APPENDIX 3.1B

Modeling Support Data

APPENDIX 3.1B

Modeling Support Data

The original AFC Appendix 8.1B is now Amendment Appendix 3.1B. Significant changes have occurred with respect to proposed emissions and operational scenarios, and as such this appendix presents updated dispersion and impact data for the new facility site and configuration.

Tables presented in this Appendix are as follows:

3.1B-1 Screening Modeling Parameters

3.1B-2 Emission Rates and Stack Parameters for Modeling

3.1B-3 Summary Table of Building and Property Dimensions

3.1B-4 Detailed Stack Information

3.1B-5 Construction Impacts Modeling Input Data

3.1B-6 Construction Impacts Summary

Figures presented in this Appendix are as follows:

Figure 3.1B-1 Building Plot Plan

Figure 3.1B-2 Receptor Maps

Figure 3.1B-3 Class I Area Receptors

The climate and meteorological data used in the dispersion and impacts analysis has not changed and is therefore not presented in this appendix.

Modeling input/output files are included in the enclosed CD's.

Table 3.1B-1 Screening Modleling Parameters
Operating Emissions

HRSG Operating Conditions		ISO			July Peak			December		
		Case 1	Case 4	Case 13	Case 14	Case 15	Case 21	Case 22	Case 23	Case 25
		Max. w/ Fire	Max. w/o Fire	Min. - 1 CT 60%	Max. w/ Fire	Max. w/o Fire	Min. - 1 CT 60%	Max. w/ Fire	Max. w/o Fire	Min. - 1 CT 60%
Combustion Turbine Load	%	100%	100%	60%	100%	100%	60%	100%	100%	60%
Stack Temperature	deg. F	182.62	194.35	173.29	187.82	199.13	171.56	180.04	193.32	172.82
Stack Temperature	deg. K	356.83	363.34	351.64	359.72	366.00	350.68	355.39	362.77	351.38
Stack Flow	cf/hr	65084000	66021000	45593000	63308000	64161000	42304000	66648000	67780000	47407000
Stack Velocity	ft/sec	71.046	72.069	49.769	69.107	70.038	46.179	72.753	73.989	51.749
	m/sec	21.655	21.967	15.170	21.064	21.348	14.075	22.175	22.552	15.773
Permitted Stack Emissions (each turbine)										
NOx, as NO2	lb/hr	15.664	14.204	9.543	14.968	13.508	8.730	16.174	14.713	10.038
CO	lb/hr	19.074	17.296	11.621	18.227	16.448	10.631	19.695	17.916	12.223
Total PM10	lb/hr	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000	9.000
Maximum SO2	lb/hr	6.000	5.500	3.700	5.800	5.200	3.400	6.200	5.700	3.900
Annual Average SO2	lb/hr	1.500	1.400	0.900	1.400	1.300	0.800	1.600	1.400	1.000
NOx, as NO2	g/s/turbine	1.9737	1.7897	1.2024	1.8860	1.7020	1.1000	2.0379	1.8538	1.2648
CO	g/s/turbine	2.4033	2.1793	1.4642	2.2966	2.0724	1.3395	2.4816	2.2574	1.5401
Total PM10	g/s/turbine	1.1340	1.1340	1.1340	1.1340	1.1340	1.1340	1.1340	1.1340	1.1340
Maximum SO2	g/s/turbine	0.7560	0.6930	0.4662	0.7308	0.6552	0.4284	0.7812	0.7182	0.4914
Unitized Impacts (1 g/s each turbine)										
1-Hour Impact	ug/m3	6.19922	6.12916	6.92935	6.19587	6.12425	7.32025	6.19865	6.11064	6.82843
Impact Location	UTM-X(m)	583,600.00	583,600.00	582,600.00	583,600.00	583,600.00	576,760.00	583,600.00	583,600.00	582,600.00
	UTM-Y(m)	4,167,400.00	4,167,400.00	4,168,400.00	4,167,400.00	4,167,400.00	4,165,330.00	4,167,400.00	4,167,400.00	4,168,400.00
Time Period Ending	YYMMDDHH	93073121	93073121	93073121	93073121	93073121	93011403	93073121	93073121	93073121
3-Hour Impact	ug/m3	5.66684	5.51154	6.16790	5.66026	5.51639	6.30579	5.65377	5.46988	6.09665
Impact Location	UTM-X(m)	584,200.00	584,200.00	584,000.00	584,200.00	584,200.00	584,000.00	584,200.00	584,200.00	584,000.00
	UTM-Y(m)	4,166,600.00	4,166,600.00	4,166,600.00	4,166,600.00	4,166,600.00	4,166,600.00	4,166,600.00	4,166,600.00	4,166,600.00
Time Period Ending	YYMMDDHH	93020624	93020624	93020624	93020624	93020624	93020624	93020624	93020624	93020624
8-Hour Impact	ug/m3	2.14839	2.13139	3.67684	2.14752	2.13181	4.22119	2.14707	2.12609	3.46807
Impact Location	UTM-X(m)	583,600.00	583,600.00	576,760.00	583,600.00	583,600.00	576,760.00	583,600.00	583,600.00	576,760.00
	UTM-Y(m)	4,167,600.00	4,167,600.00	4,165,300.00	4,167,600.00	4,167,600.00	4,165,300.00	4,167,600.00	4,167,600.00	4,165,300.00
Time Period Ending	YYMMDDHH	94060408	94060408	91051716	94060408	94060408	91051716	94060408	94060408	91051716
24-Hour Impact	ug/m3	0.84583	0.82859	2.28768	0.84460	0.82861	2.57811	0.84477	0.82417	2.17587
Impact Location	UTM-X(m)	584,200.00	584,200.00	576,790.00	584,200.00	584,200.00	576,790.00	584,200.00	584,200.00	576,790.00
	UTM-Y(m)	4,166,200.00	4,166,200.00	4,165,290.00	4,166,200.00	4,166,200.00	4,165,290.00	4,166,200.00	4,166,200.00	4,165,290.00
Time Period Ending	YYMMDDHH	90092524	90092524	91051724	90092524	90092524	91051724	90092524	90092524	91051724
Pollutant Impacts										
NOx 1-Hour Impact	ug/m3	12.23540	10.96936	8.33185	11.68541	10.42347	8.05228	12.63223	11.32790	8.63660
CO 1-Hour Impact	ug/m3	14.89859	13.35728	10.14595	14.22944	12.69190	9.80547	15.38257	13.79416	10.51647
SO2 1-Hour Impact	ug/m3	4.68661	4.24751	3.23046	4.52794	4.01261	3.13600	4.84239	4.38866	3.35549
SO2 3-Hour Impact	ug/m3	4.28413	3.81950	2.87547	4.13652	3.61434	2.70140	4.41673	3.92847	2.99589
CO 8-Hour Impact	ug/m3	5.16323	4.64494	5.38363	4.93199	4.41796	5.65428	5.32817	4.79944	5.34117
SO2 24-Hour Impact	ug/m3	0.63945	0.57421	1.06652	0.61723	0.54291	1.10446	0.65993	0.59192	1.06922
PM 24-Hour Impact	ug/m3	0.95917	0.93962	2.59423	0.95778	0.93964	2.92358	0.95797	0.93461	2.46744

TABLE 3.1B-2 STACK PARAMETERS AND EMISSION RATES FOR REFINED ISCST3 MODELING [1]

					Emission Rates (g/s) for each turbine/HRSG and cooling tower cell			
	Stack Height (m)	Stack Diam (m)	Stack Temp (deg K)	Exhaust Velocity (m/s)	NO_X	SO_2	CO	PM10/2.5
Averaging Period: 1-hour for Normal Operating Conditions								
Turbines/HRSGs	44.196	5.4864	355.39	22.175	2.0379	0.7812	2.4816	N/A
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	0.3558	3.942E-4	0.0275	N/A
Averaging Period: 3-hours for Normal Operating Conditions								
Turbines/HRSGs	44.196	5.4864	355.39	22.175	N/A	0.7812	N/A	N/A
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	N/A	1.314E-4	N/A	N/A
Averaging Period: 8-hours for Normal Operating Conditions								
Turbines/HRSGs	44.196	5.4864	350.68	14.075	N/A	N/A	1.3395	N/A
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	N/A	N/A	0.0034	N/A
Averaging Period: 24 hours for Normal Operating Conditions								
Turbines/HRSGs	44.196	5.4864	350.68	14.075	N/A	0.4284	N/A	1.1340
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	N/A	1.640E-5	N/A	4.167E-4
Cooling Tower	18.288	9.7536	298.17	10.308	N/A	N/A	N/A	0.0396
Averaging Period: Annual for Normal Operating Conditions								
Turbines/HRSGs	44.196	5.4864	356.83	21.655	1.9350	0.1755	N/A	1.0742
Fire Pump Diesel Engine	4.572	0.1524	665.37	53.340	2.112E-3	2.339E-6	N/A	5.936E-5
Cooling Tower	18.288	9.7536	300.27	10.308	N/A	N/A	N/A	0.0387
Averaging Period: 1-hour for Turbine Start-up/Shutdown Conditions								
Turbines/HRSGs	44.196	5.4864	355.39	22.175	12.2464	N/A	169.946	N/A
Averaging Period: 8-hours for Turbine Start-up/Shutdown Conditions								
Turbines/HRSGs	44.196	5.4864	355.39	22.175	N/A	N/A	80.2353	N/A

[1]Annual averaging periods include include start-up/shutdown emissions, where applicable.

Table 3.1B-3 Summary of Building and Propert Dimensions

UTM Coors X(m)	UTM Coors Y(m)	Bld/Stk	Ht(m)	TommyCAD Coors X(m)	TommyCAD Coors Y(m)	Diff. (UTM-TommyCAD) X(m)	Diff. (UTM-TommyCAD) Y(m)			
576552.23	**4165363.93**	EHRSG	44.196	-193.1972	93.3770	576745.4232	4165270.5530	36.576	36.6318	
576515.65	4165363.93	WHRSG	44.196	-229.8290	93.3770	**576745.4790**	**4165270.5530**	36.566054		48.387
576424.97	4165459.04	CTWR1	18.288	-320.5115	188.4886	576745.4815	4165270.5514			
576417.23	4165475.65	CTWR2	18.288	-328.2530	205.1010					
576409.48	4165492.27	CTWR3	18.288	-335.9945	221.7134					
576401.74	4165508.88	CTWR4	18.288	-343.7360	238.3258					
576394.00	4165525.49	CTWR5	18.288	-351.4775	254.9382					
576386.26	4165542.10	CTWR6	18.288	-359.2190	271.5506					
576378.52	4165558.72	CTWR7	18.288	-366.9605	288.1630					
576370.78	4165575.33	CTWR8	18.288	-374.7020	304.7754					
576363.04	4165591.94	CTWR9	18.288	-382.4431	321.3879	576745.4831	4165270.5521			
						Distance from Turbine Stacks				
576458.77	4165461.94	FPUMP	**4.572**				135.4 E			
							113.3 W			
576350.58	4165596.31	CTWR	14.021	-394.9010	325.7585					
576420.30	4165446.66			-325.1750	176.1119					
576437.44	4165454.67			-308.0398	184.1161					
576367.70	4165604.30			-377.7813	333.7473					
576350.58	4165596.31									
576457.19	4165623.47	WAREHS	7.620	-288.2901	352.9154					
576457.19	4165604.67			-288.2901	334.1129					
576492.91	4165604.67			-252.5726	334.1129					
576492.91	4165623.47			-252.5726	352.9154					
576457.19	4165623.47									
576458.55	4165474.54	FPENC	2.438	-286.9244	203.9892					
576458.55	4165464.46			-286.9244	193.9020					
576463.61	4165464.46			-281.8654	193.9020					
576463.61	4165474.54			-281.8654	203.9892					
576458.55	4165474.54									
576474.38	4165459.52	GENBLD	18.898	-271.1033	188.9686					
576474.38	4165425.61			-271.1033	155.0569					
576486.80	4165425.61			-258.6763	155.0569					
576486.80	4165459.52			-258.6763	188.9686					
576474.38	4165459.52									
576417.73	4165603.48	WATRPAV	7.620	-327.7499	332.9220					
576445.38	4165603.48			-300.0949	332.9220					
576445.38	4165581.73			-300.0949	311.1743					
576417.73	4165581.73			-327.7499	311.1743					
576417.73	4165603.48									
576433.08	4165521.30	COOLPAV	7.315	-312.3954	250.7512					
576444.84	4165521.30			-300.6393	250.7512					
576444.84	4165496.82			-300.6393	226.2657					
576433.08	4165496.82			-312.3954	226.2657					
576433.08	4165521.30									
576464.51	4165408.72	CTLBLD	6.096	-280.9708	138.1685					
576483.31	4165408.72			-262.1706	138.1685					
576483.31	4165359.68			-262.1706	89.1266					
576464.51	4165359.68			-280.9708	89.1266					
576464.51	4165408.72									
								Separation		
576508.93	4165455.92	WTURBIN	23.470	-236.5507	185.3672			(ft)		
576508.93	4165454.48			-236.5507	183.9289					
576508.78	4165454.48			-236.7011	183.9289			120.20		
576508.78	4165448.53			-236.7011	177.9776					
576513.42	4165443.65			-232.0635	173.0921			120.19		
576517.88	4165443.65			-227.5956	173.0921			120.27		
576522.52	4165448.53			-222.9600	177.9776			120.19		
576522.52	4165454.48			-222.9600	183.9289					
576522.32	4165454.48			-223.1566	183.9289			120.19		
576522.32	4165455.92			-223.1566	185.3672					
576508.93	4165455.92									
576546.28	4165455.92	ETURBIN	23.470	-199.1982	185.3672					
576546.28	4165454.48			-199.1982	183.9289					
576545.41	4165454.48			-200.0647	183.9289					
576545.41	4165448.53			-200.0647	177.9776					
576550.05	4165443.65			-195.4294	173.0921					
576554.54	4165443.65			-190.9384	173.0921					
576559.15	4165448.53			-186.3263	177.9776					
576559.15	4165454.48			-186.3263	183.9289					
576558.96	4165454.48			-186.5229	183.9289					
576558.96	4165455.92			-186.5229	185.3672					
576546.28	4165455.92									

BLD/STACK HEIGHTS

	Bld/Stk	Ht(m)	Ht(ft-in)	Len(ft)	Wid(ft)
Stacks	HRSG	44.196	145		
	CoolTwr	18.288	60		
	Firepump	**4.572**	**15**		
Buildings	CoolTwr	14.021	46	541.65	62.07
	Warehouse	7.620	25	117.19	61.68
	Firepump	**2.438**	**8**	33.07	16.60
	Gen.Bld	18.898	62	111.25	40.75
	ControlBld	6.096	20	71.36	90.72
	Turb-Intake	23.470	77	45.08	40.26
	Turbine	19.050	62 6/12	32.35	14.63
	HRSG	24.384	80	127.56	63.91
	WatrPav	7.620	25	90.72	71.36
	CoolPav	7.315	24	80.31	38.58
				Diam(ft)	
Water Tanks	Recycled	14.326	47	54.000	
	Firepump	11.582	38	36.000	
	Demin	8.839	29	28.000	
	CoolWtr	9.144	30	30.000	
	ZDA Towers	24.689	81	16.000	

576513.42	4165443.65	WTURBIN2	19.050	-232.0635	173.0921			120.19	
576513.42	4165433.79			-232.0635	163.2416				
576517.88	4165433.79			-227.5956	163.2416			120.27	
576517.88	4165443.65			-227.5956	173.0921				
576513.42	4165443.65								
576550.05	4165443.65	ETURBIN2	19.050	-195.4294	173.0921				
576550.05	4165433.79			-195.4294	163.2416				
576554.54	4165433.79			-190.9384	163.2416				
576554.54	4165443.65			-190.9384	173.0921				
576550.05	4165443.65								
576512.55	4165410.97	WHRSG	24.384	-232.9338	140.4164				
576510.68	4165403.34			-234.7978	132.7879				
576506.62	4165403.34			-238.8558	132.7879			120.19	
576506.62	4165397.98			-238.8558	127.4273				
576505.95	4165397.98			-239.5267	127.4273			120.18	
576505.95	4165384.39			-239.5267	113.8334				
576506.65	4165384.39			-238.8327	113.8334			120.18	
576506.65	4165373.00			-238.8327	102.4490				
576524.61	4165373.00			-220.8731	102.4490			120.34	
576524.61	4165384.39			-220.8731	113.8334				
576525.42	4165384.39			-220.0556	113.8334			120.19	
576525.42	4165395.08			-220.0556	124.5230				
576523.29	4165395.08			-222.1887	124.5230			120.19	
576523.29	4165405.52			-222.1887	134.9650				
576520.11	4165405.52			-225.3738	134.9650			120.20	
576518.77	4165410.97			-226.7079	140.4164				
576512.55	4165410.97								
576549.38	4165411.88	EHRSG	24.384	-196.0984	141.3289				
576547.32	4165403.34			-198.1567	132.7879				
576543.26	4165403.34			-202.2209	132.7879				
576543.26	4165397.98			-202.2209	127.4273				
576542.58	4165397.98			-202.8965	127.4273				
576542.58	4165384.39			-202.8965	113.8334				
576543.28	4165384.39			-202.2024	113.8334				
576543.28	4165373.00			-202.2024	102.4490				
576561.28	4165373.00			-184.1943	102.4490				
576561.28	4165384.39			-184.1943	113.8334				
576562.06	4165384.39			-183.4231	113.8334				
576562.06	4165395.08			-183.4231	124.5230				
576559.92	4165395.08			-185.5562	124.5230				
576559.92	4165405.52			-185.5562	134.9650				
576556.74	4165405.52			-188.7381	134.9650				
576555.19	4165411.88			-190.2906	141.3289				
576549.38	4165411.88								
576604.95	4165465.23	RECYWATR	14.326	-140.5246	186.4469	-140.5246	194.6765	0.0	Origin
576608.10	4165464.60			8.2296		-137.3753	194.0501	22.5	Radius
576610.77	4165462.82					-134.7054	192.2661	45.0	
576612.56	4165460.15					-132.9214	189.5962	67.5	
576613.18	4165457.00					-132.2950	186.4469	90.0	
576612.56	4165453.85					-132.9214	183.2976	112.5	
576610.77	4165451.18					-134.7054	180.6277	135.0	
576608.10	4165449.40					-137.3753	178.8437	157.5	
576604.95	4165448.77					-140.5246	178.2173	180.0	
576601.81	4165449.40					-143.6739	178.8437	202.5	
576599.14	4165451.18					-146.3438	180.6277	225.0	
576597.35	4165453.85					-148.1278	183.2976	247.5	
576596.72	4165457.00					-148.7542	186.4469	270.0	
576597.35	4165460.15					-148.1278	189.5962	292.5	
576599.14	4165462.82					-146.3438	192.2661	315.0	
576601.81	4165464.60					-143.6739	194.0501	337.5	
576604.95	4165465.23								
576475.17	4165480.93	FIREWATR	11.582	-270.3090	204.8939	-270.3090	210.3803	0.0	Origin
576477.27	4165480.52			5.4864		-268.2094	209.9627	22.5	Radius
576479.05	4165479.33					-266.4295	208.7734	45.0	
576480.24	4165477.55					-265.2402	206.9935	67.5	
576480.66	4165475.45					-264.8226	204.8939	90.0	
576480.24	4165473.35					-265.2402	202.7943	112.5	
576479.05	4165471.57					-266.4295	201.0144	135.0	
576477.27	4165470.38					-268.2094	199.8251	157.5	
576475.17	4165469.96					-270.3090	199.4075	180.0	
576473.07	4165470.38					-272.4086	199.8251	202.5	
576471.29	4165471.57					-274.1885	201.0144	225.0	
576470.10	4165473.35					-275.3778	202.7943	247.5	
576469.68	4165475.45					-275.7954	204.8939	270.0	
576470.10	4165477.55					-275.3778	206.9935	292.5	
576471.29	4165479.33					-274.1885	208.7734	315.0	
576473.07	4165480.52					-272.4086	209.9627	337.5	
576475.17	4165480.93								

576441.79	4165490.08	DMINWATR	8.839	-303.6902	215.2572	-303.6902	219.5244	0.0	Origin
576443.42	4165489.75			4.2672		-302.0572	219.1996	22.5	Radius
576444.81	4165488.83					-300.6728	218.2746	45.0	
576445.73	4165487.44					-299.7478	216.8902	67.5	
576446.06	4165485.81					-299.4230	215.2572	90.0	
576445.73	4165484.18					-299.7478	213.6242	112.5	
576444.81	4165482.79					-300.6728	212.2398	135.0	
576443.42	4165481.87					-302.0572	211.3148	157.5	
576441.79	4165481.54					-303.6902	210.9900	180.0	
576440.16	4165481.87					-305.3232	211.3148	202.5	
576438.77	4165482.79					-306.7076	212.2398	225.0	
576437.85	4165484.18					-307.6326	213.6242	247.5	
576437.52	4165485.81					-307.9574	215.2572	270.0	
576437.85	4165487.44					-307.6326	216.8902	292.5	
576438.77	4165488.83					-306.7076	218.2746	315.0	
576440.16	4165489.75					-305.3232	219.1996	337.5	
576441.79	4165490.08								
576409.71	4165577.02	COOLWATR	9.144	-335.7642	301.8968	-335.7642	306.4688	0.0	Origin
576411.46	4165576.67			4.5720	15.0000	-334.0146	306.1208	22.5	Radius
576412.95	4165575.68			meters	feet	-332.5313	305.1297	45.0	
576413.94	4165574.20					-331.5402	303.6464	67.5	
576414.29	4165572.45					-331.1922	301.8968	90.0	
576413.94	4165570.70					-331.5402	300.1472	112.5	
576412.95	4165569.22					-332.5313	298.6639	135.0	
576411.46	4165568.23					-334.0146	297.6728	157.5	
576409.71	4165567.88					-335.7642	297.3248	180.0	
576407.97	4165568.23					-337.5138	297.6728	202.5	
576406.48	4165569.22					-338.9971	298.6639	225.0	
576405.49	4165570.70					-339.9882	300.1472	247.5	
576405.14	4165572.45					-340.3362	301.8968	270.0	
576405.49	4165574.20					-339.9882	303.6464	292.5	
576406.48	4165575.68					-338.9971	305.1297	315.0	
576407.97	4165576.67					-337.5138	306.1208	337.5	
576409.71	4165577.02								
576431.08	4165565.51	ZDA-A	24.689	-314.3952	292.5217	-314.3952	294.9601	0.0	Origin
576432.02	4165565.33			2.4384	8.0000	-313.4621	294.7745	22.5	Radius
576432.81	4165564.80			meters	feet	-312.6710	294.2459	45.0	
576433.34	4165564.01			2.7392	8.9869	-312.1424	293.4548	67.5	
576433.52	4165563.07			Measured=	8.4375	-311.9568	292.5217	90.0	
576433.34	4165562.14					-312.1424	291.5886	112.5	
576432.81	4165561.35					-312.6710	290.7975	135.0	
576432.02	4165560.82					-313.4621	290.2689	157.5	
576431.08	4165560.64					-314.3952	290.0833	180.0	
576430.15	4165560.82					-315.3283	290.2689	202.5	
576429.36	4165561.35					-316.1194	290.7975	225.0	
576428.83	4165562.14					-316.6480	291.5886	247.5	
576428.65	4165563.07					-316.8336	292.5217	270.0	
576428.83	4165564.01					-316.6480	293.4548	292.5	
576429.36	4165564.80					-316.1194	294.2459	315.0	
576430.15	4165565.33					-315.3283	294.7745	337.5	
576431.08	4165565.51								
576433.59	4165548.72	ZDA-B	24.689	-311.8903	275.7259	-311.8903	278.1643	0.0	Origin
576434.52	4165548.53			2.4384	8.0000	-310.9572	277.9787	22.5	Radius
576435.31	4165548.00			meters	feet	-310.1661	277.4501	45.0	
576435.84	4165547.21					-309.6375	276.6590	67.5	
576436.03	4165546.28					-309.4519	275.7259	90.0	
576435.84	4165545.35					-309.6375	274.7928	112.5	
576435.31	4165544.55					-310.1661	274.0017	135.0	
576434.52	4165544.03					-310.9572	273.4731	157.5	
576433.59	4165543.84					-311.8903	273.2875	180.0	
576432.66	4165544.03					-312.8234	273.4731	202.5	
576431.86	4165544.55					-313.6145	274.0017	225.0	
576431.34	4165545.35					-314.1431	274.7928	247.5	
576431.15	4165546.28					-314.3287	275.7259	270.0	
576431.34	4165547.21					-314.1431	276.6590	292.5	
576431.86	4165548.00					-313.6145	277.4501	315.0	
576432.66	4165548.53					-312.8234	277.9787	337.5	
576433.59	4165548.72								

				Convert to Old Coors		New t4g Coordinates		
576329.57	4165625.46	FENCELINE	1	-415.9046	354.9043	-185.8284	255.3563	
576547.00	4165637.07		2	-198.4778	366.5130	31.5984	266.9650	
576553.84	4165599.85		3	-191.6430	329.2926	38.4332	229.7446	
576614.24	4165606.23		4	-131.2390	335.6768	98.8372	236.1288	
576634.96	4165472.31		5	-110.5152	201.7537	119.5610	102.2057	
576619.61	4165472.49		6	-125.8713	201.9385	104.2049	102.3905	
576618.07	4165346.25		7	-127.4115	75.6935	102.6647	-23.8545	
576486.07	4165346.25		8	-259.4109	75.6935	-29.3347	-23.8545	
576477.54	4165332.27		9	-267.9399	61.7197	-37.8637	-37.8283	Close - Both coor systems
576480.06	4165328.14		10	-265.4178	57.5842	-35.3416	-41.9638	are in meters, just have
576470.68	4165322.44		11	-274.7970	51.8846	-44.7208	-47.6634	different origins - Use #14
576442.62	4165368.51		12	-302.8639	97.9606	-72.7877	-1.5874	to adjust New->Old
576442.62	4165393.92		13	-302.8639	123.3667	-72.7877	23.8187	
576394.39	4165475.26		**14**	**-351.0924**	**204.7063**	-121.0162	105.1583	27.583793
576366.80	4165475.59		**15**	**-378.6742**	**205.0379**	-148.5332	105.4972	27.519087
576346.51	4165531.64		16	-398.9674	261.0865	-168.8912	161.5385	
576329.57	4165625.46							

CALPINE

Table 3.1B-4 Detailed Stack Information

HRSG Stack Sizing

Stack Diameter, ft	
Exhaust Flow, lb/hr	4,038,946
Stack Temperature, deg. F	180
Exhaust Molecular Weight	28.39
Site Elevation, ft	9.5
Ambient Pressure, psia	14.69
Maximum Velocity, fps	75.0
Minimum Stack Diameter, ft	17.7
Selected Stack Diameter, ft	18.0
Actual Velocity, fps	72.6
Stack Height	
Finished Grade to Top of Foundation, ft	0.5
Top of Foundation to Top of Breeching, ft	80.0
Stack Damper, ft	10.0
Stack Silencer, ft	-
Last Disturbance to Test Ports, diameters	2.0
Test Ports to Stack Outlet, diameter	0.5
Minimum Stack Height, ft (above top of foundation)	135.0
Selected Stack Height, ft (above top of foundation)	145.0
Selected Stack Height, ft (above finshed grade)	145.5
Top of Stack Elevation, ft	155.0
Stack Height to HRSG Height Ratio	1.8

Table 3.1B-5 Modeling Inputs/Results for Russell City Energy Center Construction Impacts (Combustion Sources as 28 10-Foot Point Sources)

Short Term Impacts (24 hrs and less)						Long Term Impacts (annual)					
	NOx	CO	SOx	PM10	PM2.5		NOx	CO	SOx	PM10	PM2.5
Combustion (lbs/day)	173.6	76.1	34.1	11.2	10.3	Combustion (tons/yr)	10.6	5.2	2.4	0.74	0.68
						Combustion (days/yr)	312	312	312	312	312
Combustion (hrs/day)	10	10	10	10	10	Combustion (hrs/day)	10	10	10	10	10
Combustion (lbs/hr)	17.36	7.61	3.41	1.12	1.03	Combustion (lbs/hr)	6.79	3.33	1.54	0.47	0.44
Combustion (g/sec)	2.19E+00	9.59E-01	4.30E-01	1.41E-01	1.30E-01	Combustion (g/sec)	8.56E-01	4.20E-01	1.94E-01	5.98E-02	5.49E-02
Construction Dust (lbs/day)				16.46	3.45	Construction Dust (tons/yr)				0.86	0.18
						Construction Dust (days/yr)				312	312
Construction Dust (hrs/day)				10	10	Construction Dust (hrs/day)				10	10
Construction Dust (lbs/hr)				1.65	0.35	Construction Dust (lbs/hr)				0.55	0.12
Construction Dust (g/sec)				2.07E-01	4.35E-02	Construction Dust (g/sec)				6.95E-02	1.45E-02
ISCST3 Inputs	**66593 m2**					**Number Combustion Sources**	**28**				
Combustion (g/s/src)	0.0781	0.0342	0.0153	0.0050	0.0046	Combustion (g/s/src)	0.0306	0.0150	0.0069	0.0021	0.0020
Construction Dust (g/s/m2)				3.114E-06	6.528E-07	Construction Dust (g/s/m2)				1.043E-06	2.183E-07
ISCST3 Results (ug/m3)											
Combustion Only						Combustion Only					
1-hour Max	114.947	50.389	22.579	7.41593							
3-hour Max			19.270	6.32909							
8-hour Max		35.193		5.17954							
24-hour Max			6.989	2.29546	2.11182	Annual	7.087		1.605	0.49473	0.47117
All Particulate Sources						All Particulate Sources					
24-hour Max				55.31815	11.84661	Annual				5.84047	1.50974
1-hour NO2 w/ OLM	114.947		Max 1-Hr O3(ppm)	0.123		Annual NO2 w/ ARM	5.315	based on ARM Ratio of:		75%	
Background						Background					
1-hour Max	143.0	3680	102.2								
3-hour Max			49.4								
8-hour Max		2178									
24-hour Max			23.5	51.7	39.9	Annual	32.0		8.0	18.1	9.4
Total + Background						Total + Background					
1-hour Max	257.9	3730	124.8								
3-hour Max			68.7								
8-hour Max		2213									
24-hour Max			30.5	107	52	Annual	37.3		9.6	23.9	10.9

Table 3.1B-6 Standards Comparison for Russell City Energy Center Construction Impacts

Pollutant	Averaging Time	Impacts (ug/m3) Construction Only	Impacts (ug/m3) Construction+ Background	Standards (ug/m3) National	Standards (ug/m3) California	Construction Only % of Standards National	Construction Only % of Standards California	Construction+Background % of Standards National	Construction+Background % of Standards California
NOx	1-Hr	108.2	251.2	-	470	-	23%	-	53%
	Annual	5.3	37.3	100	-	5%	-	37%	-
CO	1-Hr	47	3727	40000	23000	0%	0%	9%	16%
	8-Hr	35	2213	10000	10000	0%	0%	22%	22%
SOx	1-Hr	21.3	123.5	-	655	-	3%	-	19%
	3-Hr	19.3	68.7	1300	-	1%	-	5%	-
	24-Hr	7.0	30.5	365	105	2%	7%	8%	29%
	Annual	1.6	9.6	80	-	2%	-	12%	-
PM10	24-Hr	2.3	54.0	150	50	2%	5%	36%	108%
Combustion	Annual	0.5	18.6	50	30	1%	2%	37%	62%
PM10	24-Hr	55.3	107.0	150	50	37%	111%	71%	214%
All Srcs	Annual	5.8	23.9	50	30	12%	19%	48%	80%
PM2.5	24-Hr	2.1	42.0	65	-	3%	-	65%	-
Combustion	Annual	0.5	9.9	15	12	3%	4%	66%	83%
PM2.5	24-Hr	11.8	51.7	65	-	18%	-	80%	-
All Srcs	Annual	1.5	10.9	15	12	10%	13%	73%	91%

Figure 3.1B-1
Facility Plot Plan
Russell City Energy Center
Immediate Vicinity

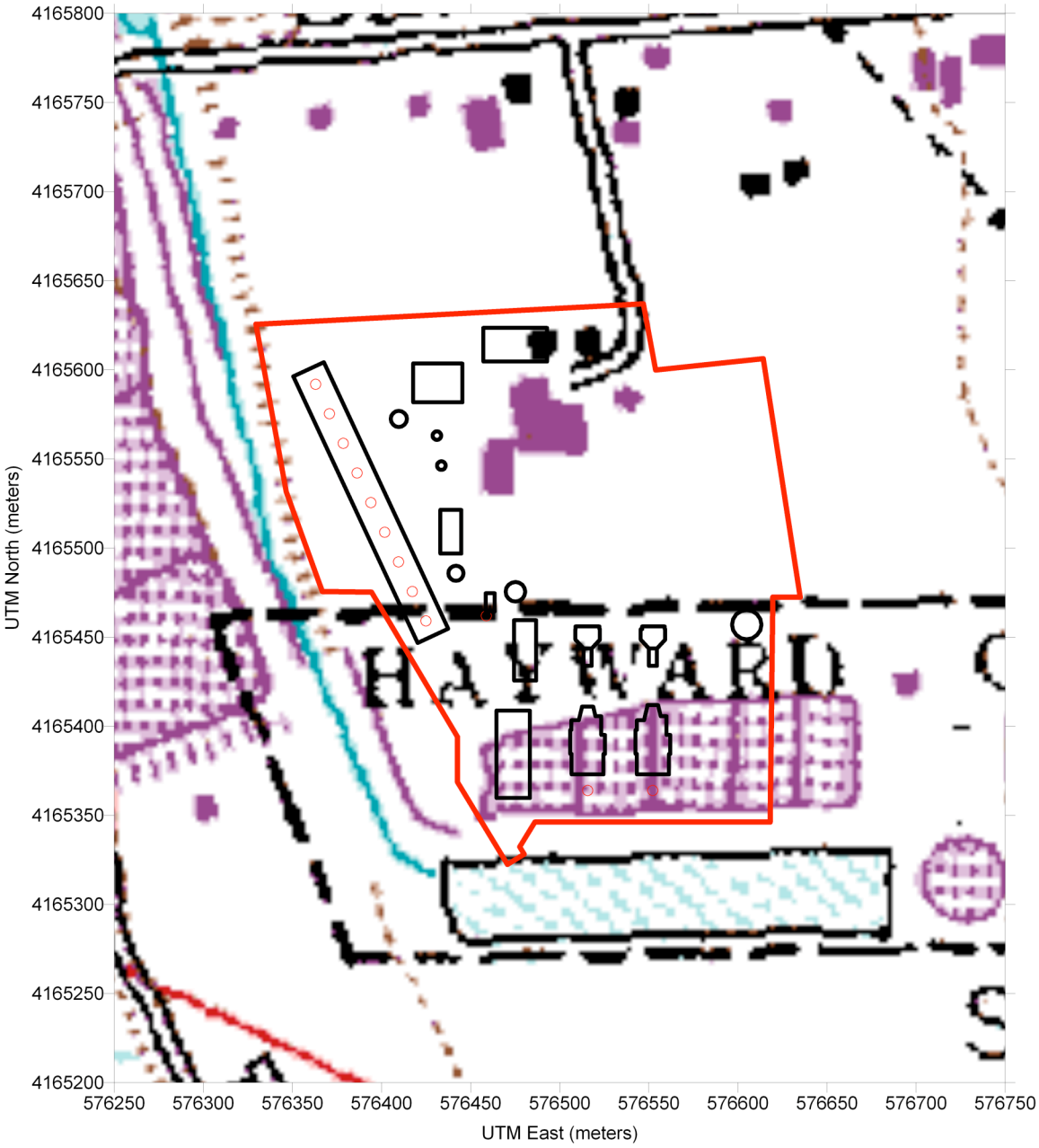
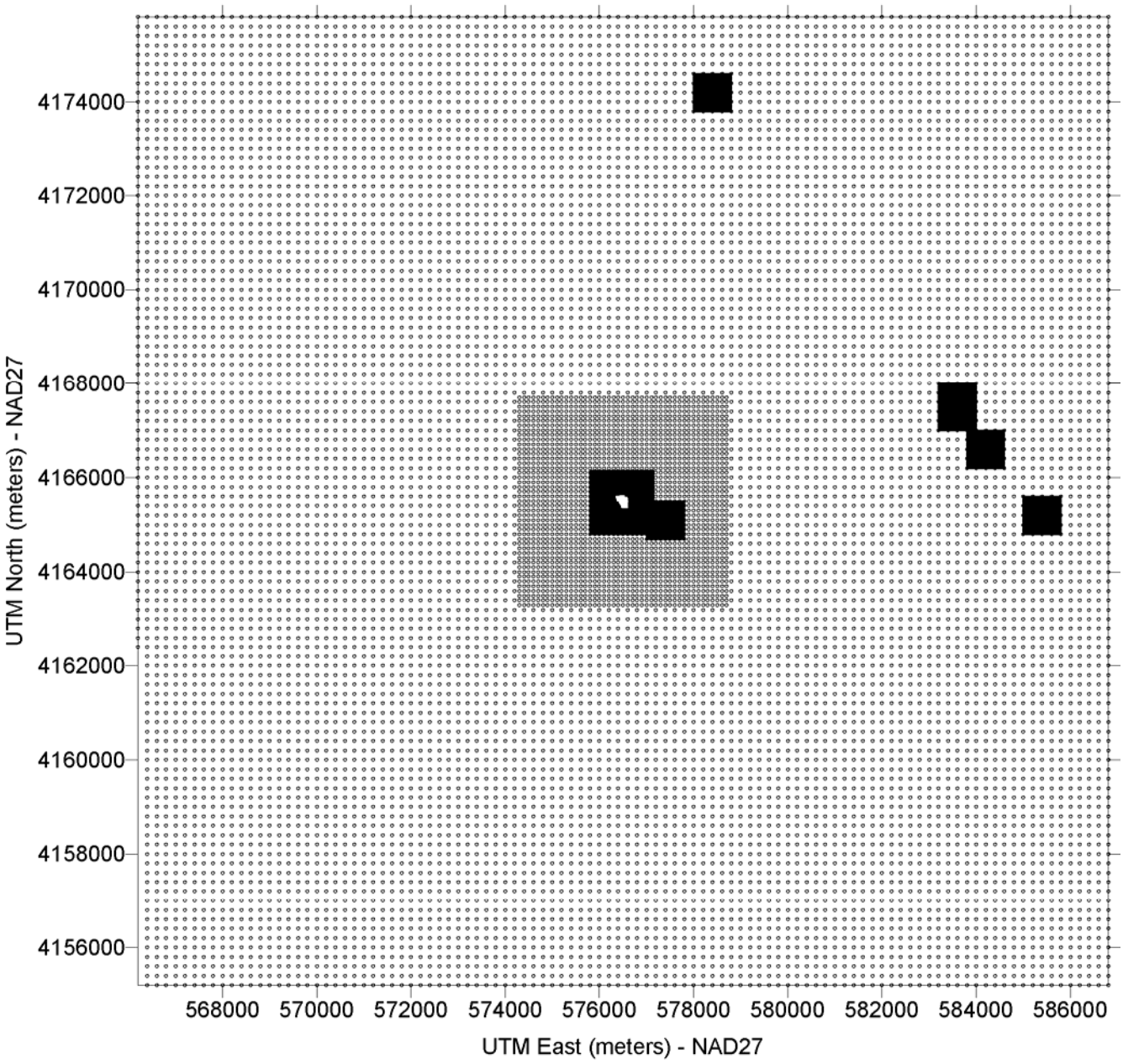


FIGURE 3.1-B2
Russell City Energy Center
ISCST3/ISC3OLM Receptor Grids



Receptor Grids include:
(a) Receptors spaced 10-meters or less along property fenceline;
(b) 10-meter spaced Downwash Grid within 500 meters of property fenceline;
(c) 100-meter spaced Intermediate Grid within 2 kilometers of property fenceline; and
(d) 200-meter spaced Coarse Grid within 10 kilometers of property fenceline.

Based on the modeling results for these receptor grids, additional 10-meter spaced Refined (Fine) Receptor Grids shown above were modeled as follows:
(a) Area in Intermediate Grid southeast of facility for annual PM10 maxima;
(b) Areas in Coarse Grid east of facility for annual NOx, 1-hr SO2, 3-hr SO2, and annual SO2 maxima for normal operations; 1-hr CO, 8-hr CO, and 1-hr NO2-OLM maxima for start-up conditions; and 1-hr CO and 8-hr CO maxima for commissioning; and
(c) Areas in Coarse Grid north of facility for 1-hr NO2-OLM maxima for commissioning.

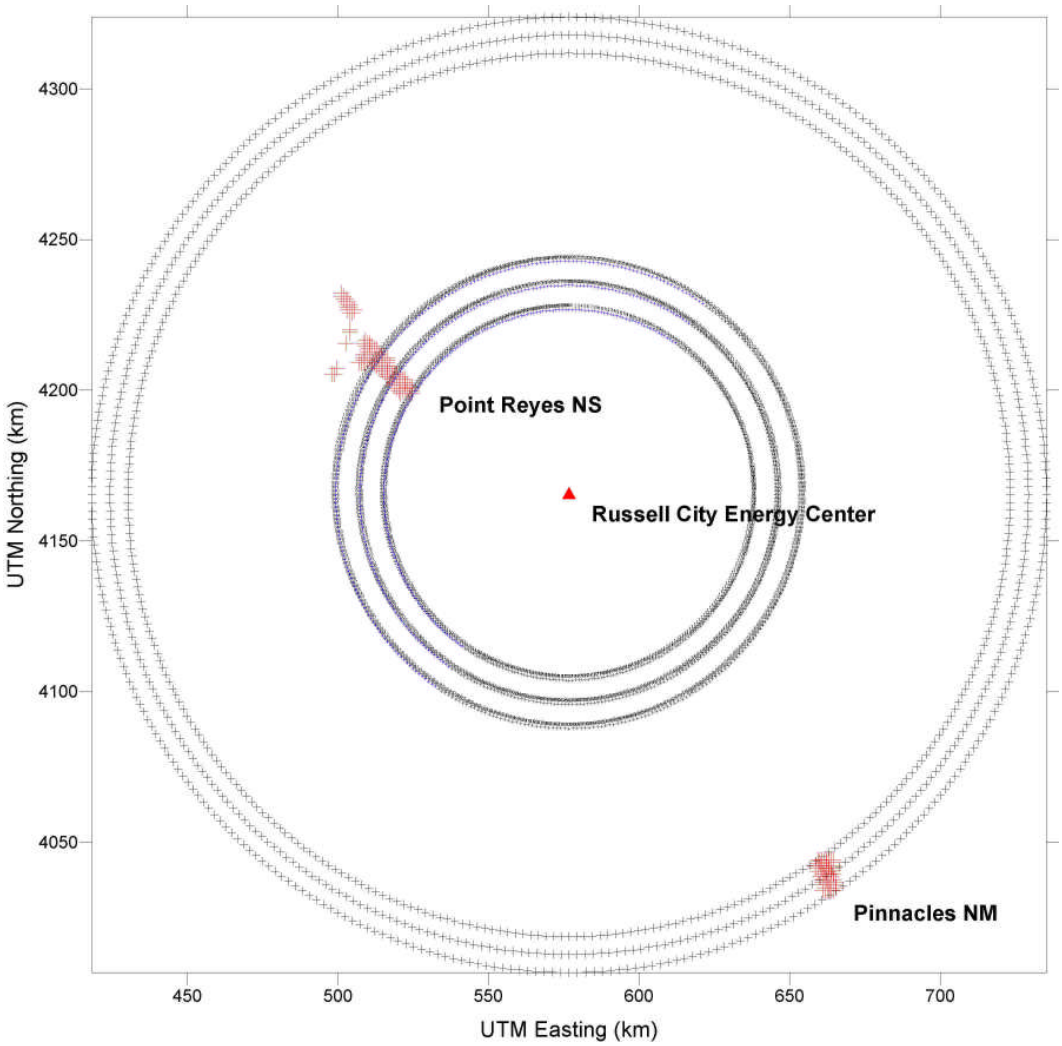



Figure 3.1B-3
Class I Receptor Location