2	44.6664	54.3802	-	13.2174
Case 3	44.2695	53.9182	-	13.1088
Case 4	26.7175	32.5198	-	7.9072
Case 5	28.8098	35.0743	-	8.5263
Case 6	29.0864	35.4294	-	8.6157
Case 7	23.9338	29.1468	-	7.0877
Case 8	27.3999	33.3518	-	8.1020
Case 9	28.2472	34.4024	-	8.3516
3 Hours				
Case 1	-	-	-	10.7097
Case 2	-	-	-	11.8957
Case 3	-	-	-	11.7980
Case 4	-	-	-	7.1164
Case 5	-	-	-	7.6736
Case 6	-	-	-	7.7541
Case 7	-	-	-	6.3789
Case 8	-	-	-	7.2918
Case 9	-	-	-	7.5164
8 Hours				
Case 1	-	15.5053	-	-
Case 2	-	17.2368	-	-
Case 3	-	17.0288	-	-
Case 4	-	10.2442	-	-
Case 5	-	11.0142	-	-
Case 6	-	11.1537	-	-
Case 7	-	9.3552	-	-
Case 8	-	10.7193	-	-
Case 9	-	11.0378	-	-
24 Hours				
Case 1	-	-	2.5253	1.1126
Case 2	-	-	2.5443	1.2368
Case 3	-	-	2.3744	1.2147
Case 4	-	-	1.7046	0.7275
Case 5	-	-	1.5997	0.7778
Case 6	-	-	1.5220	0.7914
Case 7	-	-	2.4280	0.6859
Case 8	-	-	2.4879	0.7869
Case 9	-	-	2.4123	0.8074

Table 8.1D-7
Emission Rates and Stack Parameters for Commissioning and Startups

Equipment	Stack Diam, m	Stack Height m	Temp, deg K	Exhaust Flow, m^3/s	Exhaust Velocity, m/s	Emission Rates, g/s NOx	SOx	CO	PM10	Stack Diam, ft	Stack Height ft	Exh Temp, Deg F	Exh Flow Rate, ft^3/min	Exhaust Velocity, ft/s	Emission Rates, lb/hr NOx	SOx	CO	PM10
Averaging Period: 1-hour NOx Startup																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	20.160	n/a	n/a	n/a	19	125	170	681,729	40	160	n/a	n/a	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	20.160	n/a	n/a	n/a	19	125	170	681,729	40	160	n/a	n/a	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	0.052	n/a	n/a	n/a	2.5	125	583	16,303	55	0.41	n/a	n/a	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	0	n/a	n/a	n/a	0.5	22	891	1,227	104	0	n/a	n/a	n/a
Averaging Period: 1-hour CO Startup																		
Gas Turbine 1	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**n/a**	**n/a**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**n/a**	**n/a**	**1000**	**n/a**
Gas Turbine 2	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**n/a**	**n/a**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**n/a**	**n/a**	**1000**	**n/a**
Auxiliary Boiler	**0.76**	**38.1**	**579**	**7.7**	**16.9**	**n/a**	**n/a**	**0.175**	**n/a**	**2.5**	**125**	**583**	**16,303**	**55**	**n/a**	**n/a**	**1.39**	**n/a**
Firewater Pump Engine	**0.15**	**6.7**	**750**	**0.58**	**31.7**	**n/a**	**n/a**	**0**	**n/a**	**0.5**	**22**	**891**	**1,227**	**104**	**n/a**	**n/a**	**0**	**n/a**
Averaging Period: 1-hour NOx, CO and SOx Commissioning																		
Gas Turbine 1	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**54.94**	**0.499**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**436**	**3.96**	**1000**	**n/a**
Gas Turbine 2	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**54.94**	**0.499**	**126.0**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**436**	**3.96**	**1000**	**n/a**
Auxiliary Boiler	**0.76**	**38.1**	**579**	**7.7**	**16.9**	**0.0518**	**0.0101**	**0.175**	**n/a**	**2.5**	**125**	**583**	**16,303**	**55**	**0.41**	**0.0801**	**1.39**	**n/a**
Firewater Pump Engine	**0.15**	**6.7**	**750**	**0.58**	**31.7**	**0**	**0**	**0**	**n/a**	**0.5**	**22**	**891**	**1,227**	**104**	**0**	**0**	**0**	**n/a**
Averaging Period: 8-hour CO Commissioning																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	n/a	n/a	126.0	n/a	19	125	170	681,729	40	n/a	n/a	1000	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	n/a	n/a	126.0	n/a	19	125	170	681,729	40	n/a	n/a	1000	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	n/a	n/a	0.175	n/a	2.5	125	583	16,303	55	n/a	n/a	1.39	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	n/a	n/a	0	n/a	0.5	22	891	1,227	104	n/a	n/a	0	n/a
Averaging Period: 3-hour SO_2 Commissioning																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	n/a	0.499	n/a	n/a	19	125	170	681,729	40	n/a	3.96	n/a	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	n/a	0.499	n/a	n/a	19	125	170	681,729	40	n/a	3.96	n/a	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	n/a	0.0101	n/a	n/a	2.5	125	583	16,303	55	n/a	0.0801	n/a	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	n/a	0	n/a	n/a	0.5	22	891	1,227	104	n/a	0	n/a	n/a
Averaging Period: 8-hour CO Startup																		
Gas Turbine 1	5.8	38.1	350	321.7	12.2	n/a	n/a	85.7317	n/a	19	125	**170**	**681,729**	40	n/a	n/a	**680.41**	n/a
Gas Turbine 2	5.8	38.1	350	321.7	12.2	n/a	n/a	85.7317	n/a	19	125	**170**	**681,729**	40	n/a	n/a	**680.41**	n/a
Auxiliary Boiler	0.76	38.1	579	7.7	16.9	n/a	n/a	0.1751	n/a	2.5	125	583	16,303	55	n/a	n/a	1.39	n/a
Firewater Pump Engine	0.15	6.7	750	0.58	31.7	n/a	n/a	0	n/a	0.5	22	891	1,227	104	n/a	n/a	0	n/a
Averaging Period: 24-hour SO_2 Commissioning																		
Gas Turbine 1	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**n/a**	**0.4987**	**n/a**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**n/a**	**3.958**	**n/a**	**n/a**
Gas Turbine 2	**5.8**	**38.1**	**350**	**321.7**	**12.2**	**n/a**	**0.4987**	**n/a**	**n/a**	**19**	**125**	**170**	**681,729**	**40**	**n/a**	**3.958**	**n/a**	**n/a**
Auxiliary Boiler	**0.76**	**38.1**	**579**	**7.7**	**16.9**	**n/a**	**0.0101**	**n/a**	**n/a**	**2.5**	**125**	**583**	**16,303**	**55**	**n/a**	**0.0801**	**n/a**	**n/a**
Firewater Pump Engine	**0.15**	**6.7**	**750**	**0.58**	**31.7**	**n/a**	**0**	**n/a**	**n/a**	**0.5**	**22**	**891**	**1,227**	**104**	**n/a**	**0**	**n/a**	**n/a**
Averaging Period: 24-hour PM-10 Commissioning																		
Gas Turbine 1	**5.8**	**38.1**	**354**	**299.7**	**11.4**	**n/a**	**n/a**	**n/a**	**2.27**	**19**	**125**	**178**	**635,107**	**37**	**n/a**	**n/a**	**n/a**	**18.00**
Gas Turbine 2	**5.8**	**38.1**	**354**	**299.7**	**11.4**	**n/a**	**n/a**	**n/a**	**2.27**	**19**	**125**	**178**	**635,107**	**37**	**n/a**	**n/a**	**n/a**	**18.00**
Auxiliary Boiler	**0.76**	**38.1**	**579**	**7.7**	**16.9**	**n/a**	**n/a**	**n/a**	**0.0239**	**2.5**	**125**	**583**	**16,303**	**55**	**n/a**	**n/a**	**n/a**	**0.19**
Firewater Pump Engine	**0.15**	**6.7**	**750**	**0.58**	**31.7**	**n/a**	**n/a**	**n/a**	**0**	**0.5**	**22**	**891**	**1,227**	**104**	**n/a**	**n/a**	**n/a**	**0**

Figure 8.1D-1

Building Layout for GEP Analysis

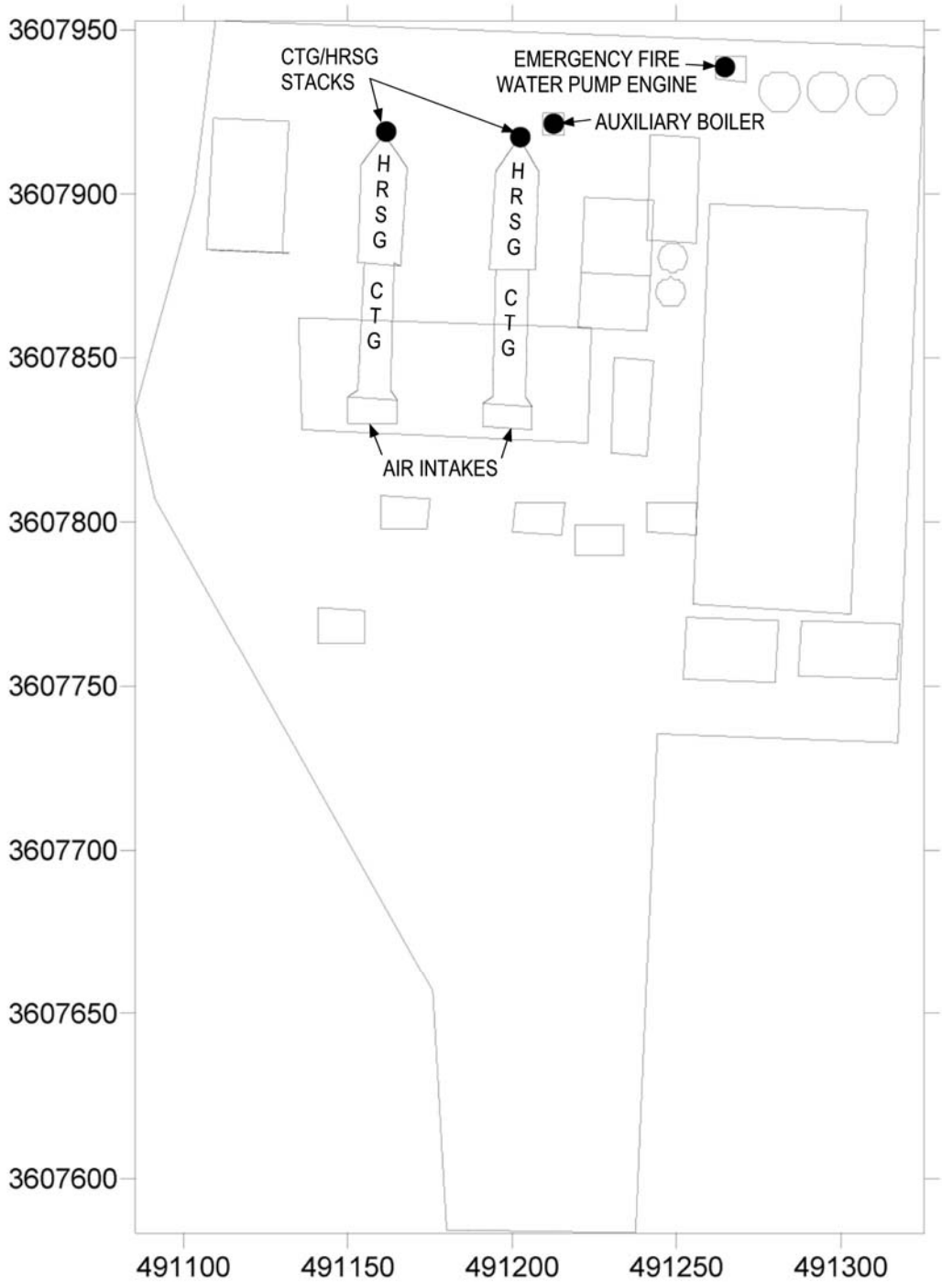
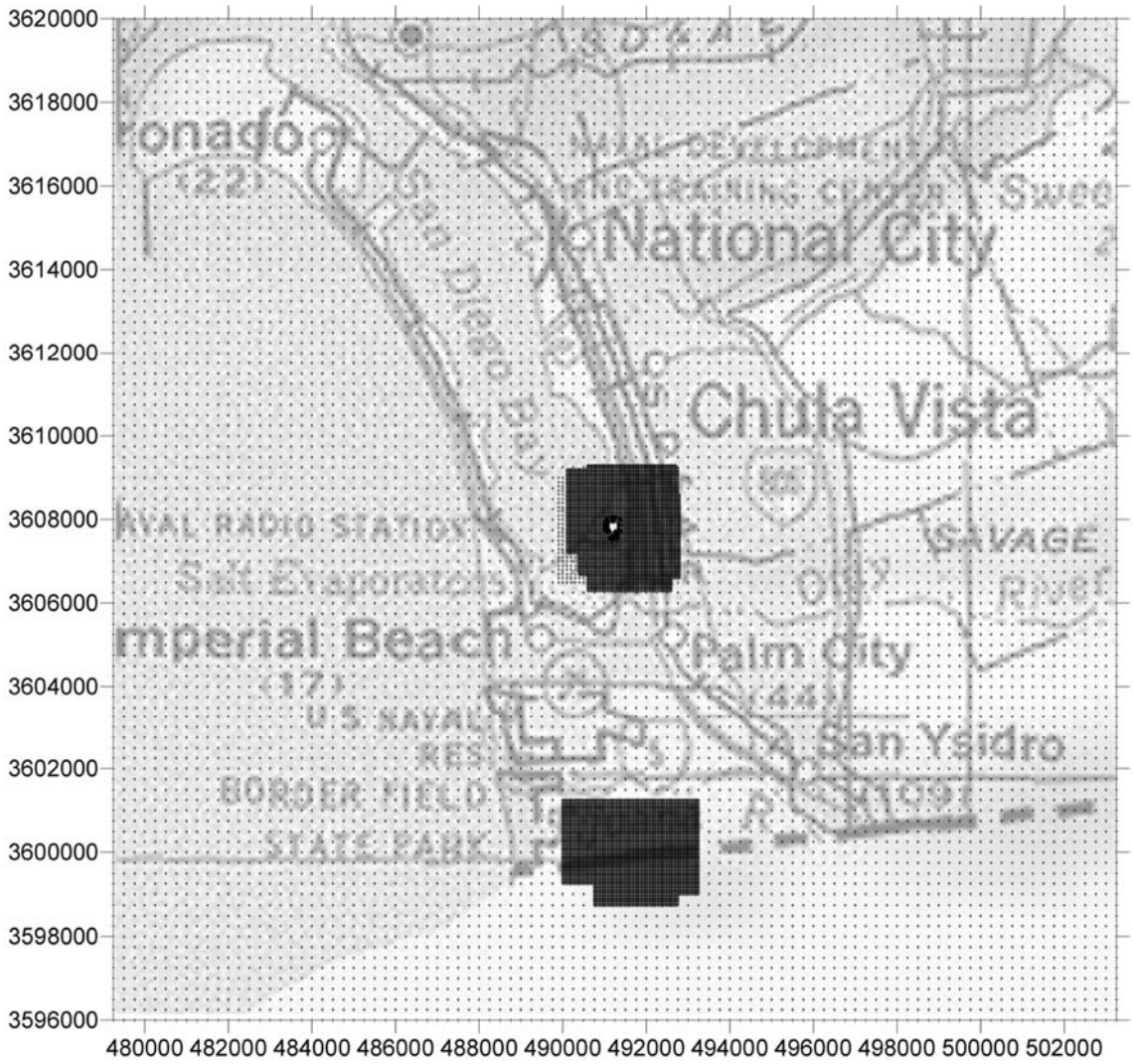


Figure 8.1D-2

Layout of the Receptor Grids: AERMOD