Prepared Direct Testimony
Of
David Wieland

1. Q. Please state your name and employer.
   A. My name is David Wieland and I am a Principal Consultant with Wieland Associates, Inc.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center?
   A. My firm was engaged by POWER Engineers to perform a noise analysis for the construction and operation of the proposed RERC. My staff conducted various noise measurements with the sound level meters specified by the Applicant.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

Exh 1	Section 6.7	Noise
	Section 6.7	Appendix Riverside Energy Resource Center Estimated Noise Level Inquiry
Exh 9	Response 23-45	

4. Q. CEC Staff, in its Final Initial Study, discusses impacts from construction noise at pages 12-8 and 12-9. Do you have any comments on this discussion?
   A. Yes. The CEC Staff did a good analysis, but we have changed some of the modeling inputs. In response to comments, we have revised the construction noise model to conform to the types of equipment and equipment usage discussed in the analysis of air quality. We have also revised the noise model to consider the Happy Valley Kennel (with residence) at the northeast corner of Jurupa Avenue and Acorn Street. Lastly, we have revised the noise model to take into consideration the barrier effects that will be provided by the proposed 10'-high wall along the southerly and westerly property lines of the project, the berm that surrounds the project site, and the various commercial/industrial buildings in the area. Based on the revised noise model, the anticipated construction noise levels and impacts are summarized in the following table:

Measurement Site	Construction Noise Level	Measured Existing Ambient	Cumulative	Change
LT-1	51 dBA	57 dBA	58 dBA	1 dBA
LT-2	46 dBA	50 dBA	52 dBA	2 dBA
LT-3	41 dBA	48 dBA	49 dBA	1 dBA
ST-5	48 dBA	46 dBA	50 dBA	4 dBA
Kennel/Residence	49 dBA	63 dBA	63 dBA	0 dBA

The revised data and analysis are attached.

Since the anticipated increases are less than 5 dBA, the construction noise will not create a significant impact.

5. Q. CEC Staff, in its Final Initial Study, discusses impacts from operational noise starting at page 12-9. Do you have any comments on this discussion?

A. Yes. The CEC Staff did a good analysis, but we have changed some of the modeling inputs. We have revised the operations noise model to consider the relocated fuel gas compressor skid. In response to comments, we have also revised the noise model to consider the Happy Valley Kennel (with residence) at the northeast corner of Jurupa Avenue and Acorn Street. Lastly, we have revised the noise model to take into consideration the barrier effects that will be provided by the proposed 10'-high wall along the southerly and westerly property lines of the project, the berm that surrounds the project site, and the various commercial/industrial buildings in the area. Based on the revised noise model (which is attached), the anticipated operational noise levels and impacts are summarized in the following table:

Compliance with Noise Standards
(√ = Satisfied)

Location	City of Riverside	County of Riverside	CEC
LT-1	N/A	42 / 45 dB(A) √	√ by 3 dB
LT-2	37 / 45 dB(A) √	N/A	√ by 5 dB
LT-3	33 / 45 dB(A) √	N/A	√ by 3 dB
ST-1	N/A	N/A	√ by 5 dB
ST-2	N/A	32 / 45 dB(A) √	√ by 5 dB
ST-3	N/A	42 / 45 dB(A) √	√ by 3 dB
ST-4	37 / 45 dB(A) √	N/A	√ by 5 dB
ST-5	N/A	N/A	√ by 4 dB
ST-6	58 / 65 dB(A) √	N/A	N/A
ST-7	60 / 70 dB(A) √	N/A	N/A
ST-8	46 / 70 dB(A) √	N/A	N/A
ST-9	41 / 65 dB(A) √	N/A	√ by 5 dB
ST-10	37 / 45 dB(A) √	N/A	√ by 5 dB
ST-11	37 / 45 dB(A) √	N/A	√ by 5 dB
ST-12	38 / 45 dB(A) √	N/A	√ by 5 dB
Kennel/ Residence	43 / 45 dB(A) √	N/A	√ by 5 dB

Legend: Estimated project noise level / standard

N/A: Not applicable

The revised analysis indicates that the proposed RERC, as designed, is expected to comply with local regulations, and is not expected to either increase ambient noise levels by 5 dB at a noise-sensitive receptor, or produce a significant impact.

6. Q. Does that complete your direct testimony?
   A. Yes, it does.

Riverside Energy Resource Center

Sound Level Calculation

Nearest Residential Property: 3,000 Feet North of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	4000	8000
Receptor Location	3,000		61.3	56.3	49.7	45.2	38.9	32.4	27.1	10.1	-13.2
		41.5	21.9	30.1	33.6	36.6	35.7	32.4	28.3	11.1	-14.3
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,000	36.5	61.0	55.4	47.4	40.3	30.5	21.9	12.3	-1.9	-25.2
Ammonia Evaporation Skid	3,000	30.8	40.0	39.4	38.4	35.3	29.5	20.9	8.3	-11.9	-38.2
Chiller Package	3,000	24.7	21.9	21.4	19.4	24.3	22.5	19.9	17.3	0.1	-35.2
Auxiliary Cooling Tower	3,000	33.8	42.9	42.4	42.4	39.3	31.5	19.9	9.3	-8.9	-31.2
Fuel Gas Compressor Skid	3,000	37.2	47.9	47.0	40.5	39.5	35.9	30.7	26.2	9.2	-13.7
Tempering Air Fans	3,000	26.9	41.0	38.4	35.4	30.3	24.5	19.9	5.3	-14.9	-36.2
Distance to acoustic center	**3,000**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,000										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			67	67	67	67	67	67	67	67	67
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	4	5	9	16	32	53
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**37**	**61**	**55**	**47**	**40**	**30**	**22**	**12**	**-2**	**-25**
Ammonia Evaporation Skid	3,000										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			67	67	67	67	67	67	67	67	67
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	4	5	9	16	32	53
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**31**	**40**	**39**	**38**	**35**	**29**	**21**	**8**	**-12**	**-38**
Chiller Package	3,000										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			67	67	67	67	67	67	67	67	67
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	4	5	9	16	32	53
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**25**	**22**	**21**	**19**	**24**	**22**	**20**	**17**	**0**	**-35**
Auxiliary Cooling Tower	3,000										

Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			67	67	67	67	67	67	67	67	67
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	4	5	9	16	32	53
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**34**	**43**	**42**	**42**	**39**	**31**	**20**	**9**	**-9**	**-31**
Fuel Gas Compressor Skid	3,000										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			67	67	67	67	67	67	67	67	67
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	4	5	9	16	32	53
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**37**	**48**	**47**	**40**	**40**	**36**	**31**	**26**	**9**	**-14**
Tempering Air Fans	3,000										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			67	67	67	67	67	67	67	67	67
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	4	5	9	16	32	53
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**27**	**41**	**38**	**35**	**30**	**24**	**20**	**5**	**-15**	**-36**

Riverside Energy Resource Center

Sound Level Calculation

Nearest Residential Property: 4,055 Feet Southwest of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	4000	8000
Receptor Location	4,055		58.4	53.2	46.2	41.3	34.4	26.7	19.0	-3.6	-34.5
		37.3	19.0	27.0	30.1	32.7	31.2	26.7	20.2	-2.6	-35.6
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	4,055	32.8	58.0	52.3	43.9	36.4	26.0	16.1	4.2	-15.6	-46.4
Ammonia Evaporation Skid	4,055	26.7	37.0	36.3	34.9	31.4	25.0	15.1	0.2	-25.6	-59.4
Chiller Package	4,055	19.2	19.0	18.3	15.9	20.4	17.9	14.1	9.2	-13.6	-56.4
Auxiliary Cooling Tower	4,055	29.8	40.0	39.3	38.9	35.4	26.9	14.1	1.2	-22.6	-52.4
Fuel Gas Compressor Skid	4,055	32.4	44.9	43.9	37.0	35.6	31.4	24.9	18.1	-4.5	-34.9
Tempering Air Fans	4,055	22.6	38.0	35.3	31.9	26.4	20.0	14.1	-2.8	-28.6	-57.4
Distance to acoustic center	**4,055**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	4,055										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	12	21	43	72
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**33**	**58**	**52**	**44**	**36**	**26**	**16**	**4**	**-16**	**-46**
Ammonia Evaporation Skid	4,055										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	12	21	43	72
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**27**	**37**	**36**	**35**	**31**	**25**	**15**	**0**	**-26**	**-59**
Chiller Package	4,055										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	12	21	43	72
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**19**	**19**	**18**	**16**	**20**	**18**	**14**	**9**	**-14**	**-56**
Auxiliary Cooling Tower	4,055										

Riverside Energy Resource Center

Sound Level Calculation

Nearest Residential Property: 4,200 Feet Southeast of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	4000	8000
Receptor Location	4,200		58.0	52.8	45.8	40.8	33.8	25.9	17.9	-5.5	-37.4
		36.8	18.6	26.6	29.7	32.2	30.6	25.9	19.1	-4.5	-38.5
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	4,200	32.4	57.7	51.9	43.5	36.0	25.4	15.4	3.2	-17.5	-49.3
Ammonia Evaporation Skid	4,200	26.1	36.7	35.9	34.5	31.0	24.4	14.4	-0.8	-27.5	-62.3
Chiller Package	4,200	18.5	18.7	17.9	15.5	19.9	17.4	13.4	8.2	-15.5	-59.3
Auxiliary Cooling Tower	4,200	29.3	39.7	38.9	38.5	34.9	26.4	13.4	0.2	-24.5	-55.3
Fuel Gas Compressor Skid	4,200	31.8	44.6	43.5	36.6	35.2	30.8	24.2	17.1	-6.4	-37.8
Tempering Air Fans	4,200	22.1	37.7	34.9	31.5	26.0	19.4	13.4	-3.8	-30.5	-60.3
Distance to acoustic center	**4,200**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	4,200										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	8	13	22	44	74
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**32**	**58**	**52**	**43**	**36**	**25**	**15**	**3**	**-17**	**-49**
Ammonia Evaporation Skid	4,200										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	8	13	22	44	74
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**26**	**37**	**36**	**34**	**31**	**24**	**14**	**-1**	**-27**	**-62**
Chiller Package	4,200										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	8	13	22	44	74
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**19**	**19**	**18**	**15**	**20**	**17**	**13**	**8**	**-15**	**-59**
Auxiliary Cooling Tower	4,200										

Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	8	13	22	44	74
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**29**	**40**	**39**	**38**	**35**	**26**	**13**	**0**	**-24**	**-55**
Fuel Gas Compressor Skid	4,200										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	8	13	22	44	74
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**32**	**45**	**43**	**37**	**35**	**31**	**24**	**17**	**-6**	**-38**
Tempering Air Fans	4,200										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	8	13	22	44	74
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**22**	**38**	**35**	**31**	**26**	**19**	**13**	**-4**	**-30**	**-60**

Riverside Energy Resource Center

Sound Level Calculation

Nearest Residential Property: 3,840 Feet South of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	3840	8000
Receptor Location	3,840		58.9	53.8	46.9	42.0	35.2	27.8	20.6	-0.9	-30.2
		38.1	19.5	27.6	30.8	33.4	32.0	27.8	21.8	0.1	-31.3
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,840	33.5	58.6	52.9	44.6	37.2	26.8	17.3	5.8	-12.9	-42.2
Ammonia Evaporation Skid	3,840	27.4	37.6	36.9	35.6	32.2	25.8	16.3	1.8	-22.9	-55.2
Chiller Package	3,840	20.2	19.5	18.8	16.6	21.1	18.8	15.2	10.8	-10.9	-52.2
Auxiliary Cooling Tower	3,840	30.6	40.5	39.8	39.6	36.1	27.8	15.2	2.8	-19.9	-48.2
Fuel Gas Compressor Skid	3,840	33.3	45.5	44.5	37.7	36.4	32.2	26.1	19.7	-1.8	-30.7
Tempering Air Fans	3,840	23.4	38.6	35.9	32.6	27.2	20.8	15.3	-1.2	-25.9	-53.2
Distance to acoustic center	**3,840**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,840										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	11	20	41	68
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**34**	**59**	**53**	**45**	**37**	**27**	**17**	**6**	**-13**	**-42**
Ammonia Evaporation Skid	3,840										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	11	20	41	68
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**27**	**38**	**37**	**36**	**32**	**26**	**16**	**2**	**-23**	**-55**
Chiller Package	3,840										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	11	20	41	68
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**20**	**20**	**19**	**17**	**21**	**19**	**15**	**11**	**-11**	**-52**
Auxiliary Cooling Tower	3,840										

Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	12	21	43	72
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**30**	**40**	**39**	**39**	**35**	**27**	**14**	**1**	**-23**	**-52**
Fuel Gas Compressor Skid	4,055										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	12	21	43	72
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**32**	**45**	**44**	**37**	**36**	**31**	**25**	**18**	**-5**	**-35**
Tempering Air Fans	4,055										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			70	70	70	70	70	70	70	70	70
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	12	21	43	72
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**23**	**38**	**35**	**32**	**26**	**20**	**14**	**-3**	**-29**	**-57**

Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	11	20	41	68
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**31**	**41**	**40**	**40**	**36**	**28**	**15**	**3**	**-20**	**-48**
Fuel Gas Compressor Skid	3,840										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	11	20	41	68
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**33**	**45**	**44**	**38**	**36**	**32**	**26**	**20**	**-2**	**-31**
Tempering Air Fans	3,840										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	5	7	11	20	41	68
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**23**	**39**	**36**	**33**	**27**	**21**	**15**	**-1**	**-26**	**-53**

Riverside Energy Resource Center

Sound Level Calculation

Nearest Residential Property: 5,550 Feet Southeast of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	4000	8000
Receptor Location	5,550		55.2	49.8	42.3	36.8	28.9	19.5	8.5	-22.2	-63.7
		32.6	15.8	23.6	26.2	28.2	25.7	19.5	9.7	-21.2	-64.8
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	5,550	28.7	54.8	48.8	40.0	31.9	20.5	8.9	-6.2	-34.2	-75.6
Ammonia Evaporation Skid	5,550	21.8	33.8	32.8	31.0	26.9	19.5	7.9	-10.2	-44.2	-88.6
Chiller Package	5,550	13.1	15.8	14.8	11.9	15.9	12.5	6.9	-1.2	-32.2	-85.6
Auxiliary Cooling Tower	5,550	25.2	36.8	35.8	34.9	30.9	21.5	6.9	-9.2	-41.2	-81.6
Fuel Gas Compressor Skid	5,550	27.1	41.7	40.4	33.1	31.1	25.9	17.7	7.7	-23.1	-64.1
Tempering Air Fans	5,550	17.7	34.8	31.8	28.0	21.9	14.5	6.9	-13.2	-47.2	-86.6
Distance to acoustic center	**5,550**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	5,550										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			72	72	72	72	72	72	72	72	72
Atmospheric Absorption (59 deg F, 70% RH)			2	3	5	7	10	17	29	59	98
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**29**	**55**	**49**	**40**	**32**	**21**	**9**	**-6**	**-34**	**-76**
Ammonia Evaporation Skid	5,550										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			72	72	72	72	72	72	72	72	72
Atmospheric Absorption (59 deg F, 70% RH)			2	3	5	7	10	17	29	59	98
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**22**	**34**	**33**	**31**	**27**	**20**	**8**	**-10**	**-44**	**-89**
Chiller Package	5,550										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			72	72	72	72	72	72	72	72	72
Atmospheric Absorption (59 deg F, 70% RH)			2	3	5	7	10	17	29	59	98
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**13**	**16**	**15**	**12**	**16**	**13**	**7**	**-1**	**-32**	**-86**
Auxiliary Cooling Tower	5,550										

Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			72	72	72	72	72	72	72	72	72
Atmospheric Absorption (59 deg F, 70% RH)			2	3	5	7	10	17	29	59	98
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**25**	**37**	**36**	**35**	**31**	**22**	**7**	**-9**	**-41**	**-82**
Fuel Gas Compressor Skid	5,550										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			72	72	72	72	72	72	72	72	72
Atmospheric Absorption (59 deg F, 70% RH)			2	3	5	7	10	17	29	59	98
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**27**	**42**	**40**	**33**	**31**	**26**	**18**	**8**	**-23**	**-64**
Tempering Air Fans	5,550										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			72	72	72	72	72	72	72	72	72
Atmospheric Absorption (59 deg F, 70% RH)			2	3	5	7	10	17	29	59	98
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**18**	**35**	**32**	**28**	**22**	**15**	**7**	**-13**	**-47**	**-87**

Riverside Energy Resource Center

Sound Level Calculation

Nearest Park Property: 3,390 Feet North of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	3390	8000
Receptor Location	3,390		55.1	50.1	43.1	37.6	29.6	20.3	11.7	-9.9	-38.5
		33.3	15.7	23.9	27.0	29.0	26.4	20.3	12.9	-8.9	-39.6
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,390	29.5	54.8	49.2	41.0	32.8	21.7	10.7	-1.8	-20.0	-49.1
Ammonia Evaporation Skid	3,390	21.9	33.8	33.2	31.0	26.8	19.7	8.7	-6.8	-31.0	-64.1
Chiller Package	3,390	14.5	15.8	15.1	13.0	16.8	13.7	8.7	3.2	-18.1	-59.1
Auxiliary Cooling Tower	3,390	27.2	36.8	36.1	36.0	32.8	24.7	12.7	1.2	-19.1	-44.1
Fuel Gas Compressor Skid	3,390	26.8	41.7	40.8	33.1	31.0	25.1	17.5	10.1	-11.9	-40.6
Tempering Air Fans	3,390	17.8	34.8	32.2	28.0	21.8	14.7	7.7	-9.8	-34.0	-62.1
Distance to acoustic center	**3,390**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,390										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			68	68	68	68	68	68	68	68	68
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	6	10	18	36	60
Barrier Attenuation			5	5	5	6	7	9	11	13	16
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**29**	**55**	**49**	**41**	**33**	**22**	**11**	**-2**	**-20**	**-49**
Ammonia Evaporation Skid	3,390										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			68	68	68	68	68	68	68	68	68
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	6	10	18	36	60
Barrier Attenuation			5	5	6	7	8	10	12	14	18
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**22**	**34**	**33**	**31**	**27**	**20**	**9**	**-7**	**-31**	**-64**
Chiller Package	3,390										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			68	68	68	68	68	68	68	68	68
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	6	10	18	36	60
Barrier Attenuation			5	5	5	6	7	9	11	13	16
Directivity			0	0	0	0	0	0	0	0	0

Chiller Package, SPL		**15**	**16**	**15**	**13**	**17**	**14**	**9**	**3**	**-18**	**-59**
Auxiliary Cooling Tower	3,390										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			68	68	68	68	68	68	68	68	68
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	6	10	18	36	60
Barrier Attenuation			5	5	5	5	5	5	5	5	5
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**27**	**37**	**36**	**36**	**33**	**25**	**13**	**1**	**-19**	**-44**
Fuel Gas Compressor Skid	3,390										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			68	68	68	68	68	68	68	68	68
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	6	10	18	36	60
Barrier Attenuation			5	5	6	7	9	11	13	16	19
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**27**	**42**	**41**	**33**	**31**	**25**	**17**	**10**	**-12**	**-41**
Tempering Air Fans	3,390										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			68	68	68	68	68	68	68	68	68
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	6	10	18	36	60
Barrier Attenuation			5	5	6	7	8	10	12	14	18
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**18**	**35**	**32**	**28**	**22**	**15**	**8**	**-10**	**-34**	**-62**

Barrier Calculations

	CTG	Amm	Chiller	Cooling	Comp.	Fans
Source height, ft	742	8	14	45	14	9
Barrier height, ft	20	20	20	20	20	20
Receiver height, ft	5	5	5	5	5	5
Source elevation, ft.	0	727	728	728	718	727
Barrier elevation, ft	765	765	765	765	765	765
Receiver elevation, ft.	780	780	780	780	780	780
Distance, source to barrier, ft	3,050	3110	2990	2990	2770	3070
Distance, barrier to receiver, ft	320	340	330	330	340	350
Path length difference, ft	0.03	0.04	0.03	0.00	0.06	0.04
Sign	+	+	+	+	+	+

Riverside Energy Resource Center

Sound Level Calculation

Nearest School Property: 3,710 Feet North of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	3710	8000
Receptor Location	3,710		54.2	49.1	41.4	35.9	28.0	18.3	8.3	-15.1	-45.8
		31.7	14.8	22.9	25.3	27.3	24.8	18.3	9.5	-14.1	-46.9
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,710	27.7	53.9	48.2	39.0	30.6	19.4	7.9	-5.2	-26.2	-57.6
Ammonia Evaporation Skid	3,710	20.4	32.9	32.2	30.0	25.6	17.4	5.9	-10.2	-37.2	-71.6
Chiller Package	3,710	12.1	14.9	14.2	11.0	14.6	11.3	5.9	-0.2	-24.2	-67.6
Auxiliary Cooling Tower	3,710	26.0	35.9	35.2	35.0	31.6	23.3	10.9	-1.2	-23.2	-50.6
Fuel Gas Compressor Skid	3,710	25.0	40.8	39.8	31.1	28.8	23.8	15.7	6.7	-17.1	-48.1
Tempering Air Fans	3,710	16.3	33.9	31.2	27.0	20.6	12.4	4.9	-13.2	-40.2	-69.6
Distance to acoustic center	**3,710**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	3,710										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	7	11	19	39	66
Barrier Attenuation			5	5	6	7	8	10	12	15	18
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**28**	**54**	**48**	**39**	**31**	**19**	**8**	**-5**	**-26**	**-58**
Ammonia Evaporation Skid	3,710										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	7	11	19	39	66
Barrier Attenuation			5	5	6	7	9	11	13	16	19
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**20**	**33**	**32**	**30**	**26**	**17**	**6**	**-10**	**-37**	**-72**
Chiller Package	3,710										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	7	11	19	39	66
Barrier Attenuation			5	5	6	7	8	10	12	15	18
Directivity			0	0	0	0	0	0	0	0	0

Chiller Package, SPL		**12**	**15**	**14**	**11**	**15**	**11**	**6**	**0**	**-24**	**-68**
Auxiliary Cooling Tower	3,710										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	7	11	19	39	66
Barrier Attenuation			5	5	5	5	5	5	5	5	5
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**26**	**36**	**35**	**35**	**32**	**23**	**11**	**-1**	**-23**	**-51**
Fuel Gas Compressor Skid	3,710										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	7	11	19	39	66
Barrier Attenuation			5	5	7	8	9	11	14	17	20
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**25**	**41**	**40**	**31**	**29**	**24**	**16**	**7**	**-17**	**-48**
Tempering Air Fans	3,710										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			69	69	69	69	69	69	69	69	69
Atmospheric Absorption (59 deg F, 70% RH)			1	2	3	4	7	11	19	39	66
Barrier Attenuation			5	5	6	7	9	11	13	16	19
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**16**	**34**	**31**	**27**	**21**	**12**	**5**	**-13**	**-40**	**-70**

Barrier Calculations						
	CTG	Amm	Chiller	Cooling	Comp.	Fans
Source height, ft	742	8	14	45	14	9
Barrier height, ft	20	20	20	20	20	20
Receiver height, ft	5	5	5	5	5	5
Source elevation, ft.	0	727	728	728	718	727
Barrier elevation, ft	765	765	765	765	765	765
Receiver elevation, ft.	780	780	780	780	780	780
Distance, source to barrier, ft	3120	3120	3020	3020	2920	3100
Distance, barrier to receiver, ft	600	600	600	600	620	600
Path length difference, ft	0.05	0.06	0.05	0.00	0.08	0.06
Sign	+	+	+	+	+	+

Riverside Energy Resource Center

Sound Level Calculation

Nearest Church Property: 1,170 Feet Southeast of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	1170	8000
Receptor Location	1,170		61.0	54.7	49.2	45.4	38.5	29.6	24.4	16.6	6.8
		40.9	21.6	28.5	33.1	36.8	35.3	29.6	25.6	17.6	5.7
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	1,170	32.6	60.7	53.5	44.1	34.7	22.9	13.6	6.0	1.7	-8.6
Ammonia Evaporation Skid	1,170	23.8	38.7	36.5	33.1	28.7	20.9	11.6	2.0	-8.3	-21.6
Chiller Package	1,170	18.2	21.7	20.5	16.1	19.6	15.9	11.5	11.0	3.7	-18.6
Auxiliary Cooling Tower	1,170	39.7	46.7	46.5	47.1	44.6	37.9	28.5	22.0	13.7	4.4
Fuel Gas Compressor Skid	1,170	28.9	45.6	43.1	34.2	30.9	26.3	21.4	19.9	12.8	2.9
Tempering Air Fans	1,170	20.2	39.7	35.5	31.1	23.7	15.9	10.6	-1.0	-11.3	-19.6
Distance to acoustic center	**1,170**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	1,170										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			59	59	59	59	59	59	59	59	59
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	6	12	21
Barrier Attenuation			9	11	13	16	19	22	24	24	24
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**33**	**61**	**53**	**44**	**35**	**23**	**14**	**6**	**2**	**-9**
Ammonia Evaporation Skid	1,170										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			59	59	59	59	59	59	59	59	59
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	6	12	21
Barrier Attenuation			10	12	15	17	20	23	24	24	24
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**24**	**39**	**36**	**33**	**29**	**21**	**12**	**2**	**-8**	**-22**
Chiller Package	1,170										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			59	59	59	59	59	59	59	59	59
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	6	12	21
Barrier Attenuation			9	10	13	15	18	22	24	24	24
Directivity			0	0	0	0	0	0	0	0	0

Chiller Package, SPL		**18**	**22**	**20**	**16**	**20**	**16**	**12**	**11**	**4**	**-19**
Auxiliary Cooling Tower	1,170										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			59	59	59	59	59	59	59	59	59
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	6	12	21
Barrier Attenuation			5	5	5	5	5	5	5	5	5
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**40**	**47**	**46**	**47**	**45**	**38**	**29**	**22**	**14**	**4**
Fuel Gas Compressor Skid	1,170										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			59	59	59	59	59	59	59	59	59
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	6	12	21
Barrier Attenuation			11	13	16	19	21	23	24	24	24
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**29**	**46**	**43**	**34**	**31**	**26**	**21**	**20**	**13**	**3**
Tempering Air Fans	1,170										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			59	59	59	59	59	59	59	59	59
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	6	12	21
Barrier Attenuation			10	12	14	17	20	23	24	24	24
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**20**	**40**	**35**	**31**	**24**	**16**	**11**	**-1**	**-11**	**-20**

Barrier Calculations						
	CTG	Amm	Chiller	Cooling	Comp.	Fans
Source height, ft	742	8	14	45	14	9
Barrier height, ft	10	10	10	10	10	10
Receiver height, ft	5	5	5	5	5	5
Source elevation, ft.	0	727	728	728	718	727
Barrier elevation, ft	760	760	760	760	760	760
Receiver elevation, ft.	760	760	760	760	760	760
Distance, source to barrier, ft	260	270	290	290	250	270
Distance, barrier to receiver, ft	880	810	860	860	1210	810
Path length difference, ft	1.29	1.86	1.13	0.00	2.51	1.76
Sign	+	+	+	-	+	+

Riverside Energy Resource Center

Sound Level Calculation

Nearest Recreational Property: 910 Feet North of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	910	8000
Receptor Location	910		64.3	57.9	50.4	44.8	37.0	28.2	24.6	18.6	10.1
		40.8	24.9	31.7	34.3	36.2	33.8	28.2	25.8	19.6	9.0
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	910	36.1	64.0	56.8	47.5	38.1	27.6	18.5	10.5	6.6	-1.9
Ammonia Evaporation Skid	910	28.2	42.0	40.8	37.5	33.1	25.6	15.5	5.5	-3.4	-14.9
Chiller Package	910	21.8	23.9	22.8	18.5	22.1	18.6	15.5	15.5	8.6	-11.9
Auxiliary Cooling Tower	910	36.5	47.9	46.8	45.5	42.1	33.6	21.5	11.5	2.6	-6.9
Fuel Gas Compressor Skid	910	33.9	49.9	48.4	39.6	36.3	32.0	25.3	23.4	17.7	9.6
Tempering Air Fans	910	24.4	43.0	39.8	34.5	28.1	20.6	15.5	3.5	-6.4	-12.9
Distance to acoustic center	**910**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	910										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			57	57	57	57	57	57	57	57	57
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	10	16
Directivity			0	0	0	0	0	0	0	0	0
Barrier			8	10	12	15	17	20	23	24	24
CTG, SPL		**36**	**64**	**57**	**47**	**38**	**28**	**19**	**11**	**7**	**-2**
Ammonia Evaporation Skid	910										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			57	57	57	57	57	57	57	57	57
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	10	16
Directivity			0	0	0	0	0	0	0	0	0
Barrier			9	10	13	15	18	22	24	24	24
Ammonia Evaporation Skid, SPL		**28**	**42**	**41**	**37**	**33**	**26**	**16**	**6**	**-3**	**-15**
Chiller Package	910										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			57	57	57	57	57	57	57	57	57
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	10	16
Directivity			0	0	0	0	0	0	0	0	0
Barrier			9	10	13	15	18	21	23	24	24

Chiller Package, SPL		**22**	**24**	**23**	**18**	**22**	**19**	**16**	**16**	**9**	**-12**
Auxiliary Cooling Tower	910										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			57	57	57	57	57	57	57	57	57
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	10	16
Directivity			0	0	0	0	0	0	0	0	0
Barrier			6	7	9	10	12	15	19	21	23
Auxiliary Cooling Tower, SPL		**37**	**48**	**47**	**45**	**42**	**34**	**22**	**12**	**3**	**-7**
Fuel Gas Compressor Skid	910										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			57	57	57	57	57	57	57	57	57
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	10	16
Directivity			0	0	0	0	0	0	0	0	0
Barrier			9	10	13	16	18	22	24	24	24
Fuel Gas Compressor Skid, SPL		**34**	**50**	**48**	**40**	**36**	**32**	**25**	**23**	**18**	**10**
Tempering Air Fans	910										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			57	57	57	57	57	57	57	57	57
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	10	16
Directivity			0	0	0	0	0	0	0	0	0
Barrier			9	10	13	15	18	21	23	24	24
Tempering Air Fans, SPL		**24**	**43**	**40**	**34**	**28**	**21**	**16**	**4**	**-6**	**-13**

Barrier Calculations						
	CTG	Amm	Chiller	Cooling	Comp.	Fans
Source height, ft	742	8	14	45	14	9
Barrier height, ft	0	0	0	0	0	0
Receiver height, ft	5	5	5	5	5	5
Source elevation, ft.	0	727	728	728	718	727
Barrier elevation, ft	755	755	755	755	755	755
Receiver elevation, ft.	730	730	730	730	730	730
Distance, source to barrier, ft	680	680	580	580	580	630
Distance, barrier to receiver, ft	250	230	230	230	260	270
Path length difference, ft	0.90	1.16	0.98	0.26	1.22	1.03
Sign	+	+	+	+	+	+

Riverside Energy Resource Center

Sound Level Calculation

Nearest Industrial Property: 500 Feet South of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	1220	8000
Receptor Location	Varies		69.7	63.5	56.0	50.0	41.5	33.9	30.0	25.0	17.3
		46.1	30.3	37.3	39.9	41.4	38.3	33.9	31.2	26.0	16.2
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stk #1	440	40.1	67.4	60.3	51.2	43.0	31.7	23.2	16.3	14.9	9.8
CTG, CTG Auxiliary Skid, SCR, Exhaust Stk #2	560	38.6	65.3	59.2	50.0	40.8	30.4	21.8	14.5	12.5	5.5
Ammonia Evaporation Skid #1	455	32.9	46.1	44.0	41.9	37.7	30.4	21.9	11.9	4.4	-3.8
Ammonia Evaporation Skid #2	540	31.3	44.6	42.5	40.3	36.1	28.8	20.1	10.0	2.1	-6.8
Chiller Package	480	30.4	30.6	29.5	26.4	29.2	26.9	24.3	24.3	19.7	1.3
Auxiliary Cooling Tower	480	40.6	52.6	51.5	50.4	46.2	36.9	25.3	17.3	10.7	5.3
Fuel Gas Compressor Skid #1	710	34.9	50.1	47.6	39.9	37.7	32.5	27.1	24.6	19.0	12.3
Fuel Gas Compressor Skid #2	710	34.9	50.1	47.6	39.9	37.7	32.5	27.1	24.6	19.0	12.3
Tempering Air Fans #1	460	28.9	47.0	42.9	38.8	32.6	25.3	20.8	8.8	1.3	-2.0
Tempering Air Fans #2	540	27.4	45.6	41.5	37.3	31.1	23.8	19.1	7.0	-0.9	-4.8
Distance to acoustic center	**Near field**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack #1	440										
Standard Lw			126	121	114	108	100	95	92	94	92
Distance Correction			50	50	50	50	50	50	50	50	50
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	1	2	5	8
Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
CTG Unit #1, SPL		**40**	**67**	**60**	**51**	**43**	**32**	**23**	**16**	**15**	**10**
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack #2	560										
Standard Lw			126	121	114	108	100	95	92	94	92
Distance Correction			53	53	53	53	53	53	53	53	53
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	2	3	6	10
Barrier Attenuation			8	9	11	14	16	19	22	23	24
Directivity			0	0	0	0	0	0	0	0	0
CTG Unit #2, SPL		**39**	**65**	**59**	**50**	**41**	**30**	**22**	**15**	**13**	**6**
Ammonia Evaporation Skid #1	455										
Standard Lw			105	105	105	103	99	94	88	84	79

Distance Correction			51	51	51	51	51	51	51	51	51
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	1	2	5	8
Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid #1, SPL		**33**	**46**	**44**	**42**	**38**	**30**	**22**	**12**	**4**	**-4**
Ammonia Evaporation Skid #2	540										
Standard Lw			105	105	105	103	99	94	88	84	79
Distance Correction			52	52	52	52	52	52	52	52	52
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	2	3	6	10
Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid #2, SPL		**31**	**45**	**42**	**40**	**36**	**29**	**20**	**10**	**2**	**-7**
Chiller Package	480										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			51	51	51	51	51	51	51	51	51
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	1	2	5	8
Barrier Attenuation			8	9	11	14	16	19	22	23	24
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**30**	**31**	**30**	**26**	**29**	**27**	**24**	**24**	**20**	**1**
Auxiliary Cooling Tower	480										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			51	51	51	51	51	51	51	51	51
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	1	2	5	8
Barrier Attenuation			7	8	10	12	15	18	21	23	24
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**41**	**53**	**52**	**50**	**46**	**37**	**25**	**17**	**11**	**5**
Fuel Gas Compressor Skid #1	710										
Standard Lw			113	113	107	107	105	104	106	105	104
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid #1, SPL		**35**	**50**	**48**	**40**	**38**	**33**	**27**	**25**	**19**	**12**
Fuel Gas Compressor Skid #2	710										
Standard Lw			113	113	107	107	105	104	106	105	104
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13

Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid #2, SPL		**35**	**50**	**48**	**40**	**38**	**33**	**27**	**25**	**19**	**12**
Tempering Air Fans #1	460										
Standard Lw			106	104	102	98	94	93	85	81	81
Distance Correction			51	51	51	51	51	51	51	51	51
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	1	2	5	8
Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans #1, SPL		**29**	**47**	**43**	**39**	**33**	**25**	**21**	**9**	**1**	**-2**
Tempering Air Fans #2	540										
Standard Lw			106	104	102	98	94	93	85	81	81
Distance Correction			52	52	52	52	52	52	52	52	52
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	2	3	6	10
Barrier Attenuation			8	10	12	14	17	20	23	24	24
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans #2, SPL		**27**	**46**	**41**	**37**	**31**	**24**	**19**	**7**	**-1**	**-5**

Barrier Calculations										
	CTG1	CTG2	Amm1	Amm2	Chiller	Cooling	Comp1	Comp2	Fans1	Fans2
Source height, ft	743	741	8	8	14	45	14	14	9	9
Barrier height, ft	10	10	10	10	10	10	10	10	10	10
Receiver height, ft	5	5	5	5	5	5	5	5	5	5
Source elevation, ft.	0	0	728	726	728	728	718	718	728	726
Barrier elevation, ft	750	750	750	750	750	750	750	750	750	750
Receiver elevation, ft.	750	750	750	750	750	750	750	750	750	750
Distance, source to barrier, ft	430	550	450	570	600	600	700	700	440	570
Distance, barrier to receiver, ft	20	20	20	20	20	20	20	20	20	20
Path length difference, ft	0.79	0.77	0.87	0.83	0.75	0.50	0.81	0.81	0.86	0.82
Sign	+	+	+	+	+	+	+	+	+	+

Riverside Energy Resource Center

Sound Level Calculation

Nearest Industrial Property: 700 Feet East of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	1220	8000
Receptor Location	Varies		69.8	65.4	60.9	57.4	50.9	43.6	39.7	33.2	25.6
		53.3	30.4	39.2	44.8	48.8	47.7	43.6	40.9	34.2	24.5
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stk #1	670	44.1	66.7	61.6	54.3	48.1	38.7	31.9	26.4	22.8	14.0
CTG, CTG Auxiliary Skid, SCR, Exhaust Stk #2	720	42.7	66.0	60.9	53.7	46.4	37.0	29.1	22.5	18.6	8.5
Ammonia Evaporation Skid #1	630	35.1	45.2	45.1	42.9	39.7	33.3	25.5	14.2	3.8	-8.7
Ammonia Evaporation Skid #2	650	33.7	45.0	43.8	41.6	38.4	32.0	23.2	11.8	2.3	-9.3
Chiller Package	620	35.6	31.4	31.2	29.0	33.8	31.4	29.7	30.3	23.0	1.6
Auxiliary Cooling Tower	620	51.1	57.4	57.2	58.0	55.8	49.4	40.7	35.3	30.0	24.6
Fuel Gas Compressor Skid #1	1,000	41.3	50.0	49.5	43.7	42.4	39.0	35.2	33.1	24.9	13.2
Fuel Gas Compressor Skid #2	1,000	41.3	50.0	49.5	43.7	42.4	39.0	35.2	33.1	24.9	13.2
Tempering Air Fans #1	680	30.5	45.6	43.4	39.2	34.0	27.5	23.7	10.2	-0.4	-8.3
Tempering Air Fans #2	710	31.1	46.2	43.0	39.8	34.5	28.1	24.3	11.7	0.9	-7.2
Distance to acoustic center	**Near field**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack #1	670										
Standard Lw			126	121	114	108	100	95	92	94	92
Distance Correction			54	54	54	54	54	54	54	54	54
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	3	7	12
Barrier Attenuation			5	5	5	5	6	7	8	10	12
Directivity			0	0	0	0	0	0	0	0	0
CTG Unit #1, SPL		**44**	**67**	**62**	**54**	**48**	**39**	**32**	**26**	**23**	**14**
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack #2	720										
Standard Lw			126	121	114	108	100	95	92	94	92
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			5	5	5	6	7	9	11	13	16
Directivity			0	0	0	0	0	0	0	0	0
CTG Unit #2, SPL		**43**	**66**	**61**	**54**	**46**	**37**	**29**	**23**	**19**	**9**
Ammonia Evaporation Skid #1	630										
Standard Lw			105	105	105	103	99	94	88	84	79

Distance Correction			54	54	54	54	54	54	54	54	54
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	3	7	11
Barrier Attenuation			6	6	8	9	11	13	17	20	23
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid #1, SPL		**35**	**45**	**45**	**43**	**40**	**33**	**26**	**14**	**4**	**-9**
Ammonia Evaporation Skid #2	650										
Standard Lw			105	105	105	103	99	94	88	84	79
Distance Correction			54	54	54	54	54	54	54	54	54
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	3	7	11
Barrier Attenuation			6	7	9	10	12	15	19	21	23
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid #2, SPL		**34**	**45**	**44**	**42**	**38**	**32**	**23**	**12**	**2**	**-9**
Chiller Package	620										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			53	53	53	53	53	53	53	53	53
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	3	7	11
Barrier Attenuation			5	5	6	7	9	11	13	16	19
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**36**	**31**	**31**	**29**	**34**	**31**	**30**	**30**	**23**	**2**
Auxiliary Cooling Tower	620										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			53	53	53	53	53	53	53	53	53
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	3	7	11
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**51**	**57**	**57**	**58**	**56**	**49**	**41**	**35**	**30**	**25**
Fuel Gas Compressor Skid #1	1,000										
Standard Lw			113	113	107	107	105	104	106	105	104
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	11	18
Barrier Attenuation			5	5	5	6	7	8	10	12	15
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid #1, SPL		**41**	**50**	**50**	**44**	**42**	**39**	**35**	**33**	**25**	**13**
Fuel Gas Compressor Skid #2	1,000										
Standard Lw			113	113	107	107	105	104	106	105	104
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	2	3	5	11	18

Barrier Attenuation			5	5	5	6	7	8	10	12	15
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid #2, SPL		**41**	**50**	**50**	**44**	**42**	**39**	**35**	**33**	**25**	**13**
Tempering Air Fans #1	680										
Standard Lw			106	104	102	98	94	93	85	81	81
Distance Correction			54	54	54	54	54	54	54	54	54
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	7	12
Barrier Attenuation			6	6	8	9	11	13	17	20	23
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans #1, SPL		**31**	**46**	**43**	**39**	**34**	**28**	**24**	**10**	**0**	**-8**
Tempering Air Fans #2	710										
Standard Lw			106	104	102	98	94	93	85	81	81
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			5	6	7	8	10	12	15	18	21
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans #2, SPL		**31**	**46**	**43**	**40**	**35**	**28**	**24**	**12**	**1**	**-7**

Barrier Calculations										
	CTG1	CTG2	Amm1	Amm2	Chiller	Cooling	Comp1	Comp2	Fans1	Fans2
Source height, ft	743	741	8	8	14	45	14	14	9	9
Barrier height, ft	0	0	0	0	0	0	0	0	0	0
Receiver height, ft	5	5	5	5	5	5	5	5	5	5
Source elevation, ft.	0	0	728	726	728	728	718	718	728	726
Barrier elevation, ft	755	755	755	755	755	755	755	755	755	755
Receiver elevation, ft.	760	760	760	760	760	760	760	760	760	760
Distance, source to barrier, ft	300	320	250	270	260	260	610	610	250	340
Distance, barrier to receiver, ft	370	390	390	410	430	430	410	410	380	400
Path length difference, ft	0.01	0.03	0.19	0.23	0.06	0.69	0.02	0.02	0.16	0.10
Sign	+	+	+	+	+	-	+	+	+	+

Riverside Energy Resource Center

Sound Level Calculation

Nearest Office Property: 710 Feet West of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	1220	8000
Receptor Location	Varies		73.9	69.2	63.1	58.9	53.6	49.9	49.7	45.9	40.0
		57.5	34.5	42.9	46.9	50.2	50.3	49.7	50.9	46.8	38.9
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stk #1	760	48.3	70.6	65.4	58.2	51.9	43.4	37.5	32.9	30.8	23.4
CTG, CTG Auxiliary Skid, SCR, Exhaust Stk #2	750	48.4	70.7	65.5	58.3	52.0	43.6	37.7	33.0	31.0	23.7
Ammonia Evaporation Skid #1	800	43.1	49.1	49.0	48.7	46.4	41.9	36.0	28.2	19.9	9.2
Ammonia Evaporation Skid #2	800	38.1	44.1	44.0	43.7	41.4	36.9	31.0	23.2	14.9	4.2
Chiller Package	830	44.0	33.8	33.6	32.3	38.0	37.5	37.5	39.7	34.2	14.3
Auxiliary Cooling Tower	830	48.2	54.8	54.6	55.3	53.0	46.5	37.5	31.7	25.2	18.3
Fuel Gas Compressor Skid #1	540	51.7	55.5	55.1	49.4	49.3	47.2	44.9	45.9	42.2	36.7
Fuel Gas Compressor Skid #2	540	51.7	55.5	55.1	49.4	49.3	47.2	44.9	45.9	42.2	36.7
Tempering Air Fans #1	760	40.1	50.6	48.4	46.2	41.9	37.4	35.5	25.9	17.8	12.4
Tempering Air Fans #2	760	40.1	50.6	48.4	46.2	41.9	37.4	35.5	25.9	17.8	12.4
Distance to acoustic center	**Near field**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack #1	760										
Standard Lw			126	121	114	108	100	95	92	94	92
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
CTG Unit #1, SPL		**48**	**71**	**65**	**58**	**52**	**43**	**38**	**33**	**31**	**23**
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack #2	750										
Standard Lw			126	121	114	108	100	95	92	94	92
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
CTG Unit #2, SPL		**48**	**71**	**66**	**58**	**52**	**44**	**38**	**33**	**31**	**24**
Ammonia Evaporation Skid #1	800										
Standard Lw			105	105	105	103	99	94	88	84	79

Distance Correction			56	56	56	56	56	56	56	56	56
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	14
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid #1, SPL		**43**	**49**	**49**	**49**	**46**	**42**	**36**	**28**	**20**	**9**
Ammonia Evaporation Skid #2	800										
Standard Lw			105	105	105	103	99	94	88	84	79
Distance Correction			56	56	56	56	56	56	56	56	56
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	14
Barrier Attenuation			5	5	5	5	5	5	5	5	5
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid #2, SPL		**38**	**44**	**44**	**44**	**41**	**37**	**31**	**23**	**15**	**4**
Chiller Package	830										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			56	56	56	56	56	56	56	56	56
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	9	15
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**44**	**34**	**34**	**32**	**38**	**38**	**38**	**40**	**34**	**14**
Auxiliary Cooling Tower	830										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			56	56	56	56	56	56	56	56	56
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	9	15
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**48**	**55**	**55**	**55**	**53**	**47**	**38**	**32**	**25**	**18**
Fuel Gas Compressor Skid #1	540										
Standard Lw			113	113	107	107	105	104	106	105	104
Distance Correction			52	52	52	52	52	52	52	52	52
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	2	3	6	10
14' Sound-Absorptive Barrier			5	5	5	5	5	5	5	5	5
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid #1, SPL		**52**	**55**	**55**	**49**	**49**	**47**	**45**	**46**	**42**	**37**
Fuel Gas Compressor Skid #2	540										
Standard Lw			113	113	107	107	105	104	106	105	104
Distance Correction			52	52	52	52	52	52	52	52	52
Atmospheric Absorption (59 deg F, 70% RH)			0	0	0	1	1	2	3	6	10

14' Sound-Absorptive Barrier			5	5	5	5	5	5	5	5	5
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid #2, SPL		**52**	**55**	**55**	**49**	**49**	**47**	**45**	**46**	**42**	**37**
Tempering Air Fans #1	760										
Standard Lw			106	104	102	98	94	93	85	81	81
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans #1, SPL		**40**	**51**	**48**	**46**	**42**	**37**	**36**	**26**	**18**	**12**
Tempering Air Fans #2	760										
Standard Lw			106	104	102	98	94	93	85	81	81
Distance Correction			55	55	55	55	55	55	55	55	55
Atmospheric Absorption (59 deg F, 70% RH)			0	0	1	1	1	2	4	8	13
Barrier Attenuation			0	0	0	0	0	0	0	0	0
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans #2, SPL		**40**	**51**	**48**	**46**	**42**	**37**	**36**	**26**	**18**	**12**

Barrier Calculations										
	CTG1	CTG2	Amm1	Amm2	Chiller	Cooling	Comp1	Comp2	Fans1	Fans2
Source height, ft	743	741	8	8	14	45	14	14	9	9
Barrier height, ft	10	10	10	10	10	10	14	14	10	10
Receiver height, ft	5	5	5	5	5	5	5	5	5	5
Source elevation, ft.	0	0	728	726	728	728	718	718	728	726
Barrier elevation, ft	720	720	720	720	720	720	718	718	720	720
Receiver elevation, ft.	720	720	720	720	720	720	720	720	720	720
Distance, source to barrier, ft	310	300	360	370	380	380	10	10	300	330
Distance, barrier to receiver, ft	440	440	440	430	440	440	430	430	440	430
Path length difference, ft	0.08	0.06	0.00	0.00	0.04	1.05	0.00	0.00	0.01	0.00
Sign	-	-	-	+	-	-	+	+	-	-

Riverside Energy Resource Center

Sound Level Calculation

Nearest Industrial Property: 2,420 Feet North of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	1220	8000
Receptor Location	2,420		63.3	58.5	52.1	47.7	41.8	36.0	31.9	18.1	-1.1
		44.4	23.9	32.3	36.0	39.1	38.6	36.0	33.1	19.1	-2.2
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	2,420	39.1	63.0	57.6	49.7	42.9	33.4	25.5	17.2	6.1	-13.0
Ammonia Evaporation Skid	2,420	33.6	42.0	41.6	40.7	37.9	32.4	24.5	13.2	-3.9	-26.0
Chiller Package	2,420	28.4	24.0	23.5	21.7	26.8	25.4	23.5	22.2	8.1	-23.1
Auxiliary Cooling Tower	2,420	36.5	45.0	44.5	44.7	41.8	34.4	23.5	14.2	-0.9	-19.1
Fuel Gas Compressor Skid	2,420	40.4	49.9	49.2	42.8	42.1	38.8	34.3	31.1	17.2	-1.5
Tempering Air Fans	2,420	29.7	43.0	40.6	37.7	32.9	27.4	23.5	10.2	-6.9	-24.0
Distance to acoustic center	**2,420**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	2,420										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			65	65	65	65	65	65	65	65	65
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	3	4	7	13	26	43
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**39**	**63**	**58**	**50**	**43**	**33**	**26**	**17**	**6**	**-13**
Ammonia Evaporation Skid	2,420										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			65	65	65	65	65	65	65	65	65
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	3	4	7	13	26	43
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**34**	**42**	**42**	**41**	**38**	**32**	**25**	**13**	**-4**	**-26**
Chiller Package	2,420										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			65	65	65	65	65	65	65	65	65
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	3	4	7	13	26	43
Directivity			0	0	0	0	0	0	0	0	0
Chiller Package, SPL		**28**	**24**	**24**	**22**	**27**	**25**	**23**	**22**	**8**	**-23**
Auxiliary Cooling Tower	2,420										

Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			65	65	65	65	65	65	65	65	65
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	3	4	7	13	26	43
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**37**	**45**	**45**	**45**	**42**	**34**	**23**	**14**	**-1**	**-19**
Fuel Gas Compressor Skid	2,420										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			65	65	65	65	65	65	65	65	65
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	3	4	7	13	26	43
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**40**	**50**	**49**	**43**	**42**	**39**	**34**	**31**	**17**	**-2**
Tempering Air Fans	2,420										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			65	65	65	65	65	65	65	65	65
Atmospheric Absorption (59 deg F, 70% RH)			1	1	2	3	4	7	13	26	43
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**30**	**43**	**41**	**38**	**33**	**27**	**24**	**10**	**-7**	**-24**

Riverside Energy Resource Center

Sound Level Calculation

Nearest Kennel/Residential Property: 1,060 Feet South of Nominal Acoustic Center

	Distance (feet)	dBA	OCTAVE BAND CENTER FREQUENCY (Hz)								
			31.5	63	125	250	500	1000	2000	4000	8000
Receptor Location	1,060		64.9	59.4	52.1	47.5	40.1	32.6	27.5	18.8	7.2
		43.4	25.5	33.2	36.0	38.9	36.9	32.6	28.7	19.8	6.1
Summary											
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	1,060	38.3	64.6	58.4	49.0	41.6	31.0	21.7	12.4	6.7	-4.8
Ammonia Evaporation Skid	1,060	31.9	43.6	42.4	40.0	36.6	30.0	20.7	8.4	-3.3	-17.8
Chiller Package	1,060	25.4	25.6	24.4	22.0	25.6	23.0	19.7	18.4	8.7	-14.8
Auxiliary Cooling Tower	1,060	38.0	47.6	47.4	47.0	43.6	35.0	23.7	15.4	4.7	-7.8
Fuel Gas Compressor Skid	1,060	37.9	51.5	50.0	42.1	40.8	36.4	30.5	26.3	17.8	6.7
Tempering Air Fans	1,060	27.9	44.6	41.4	37.0	31.6	25.0	19.7	5.4	-6.3	-15.8
Distance to acoustic center	**1,060**										
CTG, CTG Auxiliary Skid, SCR, Exhaust Stack	1,060										
Standard Lw			129	124	117	111	103	98	95	97	95
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	5	11	19
Barrier Attenuation			6	7	9	10	12	15	19	21	23
Directivity			0	0	0	0	0	0	0	0	0
CTG, SPL		**38**	**65**	**58**	**49**	**42**	**31**	**22**	**12**	**7**	**-5**
Ammonia Evaporation Skid	1,060										
Standard Lw			108	108	108	106	102	97	91	87	82
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	5	11	19
Barrier Attenuation			6	7	9	10	12	15	19	21	23
Directivity			0	0	0	0	0	0	0	0	0
Ammonia Evaporation Skid, SPL		**32**	**44**	**42**	**40**	**37**	**30**	**21**	**8**	**-3**	**-18**
Chiller Package	1,060										
Standard Lw			90	90	89	95	95	96	100	99	85
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	5	11	19
Barrier Attenuation			6	7	8	10	12	15	18	21	23
Directivity			0	0	0	0	0	0	0	0	0

Chiller Package, SPL		**25**	**26**	**24**	**22**	**26**	**23**	**20**	**18**	**9**	**-15**
Auxiliary Cooling Tower	1,060										
Standard Lw			111	111	112	110	104	96	92	90	89
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	5	11	19
Barrier Attenuation			5	5	6	7	9	11	13	16	20
Directivity			0	0	0	0	0	0	0	0	0
Auxiliary Cooling Tower, SPL		**38**	**48**	**47**	**47**	**44**	**35**	**24**	**15**	**5**	**-8**
Fuel Gas Compressor Skid	1,060										
Standard Lw			116	116	110	110	108	107	109	108	107
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	5	11	19
Barrier Attenuation			6	7	9	10	12	15	19	21	23
Directivity			0	0	0	0	0	0	0	0	0
Fuel Gas Compressor Skid, SPL		**38**	**51**	**50**	**42**	**41**	**36**	**31**	**26**	**18**	**7**
Tempering Air Fans	1,060										
Standard Lw			109	107	105	101	97	96	88	84	84
Distance Correction			58	58	58	58	58	58	58	58	58
Atmospheric Absorption (59 deg F, 70% RH)			0	1	1	1	2	3	5	11	19
Barrier Attenuation			6	7	9	10	12	15	19	21	23
Directivity			0	0	0	0	0	0	0	0	0
Tempering Air Fans, SPL		**28**	**45**	**41**	**37**	**32**	**25**	**20**	**5**	**-6**	**-16**

Barrier Calculations						
	CTG	Amm	Chiller	Cooling	Comp.	Fans
Source height, ft	742	8	14	45	14	9
Barrier height, ft	10	10	10	10	10	10
Receiver height, ft	5	5	5	5	5	5
Source elevation, ft.	0	727	728	728	718	727
Barrier elevation, ft	752	752	752	752	752	752
Receiver elevation, ft.	752	752	752	752	752	752
Distance, source to barrier, ft	970	990	1080	1080	1130	970
Distance, barrier to receiver, ft	100	100	100	100	100	100
Path length difference, ft	0.23	0.27	0.21	0.07	0.27	0.27
Sign	+	+	+	+	+	+

Table Const-1 Analysis of Estimated Overall Construction Noise Level in October

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	0	0.16	85					
Cranes - Mobile 45 ton	1	6	0	0.16	85					
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	15	0.4	88	0	-1	-1	-4	81
Excavator - Trencher (CAT320)	1	6	0	0.4	85					
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	10	0.08	86	0	-1	-3	-11	71
Excavator - Backhoe/loader* Days per unit (	2	6	10	0.4	83	3	-1	-3	-4	78
Excavator - loader	1	6	10	0.4	79	0	-1	-3	-4	71
Portable Compaction Roller	1	6	5	0.4	87	0	-1	-6	-4	76
Truck - Water	1	8	10	0.4	87	0	0	-3	-4	80
Forklift* days per unut or lift-days?	2	6	0	0.4	87					
Dump Truck* days per unit or truckdays	2	1	10	0.4	87	3	-9	-3	-4	74
Service Truck - 1 ton	2	0.5	0	0.4	87					
Truck - Fuel/Lube	1	2	10	0.4	87	0	-6	-3	-4	74
Concrete Pumper Truck	1	2	0	0.4	82					
Tractor Truck 5th Wheel	1	3	5	0.4	87	0	-4	-6	-4	73
Trucks - Pickup 3/4 ton	3	0.5	10	0.4	87	5	-12	-3	-4	73
Trucks - 3 ton	2	0.5	20	0.4	87	3	-12	0	-4	74
Diesel Powered Welder	1	6	0	0.4	87					
Portable Compaction - Vibratory Plate	1	6	0	0.4	76					
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	0	0.4	83					
Air Compressor 185 CFM	1	6	0	1	81					
Concrete Trowel Machine	1	2	0	0.4	76					
Portable Power Generators	3	8	0	1	78					
									Estimated Combined Leq @ 50':	87

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 21).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-2. Analysis of Estimated Overall Construction Noise Level in November

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	0	0.16	85					
Cranes - Mobile 45 ton	1	6	0	0.16	85					
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	15	0.4	88	0	-1	-2	-4	81
Excavator - Trencher (CAT320)	1	6	10	0.4	85	0	-1	-3	-4	76
Excavator - Earth Scraper 623	2	6	15	0.4	89	3	-1	-2	-4	85
Excavator - Motor Grader (CAT140H)	1	6	8	0.08	86	0	-1	-4	-11	69
Excavator - Backhoe/loader* Days per unit (	2	6	22	0.4	83	3	-1	0	-4	81
Excavator - loader	1	6	5	0.4	79	0	-1	-6	-4	67
Portable Compaction Roller	1	6	12	0.4	87	0	-1	-3	-4	79
Truck - Water	1	8	22	0.4	87	0	0	0	-4	83
Forklift* days per unut or lift-days?	2	6	10	0.4	87	3	-1	-3	-4	81
Dump Truck* days per unit or truckdays	2	1	22	0.4	87	3	-9	0	-4	77
Service Truck - 1 ton	2	0.5	22	0.4	87	3	-12	0	-4	74
Truck - Fuel/Lube	1	2	22	0.4	87	0	-6	0	-4	77
Concrete Pumper Truck	1	2	5	0.4	82	0	-6	-6	-4	66
Tractor Truck 5th Wheel	1	3	22	0.4	87	0	-4	0	-4	79
Trucks - Pickup 3/4 ton	3	0.5	22	0.4	87	5	-12	0	-4	76
Trucks - 3 ton	2	0.5	22	0.4	87	3	-12	0	-4	74
Diesel Powered Welder	1	6	0	0.4	87					
Portable Compaction - Vibratory Plate	1	6	10	0.4	76	0	-1	-3	-4	67
Portable Compaction - Vibratory Ram	1	6	10	0.4	76	0	-1	-3	-4	67
Articulating Boom Platform	2	4	0	0.4	83					
Air Compressor 185 CFM	1	6	0	1	81					
Concrete Trowel Machine	1	2	5	0.4	76	0	-6	-6	-4	60
Portable Power Generators	3	8	22	1	78	5	0	0	0	83
									Estimated Combined Leq @ 50':	92

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-3. Analysis of Estimated Overall Construction Noise Level in December

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	15	0.16	85	0	-1	-2	-8	74
Crane - Mobile 65 ton	1	4	0	0.16	85					
Cranes - Mobile 45 ton	1	6	0	0.16	85					
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	10	0.4	85	0	-1	-3	-4	76
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	8	0.08	86	0	-1	-4	-11	69
Excavator - Backhoe/loader* Days per unit c	2	6	15	0.4	83	3	-1	-2	-4	79
Excavator - loader	1	6	10	0.4	79	0	-1	-3	-4	70
Portable Compaction Roller	1	6	5	0.4	87	0	-1	-6	-4	75
Truck - Water	1	8	22	0.4	87	0	0	0	-4	83
Forklift* days per unut or lift-days?	2	6	22	0.4	87	3	-1	0	-4	85
Dump Truck* days per unit or truckdays	2	1	22	0.4	87	3	-9	0	-4	77
Service Truck - 1 ton	2	0.5	22	0.4	87	3	-12	0	-4	74
Truck - Fuel/Lube	1	2	22	0.4	87	0	-6	0	-4	77
Concrete Pumper Truck	1	2	5	0.4	82	0	-6	-6	-4	66
Tractor Truck 5th Wheel	1	3	5	0.4	87	0	-4	-6	-4	72
Trucks - Pickup 3/4 ton	3	0.5	22	0.4	87	5	-12	0	-4	76
Trucks - 3 ton	2	0.5	10	0.4	87	3	-12	-3	-4	71
Diesel Powered Welder	1	6	22	0.4	87	0	-1	0	-4	82
Portable Compaction - Vibratory Plate	1	6	10	0.4	76	0	-1	-3	-4	67
Portable Compaction - Vibratory Ram	1	6	10	0.4	76	0	-1	-3	-4	67
Articulating Boom Platform	2	4	22	0.4	83	3	-3	0	-4	79
Air Compressor 185 CFM	1	6	10	1	81	0	-1	-3	0	76
Concrete Trowel Machine	1	2	5	0.4	76	0	-6	-6	-4	60
Portable Power Generators	3	8	22	1	78	5	0	0	0	83
									Estimated Combined Leq @ 50':	91

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-4. Analysis of Estimated Overall Construction Noise Level in January

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	10	0.16	85	0	-1	-3	-8	72
Crane - Mobile 65 ton	1	4	20	0.16	85	0	-3	0	-8	74
Cranes - Mobile 45 ton	1	6	5	0.16	85	0	-1	-6	-8	69
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	10	0.4	85	0	-1	-3	-4	76
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	0	0.08	86					
Excavator - Backhoe/loader* Days per unit c	2	6	15	0.4	83	3	-1	-2	-4	79
Excavator - loader	1	6	0	0.4	79					
Portable Compaction Roller	1	6	0	0.4	87					
Truck - Water	1	8	22	0.4	87	0	0	0	-4	83
Forklift* days per unut or lift-days?	2	6	22	0.4	87	3	-1	0	-4	85
Dump Truck* days per unit or truckdays	2	1	5	0.4	87	3	-9	-6	-4	71
Service Truck - 1 ton	2	0.5	22	0.4	87	3	-12	0	-4	74
Truck - Fuel/Lube	1	2	22	0.4	87	0	-6	0	-4	77
Concrete Pumper Truck	1	2	3	0.4	82	0	-6	-9	-4	63
Tractor Truck 5th Wheel	1	3	10	0.4	87	0	-4	-3	-4	75
Trucks - Pickup 3/4 ton	3	0.5	22	0.4	87	5	-12	0	-4	76
Trucks - 3 ton	2	0.5	10	0.4	87	3	-12	-3	-4	71
Diesel Powered Welder	1	6	22	0.4	87	0	-1	0	-4	82
Portable Compaction - Vibratory Plate	1	6	0	0.4	76					
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	22	0.4	83	3	-3	0	-4	79
Air Compressor 185 CFM	1	6	22	1	81	0	-1	0	0	80
Concrete Trowel Machine	1	2	3	0.4	76	0	-6	-9	-4	57
Portable Power Generators	3	8	22	1	78	5	0	0	0	83
									Estimated Combined Leq @ 50':	91

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-5. Analysis of Estimated Overall Construction Noise Level in February

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	15	0.16	85	0	-3	-2	-8	72
Cranes - Mobile 45 ton	1	6	5	0.16	85	0	-1	-6	-8	69
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	0	0.4	85					
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	0	0.08	86					
Excavator - Backhoe/loader* Days per unit (	2	6	10	0.4	83	3	-1	-3	-4	77
Excavator - loader	1	6	0	0.4	79					
Portable Compaction Roller	1	6	0	0.4	87					
Truck - Water	1	8	22	0.4	87	0	0	0	-4	83
Forklift* days per unut or lift-days?	2	6	22	0.4	87	3	-1	0	-4	85
Dump Truck* days per unit or truckdays	2	1	5	0.4	87	3	-9	-6	-4	71
Service Truck - 1 ton	2	0.5	10	0.4	87	3	-12	-3	-4	71
Truck - Fuel/Lube	1	2	22	0.4	87	0	-6	0	-4	77
Concrete Pumper Truck	1	2	0	0.4	82					
Tractor Truck 5th Wheel	1	3	10	0.4	87	0	-4	-3	-4	75
Trucks - Pickup 3/4 ton	3	0.5	22	0.4	87	5	-12	0	-4	76
Trucks - 3 ton	2	0.5	10	0.4	87	3	-12	-3	-4	71
Diesel Powered Welder	1	6	22	0.4	87	0	-1	0	-4	82
Portable Compaction - Vibratory Plate	1	6	0	0.4	76					
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	22	0.4	83	3	-3	0	-4	79
Air Compressor 185 CFM	1	6	15	1	81	0	-1	-2	0	78
Concrete Trowel Machine	1	2	0	0.4	76					
Portable Power Generators	3	8	22	1	78	5	0	0	0	83
									Estimated Combined Leq @ 50':	91

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-6. Analysis of Estimated Overall Construction Noise Level in March

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	10	0.16	85	0	-3	-3	-8	71
Cranes - Mobile 45 ton	1	6	5	0.16	85	0	-1	-6	-8	69
Cranes - Mobile 35 ton	1	4	20	0.16	85	0	-3	0	-8	74
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	0	0.4	85					
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	0	0.08	86					
Excavator - Backhoe/loader* Days per unit c	2	6	10	0.4	83	3	-1	-3	-4	77
Excavator - loader	1	6	0	0.4	79					
Portable Compaction Roller	1	6	0	0.4	87					
Truck - Water	1	8	22	0.4	87	0	0	0	-4	83
Forklift* days per unut or lift-days?	2	6	22	0.4	87	3	-1	0	-4	85
Dump Truck* days per unit or truckdays	2	1	0	0.4	87					
Service Truck - 1 ton	2	0.5	10	0.4	87	3	-12	-3	-4	71
Truck - Fuel/Lube	1	2	22	0.4	87	0	-6	0	-4	77
Concrete Pumper Truck	1	2	0	0.4	82					
Tractor Truck 5th Wheel	1	3	10	0.4	87	0	-4	-3	-4	75
Trucks - Pickup 3/4 ton	3	0.5	22	0.4	87	5	-12	0	-4	76
Trucks - 3 ton	2	0.5	0	0.4	87					
Diesel Powered Welder	1	6	22	0.4	87	0	-1	0	-4	82
Portable Compaction - Vibratory Plate	1	6	0	0.4	76					
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	0	0.4	83					
Air Compressor 185 CFM	1	6	15	1	81	0	-1	-2	0	78
Concrete Trowel Machine	1	2	0	0.4	76					
Portable Power Generators	3	8	22	1	78	5	0	0	0	83
									Estimated Combined Leq @ 50':	91

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-7. Analysis of Estimated Overall Construction Noise Level in April

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	0	0.16	85					
Cranes - Mobile 45 ton	1	6	0	0.16	85					
Cranes - Mobile 35 ton	1	4	10	0.16	85	0	-3	-3	-8	71
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	0	0.4	85					
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	10	0.08	86	0	-1	-3	-11	70
Excavator - Backhoe/loader* Days per unit (	2	6	0	0.4	83					
Excavator - loader	1	6	0	0.4	79					
Portable Compaction Roller	1	6	10	0.4	87	0	-1	-3	-4	78
Truck - Water	1	8	22	0.4	87	0	0	0	-4	83
Forklift* days per unut or lift-days?	2	6	22	0.4	87	3	-1	0	-4	85
Dump Truck* days per unit or truckdays	2	1	0	0.4	87					
Service Truck - 1 ton	2	0.5	0	0.4	87					
Truck - Fuel/Lube	1	2	22	0.4	87	0	-6	0	-4	77
Concrete Pumper Truck	1	2	0	0.4	82					
Tractor Truck 5th Wheel	1	3	0	0.4	87					
Trucks - Pickup 3/4 ton	3	0.5	22	0.4	87	5	-12	0	-4	76
Trucks - 3 ton	2	0.5	0	0.4	87					
Diesel Powered Welder	1	6	0	0.4	87					
Portable Compaction - Vibratory Plate	1	6	10	0.4	76	0	-1	-3	-4	67
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	0	0.4	83					
Air Compressor 185 CFM	1	6	15	1	81	0	-1	-2	0	78
Concrete Trowel Machine	1	2	0	0.4	76					
Portable Power Generators	3	8	22	1	78	5	0	0	0	83
									Estimated Combined Leq @ 50':	90

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-8. Analysis of Estimated Overall Construction Noise Level in May

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	0	0.16	85					
Cranes - Mobile 45 ton	1	6	0	0.16	85					
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	0	0.4	85					
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	0	0.08	86					
Excavator - Backhoe/loader* Days per unit (	2	6	0	0.4	83					
Excavator - loader	1	6	0	0.4	79					
Portable Compaction Roller	1	6	10	0.4	87	0	-1	-3	-4	78
Truck - Water	1	8	0	0.4	87					
Forklift* days per unut or lift-days?	2	6	10	0.4	87	3	-1	-3	-4	81
Dump Truck* days per unit or truckdays	2	1	0	0.4	87					
Service Truck - 1 ton	2	0.5	0	0.4	87					
Truck - Fuel/Lube	1	2	0	0.4	87					
Concrete Pumper Truck	1	2	0	0.4	82					
Tractor Truck 5th Wheel	1	3	0	0.4	87					
Trucks - Pickup 3/4 ton	3	0.5	10	0.4	87	5	-12	-3	-4	72
Trucks - 3 ton	2	0.5	0	0.4	87					
Diesel Powered Welder	1	6	0	0.4	87					
Portable Compaction - Vibratory Plate	1	6	10	0.4	76	0	-1	-3	-4	67
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	0	0.4	83					
Air Compressor 185 CFM	1	6	0	1	81					
Concrete Trowel Machine	1	2	0	0.4	76					
Portable Power Generators	3	8	10	1	78	5	0	-3	0	79
									Estimated Combined Leq @ 50':	85

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-9. Analysis of Estimated Overall Construction Noise Level in June

Equipment	Number of Units[1]	Hrs/Day Per Unit[1]	Number of Days of Use/ Month[1]	Usage Factor[2]	Typical Level @ 50', dBA[3]	Correction for Number of Units[4]	Correction for Hrs/Day[5]	Correction for No. of Days of Use in Month[6]	Correction for Usage Factor[7]	Estimated Leq @ 50', dBA[8]
Truck Crane - Greater than 300 ton	1	6	0	0.16	85					
Crane - Mobile 65 ton	1	4	0	0.16	85					
Cranes - Mobile 45 ton	1	6	0	0.16	85					
Cranes - Mobile 35 ton	1	4	0	0.16	85					
Bulldozer D10R	1	6	0	0.4	88					
Excavator - Trencher (CAT320)	1	6	0	0.4	85					
Excavator - Earth Scraper 623	2	6	0	0.4	89					
Excavator - Motor Grader (CAT140H)	1	6	0	0.08	86					
Excavator - Backhoe/loader* Days per unit c	2	6	0	0.4	83					
Excavator - loader	1	6	0	0.4	79					
Portable Compaction Roller	1	6	0	0.4	87					
Truck - Water	1	8	0	0.4	87					
Forklift* days per unut or lift-days?	2	6	0	0.4	87					
Dump Truck* days per unit or truckdays	2	1	5	0.4	87	3	-9	-6	-4	71
Service Truck - 1 ton	2	0.5	0	0.4	87					
Truck - Fuel/Lube	1	2	0	0.4	87					
Concrete Pumper Truck	1	2	0	0.4	82					
Tractor Truck 5th Wheel	1	3	0	0.4	87					
Trucks - Pickup 3/4 ton	3	0.5	10	0.4	87	5	-12	-3	-4	72
Trucks - 3 ton	2	0.5	0	0.4	87					
Diesel Powered Welder	1	6	0	0.4	87					
Portable Compaction - Vibratory Plate	1	6	0	0.4	76					
Portable Compaction - Vibratory Ram	1	6	0	0.4	76					
Articulating Boom Platform	2	4	0	0.4	83					
Air Compressor 185 CFM	1	6	0	1	81					
Concrete Trowel Machine	1	2	0	0.4	76					
Portable Power Generators	3	8	10	1	78	5	0	-3	0	79
									Estimated Combined Leq @ 50':	81

Notes:

1. Obtained from TIC.
2. Percentage of time equipment is operating at noisiest mode in most used phase on site. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
3. Obtained or estimated from "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances;" BBN; December 31, 1971.
4. Calculated as 10*Log(Column B).
5. Calculated as 10*Log(Column C / 8).
6. Calculated as 10*Log(Column D / 22).
7. Calculated as 10*Log(Column E).
8. Calculated as arithmetic sum of Columns F through J.

Table Const-10. Summary of Estimated Construction Noise Levels

	Nearest Residence to North	Nearest Residence to Southwest	Nearest Residence to Southeast	Nearest Residence to the South	Nearest Residence to Southeast	Nearest Park	Nearest School	Nearest Church	Trail	Nearest Industry to South	Nearest Industry to East	Nearest Offices to West	Nearest Industry to North	Kennel Residence
Estimated Leq @ 50'	92	92	92	92	92	92	92	92	92	92	92	92	92	92
Distance from center of project site	2,900	4,070	4,200	3,950	5,600	3,300	3,610	1,250	830	610	770	720	2,320	1,160
Attenuation due to distance	-35	-38	-38	-38	-41	-36	-37	-28	-24	-22	-24	-23	-33	-27
Attenuation due to air absorption[1]	-5	-7	-8	-7	-10	-6	-6	-2	-1	-1	-1	-1	-4	-2
Attenuation due to barrier effects	0	0	0	0	0	-8	-8	-13	-18	-19	-12	-7	0	-13
Estimated construction noise level	51	46	46	47	41	41	40	49	48	50	55	60	54	49
Ambient	57	50	70	59	48	56	48	59	46	61	58	55	60	63
Ambient + construction noise	58	52	70	59	49	56	49	59	50	61	60	61	61	63
Increase due to construction noise	1	2	0	0	1	0	1	0	4	0	2	6	1	0

Notes:

1. Attenuation at 500 Hz for atmosphere at 59 deg F, 70% RH. Attenuation at 500 Hz assumed to be representative of overall attenuation since most construction noise is associated with diesel engines and exhaust.

Barrier Calculations

Source height, ft						8	8	8	8	8	8	8		8
Barrier height, ft						20	20	10	0	10	0	10		10
Receiver height, ft						5	5	5	5	5	5	5		5
Source elevation, ft.						728	728	728	728	728	728	728		728
Barrier elevation, ft						765	765	760	755	750	755	728		750
Receiver elevation, ft.						780	780	760	730	750	760	728		752
Distance, source to barrier, ft						2930	3030	950	560	600	290	280		630
Distance, barrier to receiver, ft						370	580	300	270	10	480	440		530
Path length difference, ft						0.05	0.06	0.31	1.06	1.36	0.18	0.03		0.28
Barrier attenuation @ 500 Hz						-8	-8	-13	-18	-19	-12	-7		-13

Prepared Direct Testimony
Of
Karl Lany

1. Q. Please state your name and employer.
   A. My name is Karl Lany and I am Vice President and Manager of Regulatory Services for SCEC.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center?
   A. SCEC has been retained by the project to evaluate air quality impacts that could result from project construction and operation.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

Exh. 1	Section 2.5.2	Emission Equipment	
	Section 6.1	Air Quality	
		Appendix B	Generating Station Criteria Pollution Emissions
		Appendix C	Generating Station Operating Toxic Pollutant Emissions
		Appendix D	Generating Station Construction Emissions
		Appendix E	Transmission Line Construction Emissions
		Appendix F	Generating Station Stationary Source Air Dispersion Modeling Information
		Appendix G	Generating Station Stationary Source Ambient Air Quality Impact Analysis
		Appendix H	Generating Station Construction Activity Air Dispersion Modeling Information
		Appendix I	Generating Station Construction Activity Ambient Air Quality Impact Analysis
		Appendix J	Generating Station Construction and Stationary Source Health Risk Assessment
	Section 6.8	Public Health and Safety	
	Section 6.8	Appendix	Aqueous Ammonia Hazard Assessment Attachment
Exh 2	Responses 2 – 15, 17-19		

Exh 3	Response 17 and response regarding Will Walters CD
Exh 5	6 mile sensitive receptors
Exh 6	2.a.iii and 2.a.iv, 6.a-6.c.ii, 7.a-7.c, 9.a-9.c, 11.a-11.c Additional responses on Legionella, NOx BACT and Incomplete Combustion
Exh 8	Response 13.a13.c, 14.a-14.e and 15.a
Exh 9	Responses 16-20

I am also submitting the following attachments to my testimony:

Attachment 1	Revised Construction Emissions Inventory, Air Quality Impact Analysis and Health Risk Assessment
Attachment 2	Supplemental Soil Analysis Results
Attachment 3	Revised Operating Emissions Dispersion Analysis and Air Quality Impact Assessment, and Health Risk Assessment
Attachment 4	Revised Cooling Tower Emissions Inventory
Attachment 5	Revised ZLD Discharge Emissions Inventory

4. Q. With regard to construction emission assumptions, do you have any changes to your testimony:

A. We have continued to refine the construction emissions analysis beyond our submittal of August 2, 2004. Reasons for continuing to refine our analysis are:

1. Address any impacts of the revised General Arrangement.

   The major impacts of the General Arrangement change were to relocate the gas compressors and tanks to the west side of the project site.

2. The Industrial Company (TIC) has been retained by the City of Riverside as its EPC Contractor.

With the involvement of TIC, the firm that will both perform the detailed design and construction, we have utilized their expertise in better modeling their plan of construction. Such refinements have included:

- Refined equipment schedule (number, type of equipment, operating hours, fuel consumption, etc.)
- Refined construction schedule
- Utilizing a more detailed grading plan to minimize the cut and fill activities and limit off-site haulage.
- Finalizing land use within the project site including laydown space and moving construction parking to the southeast corner of the project site.
- Refining the construction head count and factoring that into off-site travel

3. We have obtained supplemental geotechnical information on the project site.

   - We have conducted four additional borings at the site for the purposes of gathering silt content at the surface and below the surface. We conducted one boring within the footprints for the two combustion turbines and SCRs at a previously undisturbed location. We gathered silt data at the surface and at approximately six (6) feet below the surface. The resulting values, when combined with previously submitted results show surface level silt content to be an average of 13.2% from surface level to three-feet in depth, and 7.2% from surface level to six-feet in depth. The silt analysis reflects tests using a #200 sieve. The new silt value of 13.2% was used in our refined construction emissions analysis for surface operations. The average value of 7.2% was used in our analysis for subsurface operations.

   - In conjunction with gathering additional silt content data, we also performed testing to determine the optimum moisture content for compacting operations. That value is 8.33%, $\pm$2%. Based upon input from the geotechnical consultant and requirements to apply water during earthmoving operations, we believe that soil will be sufficiently moist to ensure the level of emission control reflected in our emission calculations.

We incorporated the revised emissions inventory and source location data into a revised dispersion model and air quality impact analysis. The results confirm that the construction project is not likely to cause or significantly add to a violation of an ambient air quality standard. The revised results also confirm that the construction project will not result in

individual cancer risk or acute health risk in excess of a threshold of significance.

5. Q. With regard to operation emission assumptions, would you comment on the CEC Staff discussion of the following?
   (a) Cooling tower emissions (Final Initial Study, page 4-28)
   (b) ZLD emissions (Final Initial Study, page 4-28

A. We have continued to refine the project design for a Zero Liquid Discharge system. We are planning on using an integrated demin/ZLD system that takes wastewater and produces demineralized water for plant use and a filter cake or slurry for disposal. Our current design is to use the 1st stage effluent from the demin system for make-up to the cooling tower. This will result in lower TDS water being supplied to the cooling tower, and as a result, less PM10 emissions from the tower. With this approach PM10 emissions have been reduced.

On August 2, we submitted cooling tower emissions calculations based upon pre-treated intake water with a TDS content of 10.2 ppm. We have since learned that while the lower intake concentration can be achieved, it may also have a negative impact on cooling tower durability. We have since recalculated cooling tower emissions assuming an inlet concentration of 50 ppm and 25 concentration cycles, or a maximum TDS concentration of 1,250 ppm. The optimal cooling tower management strategy is to allow only 15 concentration cycles, which will produce lower PM10 emissions than we have calculated.

These changes result in a slight increase in PM10 emissions over the data presented to CEC on August 2, 2004 and the data presented in table 23 of the FIS. The August 2, 2004 submittal reflected emissions that would occur if the maximum TDS concentration in the cooling tower water was 153 ppmv, versus the 1,250 ppm that is currently assumed. On June 14, 2004, however, we submitted an emissions inventory and air quality impact analysis that reflected an assumed TDS concentration of approximately 2,644 ppm in the cooling tower water.

On August 2, 2004, we provided PM10 calculations for a ZLD filter cake discharge. Expected emissions from the filter cake are not expected to change from the August 2, 2004 transmittal. If a filter cake press is not used, there will be a low flow slurry discharge. PM10 emissions from this option would be bounded by the filter press option.

CEC has suggested that, due to the relocation of the ZLD equipment, we should incorporate ZLD emissions into our air quality impact analysis. We have complied with CEC's request and incorporated ZLD filter press emissions into the air dispersion model and ambient air quality assessment. The revised assessment also includes changes made to the

cooling tower emissions inventory and the reconfiguration of the facility general arrangement. The results are similar to the results submitted to CEC onJune 14, 2004, with the exception of annual ambient PM10 concentrations. The revised ambient PM impacts are lower than the impacts submitted to CEC on June 14, 2004, due to the reduction in cooling tower emissions.

6. Q. Would you comment on the project's black-start capability?

A. The project has provisions for black start, meaning the ability to start one of the Units when the offsite electric power grid is deenergized or "black." This is a very infrequent occurrence. Several years can pass between turbine black-start events.

The electricity to start a Unit is provided via a 4160 V and 480 V crosstie from the Water Quality Control Plant (WQCP) cogen plant. The cogeneration engines at the WQCP currently operate to meet a portion of the WQCP's electrical needs. In the event of a grid emergency where it would be necessary to black start the RERC, power from the cogen plant would be available for the approximate half-hour it would be needed. Once the first Unit at RERC is running, then the power from that Unit could be used to start the second Unit and begin power restoration within the RPU electric system.

As the cogen units are running essentially continuously to convert waste landfill/digester gas to electricity to mitigate methane gas releases, they represent the most environmentally benign manner of providing black start capability and they allow critical operating flexibility that could otherwise be achieved only through the use of diesel engines. Diversion of power from the engines to provide limited black-start will not result in operations in excess of SCAQMD permitted fuel throughput, operating hours or emission rates for the WQCP cogeneration engines.

7. Q. The Staff Final Initial Study discusses offsets for project operations (Final Initial Study, page 4-50). Would you comment on project offsets?

A. The project is committed to offsetting operating emissions through the purchase or the creation of offsets. The Applicant has already purchased the necessary NO_x offsets and is exploring a number of alternative ways of obtaining offsets for PM10, VOC and SO_2, including offset credit purchases and generating reductions through diesel engine retrofit projects. The Applicant has reviewed CEC staff proposed condition AQ-1 and believes that the proposed compliance schedule is appropriate.

8. Q. Would you comment on project construction and operation emissions at the Hidden Valley Dog Kennel and impacts within a 6-mile radius of the project?

A. We conducted an air dispersion model of construction emissions to determine the ambient air quality impacts upon the nearest four residential receptors. Of the four, the Hidden Valley Dog Kennel is the closest to the project and also experiences the highest impacts from the construction project. Our analysis shows that concentrations of NO_2, CO, SO_2 , and annual average concentrations of PM10 at the Hidden Valley Dog Kennel are below the most stringent state and federal standards, which serve as thresholds of significance.

Recently, the South Coast Air Quality Management District adopted voluntary short-term reference limit of 10.4 $\mu g/m^3$ for average 24-hour exposure to PM10 from construction operations through the District's Environmental Justice Initiative. The 24-hr average PM10 concentration resulting from construction operations at the kennel is 10.23 $\mu g/m^3$, based upon a 12-hour work-day during peak earthmoving operations. The ambient 24-hour concentration would be significantly lower during a more typical 8-hour workday and after the project transitions from earthmoving to non-earthmoving construction operations.

We also conducted a health risk assessment to determine the maximum individual cancer risk resulting from the combustion of diesel fuel during construction operations. The analysis indicates that the individual cancer risk to receptors along the southern boundary of the plant resulting from construction operations is 4.97×10^{-7}. The resulting cancer risk value is less than half of the threshold of significance of 1×10^{-6}. The cancer risk at the kennel is significantly lower than at the project fence line because average concentrations of construction-related emissions from the project are approximately 90% lower at the kennel than at the fence line.

We also conducted a non-cancer acute health risk assessment. At the point of maximum exposure, the acute risk index is 0.0163, relative to a reference significance threshold of 1.0. As with cancer risk, lower emission concentrations at the kennel will result in acute health risks that are lower than those that would exist at the project fence line.

CEC staff initiated a search of SCAQMD permitting records to determine if any projects within a six-mile radius of the project have been permitted, but not constructed; or that may have been constructed but not likely to have been operated during the past year. Such projects represent a potential air quality impact that would not have been reflected in recent ambient air quality monitoring data and would conceivably have to be considered in a cumulative air quality impact analysis for our project. Based upon the results of the investigation, CEC staff determined that no

outstanding projects can be identified that would constitute an increase in emissions of air pollutants.

6. Q. Does that complete your direct testimony?
A. Yes, it does.

SCEC

RIVERSIDE ENERGY RESOURCE CENTER

REVISED CONSTRUCTION EMISSIONS, AIR QUALITY IMPACT ANALYSIS AND HEALTH RISK ASSESSMENT

PREPARED FOR:

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FOR SUBMITTAL TO:

California Energy Commission

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August 12, 2004

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1.0 Introduction

Recent improved data regarding the construction and equipment schedules for the Riverside Energy Resource Center (RERC) became available after August 2, 2004. Additional soil analysis results also became available. The new information warrants changes to the construction emissions inventory, the construction air quality impact analysis and the construction emissions health risk assessment.

2.0 Construction Emissions Inventory

The construction inventory that was submitted to CEC on August 2, 2004 has since been revised to reflect newer and more accurate information. The following sections of this report briefly describe changes to inventory input and provide a summary of the revised inventory.

2.1 Changes in Construction Emissions Inventory Input

The City of Riverside recently contracted with The Industrial Company (TIC) to oversee construction of the Riverside Energy Resource Center. TIC has since initiated construction planning and has provided additional guidance regarding the type of equipment to be used and the schedule for the construction project. TIC's review resulted in changes to the construction inventory that was submitted to CEC on August 2, 2004. The inventory summarized in Appendix A reflects the following changes:

- Peak daily and project equipment operating hours have been revised. The revisions altered estimated peak daily and project fuel consumption rates.
- The locations of construction emission sources were generally shifted in a southward direction, reflecting the revised general arrangement and work activities. Most emissions are now assumed to be released in the southern half of the project during earthmoving operations, followed by a shift toward the center of the project during construction operations.
- Additional silt analyses were conducted and incorporated into the emissions calculations.
- Two earth scrapers were added to the equipment list.
- High-traffic areas and the lay-down areas are expected be covered with crushed rock after grading is complete.

2.2 Revised Construction Emission Inventory

Revised construction emissions are summarized in Tables 2-1 and 2-2. Emissions include both on-site and off-site emissions attributed to construction of the facility, but exclude emissions attributed to construction of the transmission line. Daily emissions attributed to transmission line construction activity are included in Table 2-3. Detailed emission inventory data are included in Appendix A.

Table 2-1
Maximum Daily Emissions During On-site Construction
November, 2004 lbs/day

	NOx	CO	VOC	SOx	PM10
On-site					
Construction Equipment Combustion Emissions	116.36	96.39	6.96	0.11	4.66
Unpaved Road Travel Fugitive PM Emissions					15.88
Grading / Bulldozing Fugitive PM Emissions					7.30
Earth Loading Fugitive PM Emissions					13.78
Disturbed Soil Wind Erosion PM Emissions					0.05
Granite Blasting					0.00
Off-site					
Passenger Vehicle - Combustion Emissions*	4.32	39.26	4.13	0.02	0.18
Delivery Truck Combustion Emissions*	14.22	2.10	0.44	0.14	0.28
Passenger Vehicle - Paved Road Dust					5.12
Delivery Truck - Paved Road Dust					38.85
Total Emissions	134.9	137.75	11.53	0.27	86.10

Table 2-2
Annual Air Emissions During On-site Construction, lbs/project

	NOx	CO	VOC	SOx	PM10
On-site					
Construction Equipment Combustion Emissions	6,321	12,626	681	6	387
Unpaved Road Travel Fugitive PM Emissions					2,141
Grading / Bulldozing Fugitive PM Emissions					174
Earth Loading Fugitive PM Emissions					268
Disturbed Soil Wind Erosion PM Emissions					7
Granite Blasting					0.24
Off-site					
Passenger Vehicle - Combustion Emissions*	665	6,047	636	22	43
Delivery Truck Combustion Emissions*	2,190	323	67	4	28
Passenger Vehicle - Paved Road Dust					789
Delivery Truck - Paved Road Dust					5,983
Total Emissions (pounds)	9,176	18,996	1,384	32	9,820
Total Emissions (tons)	4.6	9.5	0.7	0.0	4.9

Table 2-3
Maximum Daily Emissions During Transmission Line Construction
February, 2005 lbs/day

	NOx	CO	VOC	SOx	PM10
On-site					
Construction Equipment Combustion Emissions	18.09	13.95	2.53	0.02	1.154
Unpaved Road Travel Fugitive PM Emissions					0.001
Grading / Bulldozing Fugitive PM Emissions					0.215
Earth Loading Fugitive PM Emissions					0.050
Disturbed Soil Wind Erosion PM Emissions					0.017
Off-site					
Delivery Truck - Paved Road Dust					0.661
Total Emissions	18.09	13.95	2.53	0.02	2.098

3.0 Air Quality Impact Analysis and Health Risk Assessment

The change in the emissions inventory, combined with the redistribution of emissions to the southern region of the construction project warranted a revised air quality impact analysis. The following sections of this report provide a summary of analysis methodology and results.

3.1 Methodology

A revised air dispersion modeling was conducted to provide down-wind emission concentration estimates from the construction project. Modeling methodology was retained from prior analyses, with the following exceptions.

- Short-term air quality impacts were estimated for a 12-hour operating day and modeled for 365 days per year to determine if a delay in construction would affect short-term impacts. Short-term impacts reflect maximum hourly emission rates during the earthmoving phase of the project.

- Long-term air quality impacts were assessed based upon project average hourly emissions and a construction schedule of 1408 hours that could occur over any combination of 12-hour days throughout the year. The previous analysis reflected a construction schedule that excluded summer activities.

- The prior health risk assessment methodology was retained, but now reflects revised emission rates.

3.2 Air Quality Impact Analysis

Table 3-1 provides a summary of the air quality impacts that can be attributed to construction activities. Resulting ambient concentrations of NO_2, CO SO_2 and Sulfates at the nearest residential receptor are below the most stringent ambient air quality standard thresholds. Because existing 24 hour and annual ambient PM10 concentrations exceed the most stringent standard, one must determine if the increase in ambient PM10 emissions resulting from the project exceed a threshold of significance. The SCAQMD has defined an increase of ambient PM10 concentrations of 1.0 $\mu g/m^3$ on an annual basis to be significant. The increase from the project, when measured at the nearest residential receptor is 0.13 $\mu g/m^3$. SCAQMD has also defined an increase of ambient PM10 concentrations of 10.4 $\mu g/m^3$ on a 24-hour basis as a voluntary significance threshold for construction projects. The increase in ambient PM10 concentrations attributable to the project is 10.23 $\mu g/m^3$ when measured at the nearest residential receptor location and is below SCAQMD's defined significance threshold. The 24-hour impacts listed in Table 3-1 reflect a 12-hour daily work schedule. 24-hour impacts would be approximately 67% of those listed in table 3-1 during an 8-hour workday. Detailed air quality impact analysis results are included in Appendix B.

Table 3-1
Summary of Air Quality Impact Analysis
Construction Operations

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Most Stringent Standard
NO_2	1 - Hour (ppm)	0.043	0.15	2001, Rubidoux	0.193	0.25
NO_2	Annual (ppm)	0.00009	0.0262	1999, Rubidoux	0.026	0.0534
CO	1 - Hour (ppm)	0.313	11	1997, Riverside	11.3	20
CO	8 - Hour (ppm)	0.068	5.8	1997, Rubidoux	5.9	9
PM	24 - Hour ($\mu g/m^3$)	10.23*	164	2003, Rubidoux	174.2	50*
PM_{10}	Annual ($\mu g/m^3$)	0.13*	72.3	1999, Rubidoux	72.43	20*
Sulfate	24 - Hour ($\mu g/m^3$)	0.39	11.7	2000, Rubidoux	12.09	25
SO_2	1-hour (ppm)	0.00005	0.11	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.00001	0.041	2000, Rubidoux	0.040	0.040

* Because ambient PM concentrations exceed the most stringent air quality standard, an alternative significance threshold has been defined by SCAQMD to be an increase of 1.0 $\mu g/m^3$ on an annual basis and an increase of 10.4 $\mu g/m^3$ on a 24-hour basis at the nearest residential receptor location.

3.3 Health Screening Risk Assessment

Changes in fuel consumption rates and the revised allocation of emission sources within the various regions of the construction site dictated a revision to the screening health risk assessment. A revised assessment was completed for the project utilizing the same methodology that was utilized for the previous assessment. Emission rates from the revised inventory were incorporated in the assessment to determine maximum individual cancer risk (MICR) and acute health risk for the nearest existing offsite receptor. This receptor is located along the south fence line of the facility on commercial / industrial property. The MICR at this location is 4.97×10^{-7}, relative to a 1×10^{-6} threshold of significance. The acute risk index at the receptor location is 0.016, relative to significance threshold of 1.0. Additional screening risk assessment data are included in Appendix C.

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APPENDIX A

CONSTRUCTION EMISSIONS INVENTORY

City of Riverside ERC
Daily Maximum Onsite Construction-Related Emissions (lb/day)
November

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	116.36	96.39	6.96	0.11	4.66
Unpaved Road Travel Fugitive PM Emissions					15.88
Grading / Bulldozing Fugitive PM Emissions					7.30
Earth Loading Fugitive PM Emissions					13.78
Disturbed Soil Wind Erosion PM Emissions					0.05
Granite Blasting					0.00
Total Max. Pounds per Day	**116.4**	**96.4**	**7.0**	**0.1**	**41.7**

City of Riverside ERC
Project On-site Construction Emissions
(lbs/project)

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	6321	12626	681	6	387
Unpaved Road Travel Fugitive PM Emissions					2141
Grading / Bulldozing Fugitive PM Emissions					174
Earth Loading Fugitive PM Emissions					268
Disturbed Soil Wind Erosion PM Emissions					7
Granite Blasting					0.24
Total Pounds per Project	**6321**	**12626**	**681**	**6**	**2977**
Total Tons per Project	**3.2**	**6.3**	**0.3**	**0.0**	**1.5**

City of Riverside ERC
Project Off-site (Regional) Construction Emissions

(lbs / Day)

	NOx	CO	VOC	SOx	PM10
Passenger Vehicle - Combustion Emissions*	4.32	39.26	4.13	0.02	0.18
Delivery Truck Combustion Emissions*	14.22	2.10	0.44	0.14	0.28
Passenger Vehicle - Paved Road Dust					5.12
Delivery Truck - Paved Road Dust					38.85
Total Max. Pounds per Day	18.5	41.4	4.6	0.2	44.4

*PM10 emissions include tire and brake wear.

City of Riverside ERC
Project Off-site (Regional) Construction Emissions
(lbs / project and tons/project)

	NOx	CO	VOC	SOx	PM10
Passenger Vehicle - Combustion Emissions	665	6047	636	22	43
Delivery Truck Combustion Emissions	2190	323	67	4	28
Passenger Vehicle - Paved Road Dust					789
Delivery Truck - Paved Road Dust					5983
Transmission Line Construction	784	549	87	1	59
Total Pounds per Project	3639	6919	790	26	6902
Total Tons per Project	1.8	3.5	0.4	0.0	3.5

*PM10 emissions include tire and brake wear.

City of Riverside ERC
Daily Maximum Construction-Related Emissions (lb/day)
November

	NOx	CO	VOC	SOx	PM10
Onsite Emissions	116.36	96.39	6.96	0.11	41.67
Onroad Emissions	18.54	41.36	4.56	0.16	44.43
Total Max. Pounds per Day	**134.90**	**137.75**	**11.52**	**0.27**	**86.11**

*Onroad PM10 emissions include tire and brake wear.

City of Riverside ERC
Total Construction-Related Emissions (lb/project)

	NOx	CO	VOC	SOx	PM10
Onsite Emissions	6321	12626	681	6	2977
Onroad Emissions	2855	6369	703	25	6843
Transmission Line	784	549	87	1	59
Total Pounds per Project	**9960**	**19545**	**1471**	**33**	**9879**
Total Tons per Project	**5.0**	**9.8**	**0.7**	**0.02**	**4.9**

*Onroad PM10 emissions include tire and brake wear.

Emission Allocation Percentage (November Peak)

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8	Total
	10%	30%	50%	10%					100%
					10%	15%	65%	10%	100%
					7%	32%	55%	6%	100%
					40%	20%	20%	20%	100%
100%									100%
					100%				

Combustion Emissions lb/hr (8-hr day)

	Volume 1	Volume 2	Volume 3	Volume 4	Total lb/hr	Total lb/day
NOx	1.455	4.364	7.273	1.455	14.545	116.36
CO	1.205	3.615	6.024	1.205	12.049	96.39
SOx	0.001	0.004	0.007	0.001	0.014	0.11

Combustion Emissions g/sec

	Volume 1	Volume 2	Volume 3	Volume 4	Total g/sec	Total Lb/hr
NOx	0.18327	0.54981	0.91635	0.18327	1.8327	14.545
CO	0.15181	0.45544	0.75907	0.15181	1.5181	12.049
SOx	0.00017	0.00052	0.00087	0.00017	0.0017	0.014

Emission Allocation Percentage (Project Average)

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8	Total
	70%	12%	10%	8%					100%
					10%	15%	65%	10%	100%
					7%	32%	55%	6%	100%
					40%	20%	20%	20%	100%
100%									100%
					100%				

PM10 Lb/hr - Daily High

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8	Total
	0.0582	0.1747	0.2911	0.0582	0.0000	0.0000	0.0000	0.0000	0.5823
					0.1985	0.2978	1.2906	0.1985	1.9855
					0.0639	0.2920	0.5018	0.0547	0.9124
					0.6890	0.3445	0.3445	0.3445	1.7224
0.0022									0.0022
					0.0000				
0.0022	0.0582	0.1747	0.2911	0.0582	0.9514	0.9343	2.1368	0.5978	5.2048

PM10 Lb/hr - Annual Average (hourly average over 1408 hours reflecting 8 month period, and 8 hours per day)

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8	Total
	0.1924	0.0330	0.0275	0.0220					0.2749
					0.1521	0.2281	0.9886	0.1521	1.5209
					0.0086	0.0395	0.0679	0.0074	0.1235
					0.0761	0.0380	0.0380	0.0380	0.1902
0.0013									0.0013
					0.00017				
0.0013	0.1924	0.0330	0.0275	0.0220	0.2370	0.3057	1.0946	0.1975	2.1109
0.00054	0.08370	0.01435	0.01196	0.00957					

Combustion Emissions lb/hr (Project Average)

	Volume 1	Volume 2	Volume 3	Volume 4	Total lb/hr	Total lb/day	Total Project
NOx	3.143	0.539	0.449	0.359	4.489	35.92	6321
CO	6.277	1.076	0.897	0.717	8.968	71.74	12626
SOx	0.003	0.001	0.000	0.000	0.005	0.04	6

Combustion Emissions g/sec

	Volume 1	Volume 2	Volume 3	Volume 4	Total g/sec	Total Lb/hr
NOx	0.39596	0.06788	0.05657	0.04525	0.5657	4.489
CO	0.79094	0.13559	0.11299	0.09039	1.1299	8.968
SOx	0.00040	0.00007	0.00006	0.00005	0.0006	0.005

Monthly Site Construction Equipment Use
Riverside Energy Resource Center Project

Equipment	Gasoline/ Diesel	Number of Units	Operating Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)	October			November			December		
						Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day
Truck Crane - Greater than 300 ton	D	1	6	7.50	45.00		0		0	0		15	675	45
Truck Crane - Greater than 200 ton	D	0	0	5.00	0.00		0			0			0	
Crane - Mobile 65 ton	D	1	4	4.00	16.00		0			0			0	
Cranes - Mobile 45 ton	D	1	6	4.00	24.00		0			0			0	
Cranes - Mobile 35 ton	D	1	4	4.00	16.00		0			0			0	
Bulldozer D10R	D	1	6	22.25	133.50	15	2002.5	133.5	15	2002.5	133.5		0	
Bulldozer D4C	D	0	0	3.00	0.00		0			0			0	
Excavator - Trencher (CAT320)	D	1	6	6.60	39.60		0		10	396	39.6	10	396	39.6
Excavator - Earth Scraper CAT 623	D	2	6	11.25	135.00	0	0		15	2025	135		0	
Excavator - Motor Grader (CAT140H)	D	1	6	6.00	36.00	10	360	36	8	288	36	8	288	36
Excavator - Backhoe/loader* Days per unit o	D	2	6	2.50	30.00	10	300	30	22	660	30	15	450	30
Excavator - loader	D	1	6	5.00	30.00	10	300	30	5	150	30	10	300	30
Vibratory Roller	D	1	6	10.00	60.00		0			0			0	
Portable Compaction Roller	D	1	6	10.00	60.00	5	300	60	12	720	60	5	300	60
Truck - Water	D	1	8	3.13	25.04	10	250.4	25.04	22	851.36	50.08	22	550.88	25.04
Forklift	D	2	6	2.50	30.00		0		10	300	30	22	660	30
Dump Truck	D	2	1	3.13	6.26	10	62.6	6.26	22	137.72	6.26	22	137.72	6.26
Service Truck - 1 ton	D	2	0.5	1.56	1.56		0		22	34.32	1.56	22	34.32	1.56
Truck - Fuel/Lube	D	1	2	3.13	6.26	10	62.6	6.26	22	137.72	6.26	22	137.72	6.26
Concrete Pumper Truck	D	1	2	3.13	6.26		0		5	31.3	6.26	5	31.3	6.26
Tractor Truck 5th Wheel	D	1	3	3.13	9.39	5	46.95	9.39	22	206.58	9.39	5	46.95	9.39
Trucks - Pickup 3/4 ton	G	3	0.5	0.78	1.17	10	11.7	1.17	22	25.74	1.17	22	25.74	1.17
Trucks - 3 ton (vendors)	D	2	0.5	1.56	1.56	20	31.2	1.56	22	34.32	1.56	10	15.6	1.56
Diesel Powered Welder	D	1	6	1.27	7.62		0			0		22	167.64	7.62
Light Plants	D	0	8	1.27	0.00		0			0			0	
Portable Compaction - Vibratory Plate	G	1	6	0.25	1.50		0		10	15	1.5	10	15	1.5
Portable Compaction - Vibratory Ram	D	1	6	0.25	1.50		0		10	15	1.5	10	15	1.5
Articulating Boom Platform	D	2	4	0.25	2.00		0			0		22	44	2
Pumps (will use elec.)	G	0	8	0.13	0.00	0	0		0	0		0	0	
Air Compressor 185 CFM	D	1	6	1.27	7.62		0			0		10	76.2	7.62
Air Compressor 750 CFM	D	0	8	1.27	0.00		0			0			0	
Concrete Vibrators (will use elec.)	D	0	8	0.25	0.00		0		0	0		0	0	
Concrete Trowel Machine	D	1	2	1.27	2.54		0		5	12.7	2.54	5	12.7	2.54
Fusion Welder	D	0	8	1.27	0.00		0			0			0	
Portable Power Generators	G	3	8	0.45	10.80		0		22	237.6	10.8	22	237.6	10.8
Total =					746		3728	339		8280.86	592.98		4617.37	362

Gasoline

Monthly Site Construction Equipment Use
Riverside Energy Resource Center Project

1

Equipment	January Days	January Gal/ month	January Gal/day	February Days	February Gal/ month	February Gal/day	March Days	March Gal/ month	March Gal/day	April Days	April Gal/ month	April Gal/day	May Days	May Gal/ month	May Gal/day
Truck Crane - Greater than 300 ton	10	450	45		0			0			0			0	
Truck Crane - Greater than 200 ton		0		15	0	0		0			0			0	
Crane - Mobile 65 ton	20	320	16	15	240	16	10	160	16		0			0	
Cranes - Mobile 45 ton	5	120	24	5	120	24	5	120	24		0			0	
Cranes - Mobile 35 ton		0			0		20	320	16	10	160	16		0	
Bulldozer D10R		0			0			0			0			0	
Bulldozer D4C		0			0			0			0			0	
Excavator - Trencher (CAT320)	10	396	39.6		0			0			0			0	
Excavator - Earth Scraper CAT 623		0			0			0			0			0	
Excavator - Motor Grader (CAT140H)		0			0			0		10	360	36		0	
Excavator - Backhoe/loader* Days per unit or	15	450	30	10	300	30	10	300	30		0			0	
Excavator - loader		0			0			0			0			0	
Vibratory Roller		0			0			0			0			0	
Portable Compaction Roller		0			0			0		10	600	60	10	600	60
Truck - Water	22	550.88	25.04	22	550.88	25.04	22	550.88	25.04	22	550.88	25.04	0	0	
Forklift	22	660	30	22	660	30	22	660	30	22	660	30	10	300	30
Dump Truck	5	31.3	6.26	5	31.3	6.26		0			0			0	
Service Truck - 1 ton	22	34.32	1.56	10	15.6	1.56	10	15.6	1.56		0			0	
Truck - Fuel/Lube	22	137.72	6.26	22	137.72	6.26	22	137.72	6.26	22	137.72	6.26		0	
Concrete Pumper Truck	3	18.78	6.26		0			0			0			0	
Tractor Truck 5th Wheel	10	93.9	9.39	10	93.9	9.39	10	93.9	9.39		0			0	
Trucks - Pickup 3/4 ton	22	25.74	1.17	22	25.74	1.17	22	25.74	1.17	22	25.74	1.17	10	11.7	1.17
Trucks - 3 ton (vendors)	10	15.6	1.56	10	15.6	1.56		0			0			0	
Diesel Powered Welder	22	167.64	7.62	22	167.64	7.62	22	167.64	7.62		0			0	
Light Plants		0			0			0			0			0	
Portable Compaction - Vibratory Plate		0			0			0		10	15	1.5	10	15	1.5
Portable Compaction - Vibratory Ram		0			0			0			0			0	
Articulating Boom Platform	22	44	2	22	44	2		0			0			0	
Pumps (will use elec.)		0			0			0			0			0	
Air Compressor 185 CFM	22	167.64	7.62	15	114.3	7.62	15	114.3	7.62	15	114.3	7.62		0	
Air Compressor 750 CFM		0			0			0			0			0	
Concrete Vibrators (will use elec.)	0	0			0			0			0			0	
Concrete Trowel Machine	3	7.62	2.54		0			0			0			0	
Fusion Welder		0			0			0			0			0	
Portable Power Generators	22	237.6	10.8	22	237.6	10.8	22	237.6	10.8	22	237.6	10.8	10	108	10.8
Total =		3929	273		2754	179		2903	185		2861	194		1035	103

Gasoline

Monthly Site Construction Equipment Use
Riverside Energy Resource Center Project

	June				
Equipment	Days	Gal/ month	Gal/day	Total Project Fuel Use	Total Project Operating Hours
Truck Crane - Greater than 300 ton		0		1125	150
Truck Crane - Greater than 200 ton		0		0	0
Crane - Mobile 65 ton		0		720	180
Cranes - Mobile 45 ton		0		360	90
Cranes - Mobile 35 ton		0		480	120
Bulldozer D10R		0		4005	180
Bulldozer D4C		0		0	0
Excavator - Trencher (CAT320)		0		1188	180
Excavator - Earth Scraper CAT 623		0		2025	180
Excavator - Motor Grader (CAT140H)		0		1296	216
Excavator - Backhoe/loader* Days per unit or		0		2460	984
Excavator - loader		0		750	150
Vibratory Roller		0		0	0
Portable Compaction Roller		0		2520	252
Truck - Water		0		3856.16	1232
Forklift		0		3900	1560
Dump Truck	5	31.3	6.26	431.94	138
Service Truck - 1 ton		0		134.16	86
Truck - Fuel/Lube		0		888.92	284
Concrete Pumper Truck		0		81.38	26
Tractor Truck 5th Wheel		0		582.18	186
Trucks - Pickup 3/4 ton	10	11.7	1.17	189.54	243
Trucks - 3 ton (vendors)		0		112.32	72
Diesel Powered Welder		0		670.56	528
Light Plants		0		0	0
Portable Compaction - Vibratory Plate		0		60	240
Portable Compaction - Vibratory Ram		0		30	120
Articulating Boom Platform		0		132	528
Pumps (will use elec.)		0		0	0
Air Compressor 185 CFM		0		586.74	462
Air Compressor 750 CFM		0		0	0
Concrete Vibrators (will use elec.)		0		0	0
Concrete Trowel Machine		0		33.02	26
Fusion Welder		0		0	0
Portable Power Generators	10	108	10.8	1641.6	3648
Total =		151	18	30260	12061

Gasoline

Site Daily Combustion Equipment Operating Schedule
Riverside Energy Resource Center Project

						November Earthmoving Phase			November Construction Phase			December Construction Phase		
Equipment	**Gasoline/ Diesel**	**Number of Units**	**Hrs/Day Per Unit**	**Gals/Hr Per Unit**	**Total Fuel Use (Gals/day)**	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day
Truck Crane - Greater than 300 ton	D	1	6	7.50	45.00		0			0		15	675	45
Truck Crane - Greater than 200 ton	D	0	0	5.00	0.00		0			0			0	
Crane - Mobile 65 ton	D	1	4	4.00	16.00		0			0			0	
Cranes - Mobile 45 ton	D	1	6	4.00	24.00		0			0			0	
Cranes - Mobile 35 ton	D	1	4	4.00	16.00		0			0			0	
Bulldozer D10R	D	1	6	22.25	133.50	15	2002.5	133.5		0			0	
Bulldozer D4C	D	0	0	3.00	0.00		0			0			0	
Excavator - Trencher (CAT320)	D	1	6	6.60	39.60	15	594	39.6		0		10	396	39.6
Excavator - Earth Scraper	D	2	6	11.25	135.00	15	2025	135		0			0	
Excavator - Motor Grader (CAT140H)	D	1	6	6.00	36.00	20	720	36		0		8	288	36
Excavator - Backhoe/loader* Days per unit	D	2	6	2.50	30.00	0	0		10	300	30	22	660	30
Excavator - loader (CAT928)	D	1	6	5.00	30.00	0	0		10	300	30	10	300	30
Vibratory Roller	D	1	6	10.00	60.00	20	1200	60		0			0	
Portable Compaction Roller	D	1	6	10.00	60.00	12	720	60	0	0		5	300	60
Truck - Water	D	1	8	3.13	25.04	12	600.96	25.04	10	250.4	25.04	22	550.88	25.04
Forklift	D	2	6	2.50	30.00		0		10	300	30	22	660	30
Dump Truck	D	2	1	3.13	6.26	12	75.12	6.26	10	62.6	6.26	22	137.72	6.26
Service Truck - 1 ton	D	2	0.5	1.56	1.56	12	18.72	1.56	10	15.6	1.56	22	34.32	1.56
Truck - Fuel/Lube	D	1	2	3.13	6.26	12	75.12	6.26	10	62.6	6.26	22	137.72	6.26
Concrete Pumper Truck	D	1	2	3.13	6.26		0		5	31.3	6.26	5	31.3	6.26
Tractor Truck 5th Wheel	D	1	3	3.13	9.39	12	112.68	9.39	10	93.9	9.39	5	46.95	9.39
Trucks - Pickup 3/4 ton	G	3	0.5	0.78	1.17	12	14.04	1.17	10	11.7	1.17	22	25.74	1.17
Trucks - 3 ton	D	2	0.5	1.56	1.56	12	18.72	1.56	10	15.6	1.56	10	15.6	1.56
Diesel Powered Welder	D	1	6	1.27	7.62		0			0		22	167.64	7.62
Light Plants	D	0	8	1.27	0.00		0			0			0	
Portable Compaction - Vibratory Plate	G	1	6	0.25	1.50		0		10	15	1.5	10	15	1.5
Portable Compaction - Vibratory Ram	D	1	6	0.25	1.50		0		10	15	1.5	10	15	1.5
Articulating Boom Platform	D	2	4	0.25	2.00		0			0		22	44	2
Pumps	G	0	8	0.13	0.00		0		5	0	0	5	0	0
Air Compressor 185 CFM	D	1	6	1.27	7.62		0			0		10	76.2	7.62
Air Compressor 750 CFM	D	0	8	1.27	0.00		0			0			0	
Concrete Vibrators	D	0	8	0.25	0.00		0		5	0	0	5	0	0
Concrete Trowel Machine	D	1	2	1.27	2.54		0		5	12.7	2.54	5	12.7	2.54
Fusion Welder	D	0	8	1.27	0.00		0			0			0	
Portable Power Generators	D	3	8	0.45	10.80	12	129.6	10.8	10	108	10.8	22	237.6	10.8
Total =					746		8306	**526**		1594	**164**		4827	**362**

Site Combustion Emissions - November Grading Phase

			Base Factors g/bhp, if Tier 1 >50 hp (1)						Appendix A Table A3 Adjustment (2)							Adjustment (3)	Adjusted Factors					
Equipment	HP Cat.	Tier	BSFC lb/hp-hr	NOx	CO	POC	SOx	PM10	Adj. Type	NOx	CO	POC	SOx	PM10		PM10 Fuel S	BSFC	NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	None	1	1	1	1	1		-0.086	0.367	5.58	0.75	0.31	0.0049	0.17
Crawler Crane- Greater than 200 ton	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	None	1	1	1	1	1		-0.086	0.367	5.58	0.75	0.31	0.0049	0.17
Crane - Mobile 65 ton	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	None	1	1	1	1	1		-0.086	0.367	5.58	0.75	0.31	0.0049	0.17
Cranes -Mobile 45 ton	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	None	1	1	1	1	1		-0.086	0.367	5.65	0.87	0.34	0.0049	0.19
Cranes - Mobile 35 ton	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	None	1	1	1	1	1		-0.086	0.367	5.65	0.87	0.34	0.0049	0.19
Bulldozer D10R	300-600	1	0.367	6.0153	1.306	0.2025	0.00499	0.2008	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.71	2.00	0.21	0.0049	0.16
Bulldozer D4C	50-100	1	0.408	5.5988	2.3655	0.5213	0.00555	0.473	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.099	0.412	5.32	3.62	0.55	0.0055	0.49
Excavator- Trencher (CAT 320)	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.37	1.33	0.36	0.0049	0.26
Excavator- Earth Scraper	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.30	1.14	0.32	0.0049	0.22
Excavator-Motor Grader (CAT140H)	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.30	1.14	0.32	0.0049	0.22
Excavator- Backhoe/loader	50-100	1	0.408	5.5988	2.3655	0.5213	0.00555	0.473	Lo LF	1.1	2.57	2.29	1.18	1.97		-0.113	0.481	6.16	6.08	1.19	0.0064	0.82
Excavator - loader (CAT928)	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.37	1.33	0.36	0.0049	0.26
Vibratory Roller	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.37	1.33	0.36	0.0049	0.26
Portable Compaction roller	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.087	0.371	5.30	1.14	0.32	0.0049	0.22
Truck- Water	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Forklift	50-100	1	0.408	5.5988	2.3655	0.5213	0.00555	0.473	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.099	0.412	5.32	3.62	0.55	0.0055	0.49
Dump Truck	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Service Truck- 1 ton	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Truck- Fuel/Lube	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Concrete Pumper Truck	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Tractor Truck 5th Wheel	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Trucks- Pickup 3/4 ton	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Trucks- 3 ton	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad		Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Diesel Powered Welder	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Lo LF	1.1	2.57	2.29	1.18	1.97		-0.094	0.40	7.59	12.85	4.12	0.0052	1.46
Light Plants	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1		-0.094	0.40	6.90	5.00	1.80	0.0053	0.71
Portable Compaction- Vibratory Plate	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1		-0.095	0.408	6.90	5.00	1.80	0.0054	0.70
Portable Compaction- Vibratory Ram	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1		-0.095	0.408	6.90	5.00	1.80	0.0054	0.70
Articulating Boom Platforms	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Lo LF	1.1	2.57	2.29	1.18	1.97		-0.113	0.481	7.59	12.85	4.12	0.0063	1.46
Pumps	Gasoline	na	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline		Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Air Compressor 185 CFM	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1		-0.094	0.40	6.90	5.00	1.80	0.0053	0.71
Air Compressor 750 CFM	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1		-0.094	0.40	6.90	5.00	1.80	0.0053	0.71
Concrete Vibrators	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.096	0.412	6.56	7.65	1.89	0.0054	0.89
Concrete Trowel Machine	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Hi LF	0.95	1.53	1.05	1.01	1.23		-0.096	0.412	6.56	7.65	1.89	0.0054	0.89
Fusion Welder	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Lo LF	1.1	2.57	2.29	1.18	1.97		-0.113	0.481	7.59	12.85	4.12	0.0063	1.46
Portable Power Generators	Gasoline	na	Gasoline	10	400	2	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline		Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline

Site Combustion Emissions - November Grading Phase

Equipment	Tier	Adjusted factors lbs/gallon (4) NOx	CO	POC	SOx	PM10	Total Fuel Use (Gals/day)	Daily Emissions Lbs/day (November - High Fuel Consumption Earthmoving Phase) NOx	CO	POC	SOx	PM10	Total Fuel Use (Gals/yr)	Annual Emissions Lbs/yr (Based upon projected project fuel consumption) NOx	CO	POC	SOx	PM10
Truck Crane- Greater than 300 ton	1	237.87	31.88	13.16	0.21	7.09	0	0.00	0.00	0.00	0.00	0.00	1125	267.60	35.87	14.80	0.23	7.98
Truck Crane- Greater than 200 ton	1	237.87	31.88	13.16	0.21	7.09	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Crane - Mobile 65 ton	1	237.87	31.88	13.16	0.21	7.09	0	0.00	0.00	0.00	0.00	0.00	720	171.26	22.95	9.47	0.15	5.11
Cranes -Mobile 45 ton	1	241.07	36.96	14.43	0.21	8.26	0	0.00	0.00	0.00	0.00	0.00	360	86.79	13.31	5.20	0.07	2.98
Cranes - Mobile 35 ton	1	241.07	36.96	14.43	0.21	8.26	0	0.00	0.00	0.00	0.00	0.00	480	115.71	17.74	6.93	0.10	3.97
Bulldozer D10R	1	241.31	84.38	8.98	0.21	6.77	133.5	32.22	11.26	1.20	0.03	0.90	4005	966.45	337.94	35.98	0.83	27.10
Bulldozer D4C	1	202.03	137.47	20.79	0.21	18.44	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Excavator- Trencher	1	226.75	56.00	15.00	0.21	10.88	39.6	8.98	2.22	0.59	0.01	0.43	1188	269.38	66.52	17.83	0.25	12.92
Excavator- Earth Scraper	1	223.74	48.29	13.68	0.21	9.43	135	30.20	6.52	1.85	0.03	1.27	2025	453.07	97.80	27.76	0.42	19.10
Excavator-Motor Grader	1	223.74	48.29	13.68	0.21	9.43	36	8.05	1.74	0.49	0.01	0.34	1296	289.96	62.59	17.73	0.27	12.22
Excavator- Backhoe/loader	1	200.23	197.65	38.81	0.21	26.63	0	0.00	0.00	0.00	0.00	0.00	2460	492.57	486.22	95.48	0.51	65.52
Excavator - loader	1	226.75	56.00	15.00	0.21	10.88	0	0.00	0.00	0.00	0.00	0.00	750	170.06	42.00	11.25	0.16	8.16
Vibratory Roller	1	226.75	56.00	15.00	0.21	10.88	60	13.60	3.36	0.90	0.01	0.65	0	0.00	0.00	0.00	0.00	0.00
Portable Compaction roller	1	223.74	48.29	13.68	0.21	9.43	60	13.42	2.90	0.82	0.01	0.57	2520	563.62	121.70	34.47	0.52	23.77
Truck- Water	na	170.68	106.79	15.33	0.21	9.59	25.04	4.27	2.67	0.38	0.01	0.24	3856.16	658.18	411.79	59.10	0.81	36.99
Forklift	1	202.03	137.47	20.79	0.21	18.44	0	0.00	0.00	0.00	0.00	0.00	3900	787.93	536.15	81.09	0.81	71.90
Dump Truck	na	170.68	106.79	15.33	0.21	9.59	6.26	1.07	0.67	0.10	0.00	0.06	431.94	73.72	46.13	6.62	0.09	4.14
Service Truck- 1 ton	na	74.40	59.47	5.57	0.21	4.83	1.56	0.12	0.09	0.01	0.00	0.01	134.16	9.98	7.96	0.75	0.03	0.65
Truck- Fuel/Lube	na	170.68	106.79	15.33	0.21	9.59	6.26	1.07	0.67	0.10	0.00	0.06	888.62	151.72	94.92	13.62	0.19	8.53
Concrete Pumper Truck	na	170.68	106.79	15.33	0.21	9.59	0	0.00	0.00	0.00	0.00	0.00	81.38	13.89	8.69	1.25	0.02	0.78
Tractor Truck 5th Wheel	na	170.68	106.79	15.33	0.21	9.59	9.38	1.60	1.00	0.14	0.00	0.09	582.18	99.37	62.17	8.92	0.12	5.58
Trucks- Pickup 3/4 ton	na	62.81	677.30	48.28	0.27	1.56	1.17	0.07	0.79	0.05	0.00	0.00	189.54	11.91	128.38	8.77	0.05	0.30
Trucks- 3 ton	na	74.40	59.47	5.57	0.21	4.83	1.56	0.12	0.09	0.01	0.00	0.01	112.32	8.36	6.68	0.63	0.02	0.54
Diesel Powered Welder	0	297.01	502.84	161.30	0.20	58.01	0	0.00	0.00	0.00	0.00	0.00	670.56	199.16	337.18	108.16	0.14	38.90
Light Plants	0	270.01	195.66	70.44	0.21	27.64	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Portable Compaction- Vibratory Plate	0	264.71	191.82	69.06	0.21	27.03	0	0.00	0.00	0.00	0.00	0.00	60	15.88	11.51	4.14	0.01	1.62
Portable Compaction- Vibratory Ram	0	264.71	191.82	69.06	0.21	27.03	0	0.00	0.00	0.00	0.00	0.00	30	7.94	5.75	2.07	0.01	0.81
Articulating Boom Platforms	0	246.77	417.78	134.01	0.20	47.58	0	0.00	0.00	0.00	0.00	0.00	132	32.57	55.15	17.69	0.03	6.28
Pumps	na	79.44	13813.38	748.58	0.27	2.35	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Air Compressor 185 CFM	0	270.01	195.66	70.44	0.21	27.64	0	0.00	0.00	0.00	0.00	0.00	586.74	158.42	114.80	41.33	0.12	16.22
Air Compressor 750 CFM	0	270.01	195.66	70.44	0.21	27.64	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Concrete Vibrators	0	248.99	290.58	71.79	0.21	33.71	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Concrete Trowel Machine	0	248.99	290.58	71.79	0.21	33.71	0	0.00	0.00	0.00	0.00	0.00	33.02	8.22	9.59	2.37	0.01	1.11
Fusion Welder	0	246.77	417.78	134.01	0.20	47.58	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Portable Power Generators	0	144.44	5777.78	28.89	0.27	2.35	10.8	1.56	62.40	0.31	0.00	0.03	1641.6	237.12	9484.80	47.42	0.44	3.85
							526						30280					

	Totals	116.38	96.39	6.96	0.11	4.66		6321.05	12626.30	680.74	6.41	387.04
							Tons/yr	3.16	6.31	0.34	0.00	0.19

(1) - Steady State Emission Factors from Table A2 of EPA November 2002 NR-009b Publication.
(2) - In use adjustment factors per Table A3 EPA November 2002 NR-009b Publication.
(3) - PM10 and SO2 adjustments due to Equation 5 and Equation 7 on pages 18 and 19, Respectively of EPA Report No. NR-009b
(4) - Calculation uses adjusted BSFC and assumed 7.1 lbs/gallon. The onroad and gasoline powered pump emission factors are not adjusted, except for SO2 adjusted for pumps per the gasoline powered 3/4 ton pickup value.

On-Site Fugitive Construction Emissions During Grading Operations

On-site Vehicle Travel on Unpaved Roads

PM10 (lb) = VMT x F x (1-water suppression control efficiency)

$F = 2.1 \times (G/12) \times (H/30) \times ((I/3)^{0.7}) \times ((J/4)^{0.5}) \times ((365-K)/365)$ in lb/mile traveled

Truck Type		Trips or Hours / November Peak Day	Trips / Hours per Project	VMT/Trip or hour (onsite)	VMT/Day (onsite)	VMT/Project (onsite)	G (Silt Loading %)	H (Mean Vehicle Speed MPH)	I (Mean Vehicle Weight tons)	J (# Wheels)	K (# days/year w/ 0.01 inch precipitation)	F Uncontrolled Emission Factor (lb/VMT)	Daily Water Suppression Control Efficiency	Annual Water Suppression Control Efficiency	Peak November Daily Emissions (lbs)	Project Emissions (lbs)
Dump Trucks (2 trucks 1 trips/day each, through Jan (59 days), 2 trucks, 3 trips each > Jan (10days) to center of Region 2	round trips	2	708	0.530	1.061	375.456	13.2	5	22.7	10	10	2.44118	85%	85%	0.39	137.48
Service Trucks / Utility vehicles/ misc deliv. (2 trips/day during earthmoving, 6 trips per day project average)	round trips	2	828	0.492	0.985	408	10.0	10	4	6	10	0.84987	85%	85%	0.13	51.98
Crew / Visitor Passenger Vehicles (5 employees, 5 visitors per day during grading. 75 employees (average), 1.5 persons per vehicle 10 visitors/day remainder of project. Parking in volume source #3 region.	round trips	5	9240	0.492	2.462	4550	10.0	10	2	4	10	0.42716	85%	85%	0.16	291.54
Tractor Trailer Trucks (heavy equipment / concrete deliveries) No delivery in Oct or Nov. 255 project deliveries 90% in Dec/Jan. 10% to region #1, 90% to region #2	round trips	0	255	0.568	0	145	10.0	10	27	18	10	6.60310	85%	85%	0.00	121.77
Water Truck operating 45 minutes per hour, 7 months, 22 day/month (75% adj for annual use)	hours	8	924	3.75	30	3465	13.2	5	29	10	10	2.89774	85%	85%	13.04	1506.10
Scraper 2 trucks, 6 hrs each, 20% transit, 15 days	hours	2.4	36	2	4.8	72	7.2	7.5	40.92	10	10	3.01707	85%	85%	2.17	32.58
Total															15.88	2141.45
				Roundtrip, Water Truck VMT reflects project Excavation, Other vehicles - estimated average round trip distance from fence to on-site destination			*Gravel surface = 4.0 Untreated surface = 13.2*	*SCAQMD CEQA Table A-9-9-D-2 for passenger, reasonable estimate for HD, increased per CEC guidance*	*SCAQMD CEQA Table A9-9-D3 or actual known typical weights*	*SCAQMD CEQA Table A9-9-D3*	*SCAQMD CEQA A9-9-D-4 (drought SCAB)*					

** Roadway, source #3 region and source #2 region graveled after grading. Travel Distance to Area Source #3 = 2600 ft round trip. Service trucks to region 3.*

Note: Dirt pushing emission factors used below reflect both blade and tire emissions.

On-Site Fugitive Construction Emissions During Grading Operations

Dirt Pushing / Bulldozing Operations

$E = ((0.45 \times (((G)^{1.5})/((H)1.4))) \times I) * J^{*}.75$

E = PM_{10} Emissions from Dirt Pushing
G = Silt content of aggregate in percent
H = Moisture Content of the surface material
I = 2.2046 - conversion factor from kg/hr to lb/hr
J = Hours of pushing operation per day
0.75 = PM10:PM15 per EPA AP-42 11.9, table 1

Truck Type	G (Silt Content %)	H (Moisture Content)	J (Hours of pushing operation/day)	Hours of pushing operation/ project	Daily PM_{10} Emissions (lb)	Project PM_{10} Emissions (lb)
Excavator - Motor Grader (CAT 140H) 75% pushing	7.2	15	4.5	162	1.46	70.07
Excavator - Backhoe/loader (Caterpillar 430D) 50% pushing	7.2	15	6	75	1.95	32.44
Excavator - Loader (Caterpillar 928 loader) 50% pushing	7.2	15	3	75	0.97	32.44
Bulldozer - D10 50% pushing	7.2	15	3	90	0.97	38.93
Scraper - 50% utilization	7.2	15	6	144	1.95	62.28
Total					7.30	173.88
Source:	LOR Sieve Tests	*SCAQMD CEQA Table A9-9-F-2*				

On-Site Fugitive Construction Emissions During Grading Operations

Wind Erosion

$E = \{(1.7 \times (G/1.5) \times [(365-H)/235] \times (I/15)) \times J) \times (1-\text{control efficiency})$

E = PM_{10} Emissions from wind erosion in pounds per acre

G = Silt content of aggregate in percent

H = Number of Days with ≥ 0.25 mm (0.01 inch) of precipitation per year

I = Percentage of time that unobstructed wind speed exceeds 12 mph or 5.4 mps at mean pile height

J = Fraction of Total Suspended Particulate which is estimated at 0.5

Control Efficiency 68%

Location	G (Silt Content %)	H (# days >0.01 inch precipitation)	I (% of time wind speed >12 mph)	Number of days during project	Daily PM_{10} Emissions per Acre (lbs)	Daily PM_{10} Emissions (13 acres)	Project PM_{10} Emissions per Acre (lbs)	Project PM_{10} Emissions (11 acres)
13 acres	13.2	10	1.7	160	0.0041	0.053	0.656	7.212
Source:	LDR Sieve Tests	*SCAQMD CEQA Table A9-9-E-2 (worst case - SCAB /drought)*	*November time is 9 hours. Average for Oct - Dec is 0.92% Selected annual average is be prudent.*					

On-Site Fugitive Construction Emissions During Grading Operations

Dirt Loading/Piling

$E = [0.00112 \times ([(G/5)^{1.3}]/[(H/2)^{1.4}])] \times [I/J]$

E = PM_{10} Emissions from dirt loading/handling

G = Mean wind speed in miles per hour

H = Moisture content of surface material

I = Pounds of dir loaded or handled per day

J = 2,000; convert lbs of dirt to tons of dirt

	m/s	mph
G	1.894	4.24

Location	G (Mean wind speed mph)	H (Moisture content)	I (Lbs of dirt handled/day)	Number of days during project	Daily PM_{10} Emissions (lbs)	Project PM_{10} Emissions (lbs)
Loader Operations, load 3 trucks per day (or to piles)	4.24	15	120,000	45	2.04	91.62
	High of October and November	*SCAQMD CEQA Table A9-9-G-1*				
Scraper Drop Operations						
Uncontrolled TSP (lb/day) = TSP (lb) * PM10 fraction * tons handled (AP-42-11.9-4)	AP-42 11.9.4 factor (lb TSP /ton)	PM10/TSP	I (Lbs of dirt handled/day)	Number of days during project	Daily PM_{10} Emissions (lbs)	Project PM_{10} Emissions (lbs)
	0.04	0.4893	1,200,000	15	11.74	176.15
				total	13.78	267.77
Source:		CARB CEIDARS 9-26-02	*scraper volume per TIC*			

Fugitive PM10 Emissions - Travel on Paved Roads

E = V x F

E = PM_{10} Emissions from travel on paved roads
V = Vehicle miles traveled = W x X
W = Travel distance in miles
X = Number of Vehicles
F = Emission factor for travel on paved roads (Table A9 -9-B-1 for passenger vehicles))

Vehicle Type	Total number of vehicles	Travel Distance (miles)	Vehicle miles traveled/day	Number of Project days	G (Paved Road silt content)	F (Emission Factor)	Daily PM_{10} Emissions (lbs)	Project PM_{10} Emissions (lbs)
Passenger vehicle	60	40	2400	154	na	0.0021	5.12	789.10
Truck	12	30	360	154	0.0041	0.11	38.85	5982.63
					Per CURE Comment			
Source:					SCAQMD CEQA Table A-9-C-1, 5% local, 5% collector, 90% freeway	SCAQMD CEQA Guide Table A9-9-B-1 Passenger - 5% local st, 5% collector st, 90% freeway		

Boulder Blasting		
Total Boulder Mass (Tons)	600	Per Contractor Estimate
Mass of Boulders to Break (Tons)	300	
Duration (days)	1	
Uncontrolled PM10 Factor (lb/ton)	0.0008	MDAQMD Permit Guidance for Mineral Extracting Industry Assumes wet drilling, no other controls
	lb/day Process to be done in October	lb/project
Blasting PM10	0.24	0.24

Emissions from On-Road Vehicle Travel

Construction Vehicle (Mobile Source) Emission Factors

Vehicle Travel	CO	VOC	NOx	SOx	PM10 Exh.	PM10 - tire/break
	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile	lb/mile
Offsite (Heavy Duty Trucks - Diesel)	0.00582	0.00121	0.0395	0.00039	0.00069	0.000092
Offsite (Construction Worker Vehicle)	0.01636	0.00172	0.0018	0.00001	0.00003	0.000045

Source: CARB's EMFAC2002 V2.2, 2004 (Winter)

Passenger vehicle emission rates reflect 50% light duty passenger cars and 50% light duty trucks.

Construction Vehicle Number of Onroad Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	No. of One-Way Trips/Project	One Way Trip Length (miles)	
Offsite (Heavy Duty Trucks) 12 haul trips/day earthmoving phase,	12	1848	15	
Offsite (Construction Worker) 22 day/mo., 7 mo. 75 avg workers, 1.5 people per vehicle, 10 visitors	60	9240	20	*Local hiring emphasis*

Onroad Emissions - Daily Max.

	CO	VOC	NOx	SOx	PM10 Exh.	PM10 - tire/break	Total PM10
Offsite (Heavy Duty Trucks - Diesel)	2.1	0.4	14.2	0.1	0.2	0.0	0.3
Offsite (Construction Worker, visitor Vehicl	39.3	4.1	4.3	0.0	0.1	0.1	0.2
Total Daily Onroad Emissions (lb/day)	41.4	4.6	18.5	0.2	0.3	0.1	0.5

Onroad Emissions - Project Totals

	CO	VOC	NOx	SOx	PM10 Exh.	PM10 - tire/break	Total PM10
Offsite (Heavy Duty Trucks - Diesel)	323	67	2190	22	38	5	43
Offsite (Construction Worker Vehicle)	6047	636	665	4	11	17	28
Total Daily Onroad Emissions (lb/project)	6369	703	2855	25	49	22	71

City of Riverside ERC
Transmission Line Daily Maximum Construction-Related Emissions (lb/day)
February

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	18.09	13.95	2.53	0.02	1.154
Unpaved Road Travel Fugitive PM Emissions					0.001
Grading / Bulldozing Fugitive PM Emissions					0.215
Earth Loading Fugitive PM Emissions					0.050
Disturbed Soil Wind Erosion PM Emissions *(project total / 55 days)*					0.017
Total Max. Pounds per Day	**18.09**	**13.95**	**2.53**	**0.02**	**1.437**

City of Riverside ERC
Transmission Line Project On-site Construction Emissions
(lbs/project)

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	784	549	87	1	43.651
Unpaved Road Travel Fugitive PM Emissions					0.070
Grading / Bulldozing Fugitive PM Emissions					11.810
Earth Loading Fugitive PM Emissions					2.255
Disturbed Soil Wind Erosion PM Emissions					0.924
Total Pounds per Project	**784**	**549**	**87**	**1**	**58.7**
Total Tons per Project	**0.392**	**0.275**	**0.044**	**0.000**	**0.029**

Transmission Line Construction Combustion Emissions
Riverside Energy Resource Center Project

Equipment	Gasoline/ Diesel	Number of Units	Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)	January			February			March			Total Project Fuel Use	Total Project Operating Hours
						Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day		
Truck Crane - Greater than 300 ton	D	0	0	7.50	0.00		0			0			0		0	0
Truck Crane - Greater than 200 ton	D	0	0	5.00	0.00		0			0			0		0	0
Crane - Mobile 65 ton	D	0	0	4.00	0.00		0			0			0		0	0
Cranes - Mobile 45 ton	D	0	0	4.00	0.00		0			0			0		0	0
Cranes - Mobile 35 ton	D	1	6	4.00	24.00	15	360	24	20	480	24	20	480	24	1320	330
Bulldozer D6H	D	0	0	5.50	0.00		0			0			0		0	0
Bulldozer D4C	D	0	0	3.00	0.00	0	0		0	0		0	0		0	0
Auger	D	1	2	2.00	4.00	20	80	20	4	16	4	15	60	4	156	78
Excavator - Earth Scraper	D	0	0	9.00	0.00		0			0			0		0	0
Excavator - Motor Grader	D	0	0	5.00	0.00		0			0			0		0	0
Excavator - Backhoe/loader	D	1	2	2.50	5.00	15	75	5	20	100	5	15	75	5	250	100
Excavator - loader	D	0	0	2.50	0.00		0			0			0		0	0
Vibratory Roller	D	1	2	10.00	20.00	0	0		0	0		0	0		0	0
Portable Compaction Roller	D	0	0	10.00	0.00		0			0			0		0	0
Truck - Water	D	1	1	3.13	3.13	15	46.95	3.13	20	62.6	3.13	20	62.6	3.13	172.15	55
Forklift	D	0	0	2.50	0.00		0			0			0		0	0
Dump Truck	D	1	6	3.13	18.78	15	281.7	18.78	20	375.6	18.78	20	375.6	18.78	1032.9	330
Service Truck - 1 ton -	D	1	6	1.56	9.36	15	140.4	9.36	20	187.2	9.36	10	93.6	9.36	421.2	270
Truck - Fuel/Lube	D	0	0	3.13	0.00	0	0			0			0		0	0
Concrete Pumper Truck	D	1	3	3.13	9.39	15	140.85	9.39	20	187.8	9.39	20	187.8	9.39	516.45	165
Tractor Truck 5th Wheel	D	0	0	3.13	0.00	0	0		0	0		0	0		0	0
Trucks - Pickup 3/4 ton	G	3	3	0.78	7.02	20	140.4	7.02	20	140.4	7.02		0		280.8	360
Trucks - 3 ton delivery	D	1	1	1.56	1.56	4	6.24	1.56	4	6.24	1.56	4	6.24	1.56	18.72	12
Diesel Powered Welder	D	1	1	1.27	1.27	15	19.05	1.27	20	25.4	1.27	10	12.7	1.27	57.15	45
Light Plants	D	0	0	1.27	0.00		0			0			0		0	0
Portable Compaction - Vibratory Plate	G	1	2	0.25	0.50		0			0			0		0	0
Portable Compaction - Vibratory Ram	D	0	0	0.25	0.00		0			0			0		0	0
Articulating Boom Platform	D	0	0	0.25	0.00	0	0		0	0			0		0	0
Pumps	G	0	0	0.13	0.00		0			0			0		0	0
Air Compressor 185 CFM	D	1	1	1.27	1.27	15	19.05	1.27	20	25.4	1.27	20	25.4	1.27	69.85	55
Air Compressor 750 CFM	D	0	0	1.27	0.00		0			0			0		0	0
Concrete Vibrators	D	0	0	0.25	0.00	0	0			0			0		0	0
Concrete Trowel Machine	D	0	0	1.27	0.00	0	0			0			0		0	0
Fusion Welder	D	0	0	1.27	0.00		0			0			0		0	0
Portable Power Generators	D	0	0	1.27	0.00		0			0			0		0	0
Total =					105		1310	101		1607	85		1379	78	4295	1800

Transmission Line Combustion Emissions - High February Daily & Project Total

			Base Factors g/bhp, if Tier 1 >50 hp (1)						Appendix A Table A3 Adjustment (2)						Adjustment (3)	Adjusted Factors					
Equipment	HP Cat.	Tier	BSFC lb/hp-hr	NOx	CO	POC	SOx	PM10	Adj. Type	NOx	CO	POC	SOx	PM10	PM10 Fuel S	BSFC	NOx	CO	POC	SOx	PM10
Crawler Crane- Greater than 300 ton	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	None	1	1	1	1	1	-0.086	0.367	5.58	0.75	0.31	0.0049	0.17
Crawler Crane- Greater than 200 ton	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	None	1	1	1	1	1	-0.086	0.367	5.58	0.75	0.31	0.0049	0.17
Crane - Mobile 65 ton	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	None	1	1	1	1	1	-0.086	0.367	5.58	0.75	0.31	0.0049	0.17
Cranes -Mobile 45 ton	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	None	1	1	1	1	1	-0.086	0.367	5.65	0.87	0.34	0.0049	0.19
Cranes - Mobile 35 ton	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	None	1	1	1	1	1	-0.086	0.367	5.65	0.87	0.34	0.0049	0.19
Bulldozer D10R	300-600	1	0.367	6.0153	1.308	0.2025	0.00499	0.2008	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.71	2.00	0.21	0.0049	0.16
Bulldozer D4C	50-100	1	0.408	5.5988	2.3655	0.5213	0.00555	0.473	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.096	0.412	5.32	3.62	0.55	0.0055	0.49
Excavator- Trencher (CAT 320)	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.37	1.33	0.36	0.0049	0.26
Excavator- Earth Scraper	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.30	1.14	0.32	0.0049	0.22
Excavator-Motor Grader (CAT140H)	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.30	1.14	0.32	0.0049	0.22
Excavator- Backhoe/loader	50-100	1	0.408	5.5988	2.3655	0.5213	0.00555	0.473	Lo LF	1.1	2.57	2.29	1.18	1.97	-0.113	0.481	6.16	6.08	1.19	0.0064	0.82
Excavator - loader (CAT928)	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.37	1.33	0.36	0.0049	0.26
Vibratory Roller	100-175	1	0.367	5.6523	0.8667	0.3384	0.00499	0.2799	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.37	1.33	0.36	0.0049	0.26
Portable Compaction roller	175-300	1	0.367	5.5772	0.7475	0.3085	0.00499	0.2521	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.087	0.371	5.30	1.14	0.32	0.0049	0.22
Truck- Water	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Forklift	50-100	1	0.408	5.5988	2.3655	0.5213	0.00555	0.473	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.096	0.412	5.32	3.62	0.55	0.0055	0.49
Dump Truck	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Service Truck- 1 ton	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Truck- Fuel/Lube	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Concrete Pumper Truck	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Tractor Truck 5th Wheel	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Trucks- Pickup 3/4 ton	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Trucks- 3 ton	Onroad	na	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad	Onroad
Diesel Powered Welder	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Lo LF	1.1	2.57	2.29	1.18	1.97	-0.094	0.40	7.59	12.85	4.12	0.0052	1.48
Light Plants	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1	-0.094	0.40	6.90	5.00	1.80	0.0053	0.71
Portable Compaction- Vibratory Plate	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1	-0.095	0.408	6.90	5.00	1.80	0.0054	0.70
Portable Compaction- Vibratory Ram	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1	-0.095	0.408	6.90	5.00	1.80	0.0054	0.70
Articulating Boom Platforms	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Lo LF	1.1	2.57	2.29	1.18	1.97	-0.113	0.481	7.59	12.85	4.12	0.0063	1.46
Pumps	Gasoline	na	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Air Compressor 185 CFM	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1	-0.094	0.40	6.90	5.00	1.80	0.0053	0.71
Air Compressor 750 CFM	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1	-0.094	0.40	6.90	5.00	1.80	0.0053	0.71
Concrete Vibrators	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.096	0.412	6.56	7.65	1.89	0.0054	0.89
Concrete Trowel Machine	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Hi LF	0.95	1.53	1.05	1.01	1.23	-0.096	0.412	6.56	7.65	1.89	0.0054	0.89
Fusion Welder	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	Lo LF	1.1	2.57	2.29	1.18	1.97	-0.113	0.481	7.59	12.85	4.12	0.0063	1.46
Portable Power Generators	25-50	0	0.408	6.9	5	1.8	0.00555	0.8	None	1	1	1	1	1	-0.095	0.408	6.90	5.00	1.80	0.0054	0.70

Transmission Line Combustion Emissions - High February Daily & Project Total

Equipment	Tier	Adjusted factors lbs/gallon (4) NOx	CO	POC	SOx	PM10	Total Fuel Use (Gals/day)	Daily Emissions Lbs/day (November - High Fuel Consumption Month) NOx	CO	POC	SOx	PM10	Total Fuel Use (Gals/yr)	Annual Emissions Lbs/yr (Based upon projected project fuel consumption) NOx	CO	POC	SOx	PM10
Truck Crane- Greater than 300 ton	1	237.87	31.88	13.16	0.21	7.09	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Truck Crane- Greater than 200 ton	1	237.87	31.88	13.16	0.21	7.09	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Crane - Mobile 65 ton	1	237.87	31.88	13.16	0.21	7.09	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Cranes -Mobile 45 ton	1	241.07	36.96	14.43	0.21	8.26	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Cranes - Mobile 35 ton	1	241.07	36.96	14.43	0.21	8.26	24	5.79	0.89	0.35	0.00	0.20	1320	318.21	48.79	19.05	0.27	10.92
Bulldozer D6H	1	241.31	84.34	8.98	0.21	6.77	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Bulldozer D4C	1	202.03	137.47	20.79	0.21	18.44	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Auger	1	226.75	56.00	15.00	0.21	10.88	4	0.91	0.22	0.06	0.00	0.04	156	35.37	8.74	2.34	0.03	1.70
Excavator- Earth Scraper	1	223.74	48.29	13.68	0.21	9.43	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Excavator-Motor Grader	1	223.74	48.29	13.68	0.21	9.43	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Excavator- Backhoe/loader	1	200.23	197.65	38.81	0.21	26.63	5	1.00	0.99	0.19	0.00	0.13	250	50.06	49.41	9.70	0.05	6.66
Excavator - loader	1	226.75	56.00	15.00	0.21	10.88	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Vibratory Roller	1	226.75	56.00	15.00	0.21	10.88	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Portable Compaction roller	1	223.74	48.29	13.68	0.21	9.43	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Truck- Water	na	170.68	106.79	15.33	0.21	9.59	3.2	0.55	0.34	0.05	0.00	0.03	172	29.36	18.37	2.64	0.04	1.65
Forklift	1	202.03	137.47	20.79	0.21	18.44	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Dump Truck	na	170.68	106.79	15.33	0.21	9.59	19	3.24	2.03	0.29	0.00	0.18	1033	176.31	110.31	15.83	0.22	9.91
Service Truck- 1 ton	na	74.40	59.47	5.57	0.21	4.83	10	0.74	0.59	0.06	0.00	0.05	421	31.32	25.03	2.34	0.09	2.03
Truck- Fuel/Lube	na	170.68	106.79	15.33	0.21	9.59	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Concrete Pumper Truck	na	170.68	106.79	15.33	0.21	9.59	10	1.71	1.07	0.15	0.00	0.10	516	88.07	55.10	7.91	0.11	4.95
Tractor Truck 5th Wheel	na	170.68	106.79	15.33	0.21	9.59	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Trucks- Pickup 3/4 ton	na	62.81	677.39	46.28	0.27	1.56	7	0.44	4.74	0.32	0.00	0.01	280	17.59	189.64	12.96	0.08	0.44
Trucks- 3 ton	na	74.40	59.47	5.57	0.21	4.83	1.6	0.12	0.10	0.01	0.00	0.01	19	1.41	1.13	0.11	0.00	0.09
Diesel Powered Welder	0	297.01	502.84	161.30	0.20	58.01	1.3	0.39	0.65	0.21	0.00	0.08	58	17.23	29.16	9.36	0.01	3.36
Light Plants	0	270.01	195.66	70.44	0.21	27.64	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Portable Compaction- Vibratory Plate	0	264.71	191.82	69.06	0.21	27.03	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Portable Compaction- Vibratory Ram	0	264.71	191.82	69.06	0.21	27.03	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Articulating Boom Platforms	0	246.77	417.78	134.01	0.20	47.58	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Pumps	na	79.44	13513.38	748.58	0.27	2.35	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Air Compressor 185 CFM	0	270.01	195.66	70.44	0.21	27.64	1.3	0.35	0.25	0.09	0.00	0.04	76	18.90	13.70	4.93	0.01	1.94
Air Compressor 750 CFM	0	270.01	195.66	70.44	0.21	27.64	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Concrete Vibrators	0	248.99	290.58	71.79	0.21	33.71	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Concrete Trowel Machine	0	248.99	290.58	71.79	0.21	33.71	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Fusion Welder	0	246.77	417.78	134.01	0.20	47.58	0	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.00	0.00
Portable Power Generators	0	264.71	191.82	69.06	0.21	27.03	10.8	2.86	2.07	0.75	0.00	0.29	0	0.00	0.00	0.00	0.00	0.00
							Totals	18.09	13.95	2.53	0.02	1.15		783.84	549.39	87.16	0.91	43.65
													Tons/yr	0.39	0.27	0.04	0.0005	0.02

(1) - Steady State Emission Factors from Table A2 of EPA November 2002 NR-009b Publication.
(2) - In use adjustment factors per Table A3 EPA November 2002 NR-009b Publication.
(3) - PM10 and SO2 adjustments due to Equation 5 and Equation 7 on pages 18 and 19, Respectively of EPA Report No. NR-009b
(4) - Calculation uses adjusted BSFC and assumed 7.1 lbs/gallon. The onroad and gasoline powered pump emission factors are not adjusted, except for SO2 adjusted for pumps per the gasoline powered 3/4 ton pickup value.

Transmission Line Fugitive Construction Emissions

On-site Vehicle Travel on Unpaved Roads

PM10 (lb) = VMT x F x (1-water suppression control efficiency)

F = 2.1 x (G/12) x (H/30) x ((I/3)$^{0.7}$) x ((J/4)$^{0.5}$) x ((365-K)/365) in lb/mile traveled

								28	35	5	6	10	9.73684				
Truck Type		Trips or Hours /day	Trips Project	VMT/Trip	VMT/Day	VMT/Project	G (Silt Loading %)	H (Mean Vehicle Speed MPH)	I (Mean Vehicle Weight tons)	J (# Wheels)	K (# days/year w/ 0.01 inch precipitation)	F Uncontrolled Emission Factor (lb/VMT)	Daily Water Suppression Control Efficiency	Annual Water Suppression Control Efficiency	Daily Emissions (lbs)
Auger		1	55	0.005	0.005	0.275	13.2	5	4	4	10	0.45799	45%	45%	0.00126
Excavator - Backhoe/loader 45 min work/hr, 10% travel during cycle	hours	2	11	0.0005	0.001	0.0055	13.2	5	2	4	10	0.28192	45%	45%	0.00016
Total															0.00141
Source							LOR Sieve Analysis		SCAQMD CEQA Table A9-9-D3 or actual known typical weights	SCAQMD CEQA Table A9-9-D3	SCAQMD CEQA A9-9-D-4 (drought SCAB)				

Dirt Pushing / Bulldozing Operations

E = ((0.45 x (((G)$^{1.5}$)/((H)1.4))) x I) * J

E = PM_{10} Emissions from Dirt Pushing
G = Silt content of aggregate in percent
H = Moisture Content of the surface material
I = 2.2046 - conversion factor from kg/hr to lb/hr
J = Hours of pushing operation per day

Truck Type	G (Silt Content %)	H (Moisture Content)	J (Hours of pushing operation/day)	Hours of pushing operation/ project	Daily PM_{10} Emissions (lb)	Project PM_{10} Emissions (lb)
Excavator - Backhoe/loader	13.2	15	0.2	11	0.2147	11.81
Total					0.2147	11.81
Source:	US EPA AP-42, 13.2.2-1, Dec. 2003 - for construction sites	SCAQMD CEQA Table A9-9-F-2	10% utilization of total operations	10% utilization of total operations, 55 days		

Transmission Line Fugitive Construction Emissions

Wind Erosion

$E = (1.7 \times [G/1.5] \times [(365-H)/235] \times [I/15]) \times J$

E = PM_{10} Emissions from wind erosion in pounds per acre
G = Silt content of aggregate in percent
H = Number of Days with $\geq$ 0.25 mm (0.01 inch) of precipitation per yea
I = Percentage of time that unobstructed wind speed exceeds 12 mph or 5.4 mps at mean pile height
J = Fraction of Total Suspended Particulates which is estimated at 0.5

Location	G (Silt Content %)	H (# days >0.01 inch precipitation)	I (% of time wind speed >12 mph)	Number of days during project	Daily PM_{10} Emissions per Acre (lbs)	Daily PM_{10} Emissions (0.1 acres)	Project PM_{10} Emissions per site (lbs)	Project PM_{10} Emissions (55 sites)
0.1 acres per site x 55 sites	13.2	10	2.23	10	0.02	0.001680	0.01680	0.924
Source:	*LOR Sieve Analysis*	*SCAQMD CEQA Table A9-9-E-2 (worst case - SCAB /drought)*	*Jan-Mar met data.*	Estimated potential exposed days.			Daily emissions per site x 10 exposed days	55 poles x project emissions per pole.

Dirt Loading/Handling

$E = [0.00112 \times ([(G/5)^{1.3}]/[(H/2)^{1.4}])] \times [I/J]$

E = PM_{10} Emissions from dirt loading/handling
G = Mean wind speed in miles per hour
H = Moisture content of surface material
I = Pounds of dir loaded or handled per day
J = 2,000; convert lbs of dirt to tons of dirt

	m/s	mph
G	1.652	3.70

Location	G (Mean wind speed mph)	H (Moisture content)	I (Lbs of dirt handled/day)	Number of days during project	Daily PM_{10} Emissions (lbs)	Project PM_{10} Emissions (lbs)
Loader Operations, load 130 - 150 cf per site	3.70	10	2,000	45	0.05	2.26
Source:	*Jan-Mar Average.*	*SCAQMD CEQA Table A9-9-G-1 (worst case - SCAB/drought)*				

Transmission Line Fugitive Construction Emissions

Travel on Paved Roads

E = V x F

E = PM_{10} Emissions from travel on paved roads
V = Vehicle miles traveled = W x X
W = Travel distance in miles
X = Number of Vehicles
F = Emission factor for travel on paved roads (Table A9 -9-B-1 for passenger vehicles))

Vehicle Type	Total number of vehicles	Travel Distance (miles)	Vehicle miles traveled/day	Number of Project days	G (Paved Road silt content)	F (Emission Factor)	Daily PM_{10} Emissions (lbs)	Project PM_{10} Emissions (lbs)
Passenger vehicle	3	2	6	55	na	0.0021	0.0128	0.70
Truck concrete, delivery, fuel	3	2	6	55	0.0041	0.11	0.65	35.65
Total							0.66	36.35

	CURE recommendation	SCAQMD CEQA Guide Table A9-9-B-1 Passenger - 5% local st, 5% collector st, 90% freeway
	SCAQMD CEQA Table A-9-C-1, 5% local, 5% collector, 90% freeway	

Source: *SCAQMD CEQA Table A9-9-C-1*

SCEC

APPENDIX B

AIR QUALITY IMPACT ANALYSIS

Construction Air Dispersion Modeling Results Summary
Riverside Energy Resource Center
8/10/04

Description	Time Period	Maximum Concentrations ($\mu g/m^3$)		Receptor UTM Coordinates
Run#: RIVERSIDECEC04b				
- Construction Emissions	**24-Hour**	10.22693	UTM E	458180
- Combustion and Fugitive PM Sources			UTM N	3757640
- Area and Volume Sources				
- 24-Hour				
- Actual Emission Rates				
Run#: RIVERSIDECEC04b2				
- Construction Emissions	**Annual**	0.12889	UTM E	458180
- Combustion and Fugitive PM Sources			UTM N	3757640
- Area and Volume Sources				
- Annual				
- Actual Emission Rates				
Run#: RIVERSIDECEC05b				
- Construction Emissions	**1-Hour**	432.44705	UTM E	458180
- Combustion NOx Sources			UTM N	3757640
- Volume Sources				
- 1-Hour				
- Actual Emission Rates				
Run#: RIVERSIDECEC05b2				
- Construction Emissions	**Annual**	0.28812	UTM E	458180
- Combustion NOx Sources			UTM N	3757640
- Volume Sources				
- Annual				
- Actual Emission Rates				
Run#: RIVERSIDECEC06b				
- Construction Emissions	**1-Hour**	358.18207	UTM E	458180
- Combustion CO Sources			UTM N	3757640
- Volume Sources				
- 1-Hour and 8-Hour	**8-Hour**	78.1348	UTM E	458180
- Actual Emission Rates			UTM N	3757640
Run#: RIVERSIDECEC07b				
- Construction Emissions	**1-Hour**	0.38873	UTM E	458180
- Combustion SOx Sources			UTM N	3757640
- Volume Sources				
- 1-Hour, 3-Hour, and 24-Hour	**3-Hour**	0.13283	UTM E	458180
- Actual Emission Rates			UTM N	3757640
	24-Hour	0.02830	UTM E	458180
			UTM N	3757640

Notes:

1. Maximum concentrations ($\mu g/m^3$) represent 9 hours per day, 356 days per year..
2. Maximum concentrations ($\mu g/m^3$) are from the nearest residential receptor.
3. Modeling runs were conducted with actual emission rates.

Air Quality Impact Analysis - Significant Change In Air Quality
Construction Emissions
Riverside ERC

(revised July 25)

(Impacts reflect highest impact of four residential and two sensitive receptor sites)

1-hr - 24 hr impacts reflect November high emission rates, 12 operating hours per day and 365 days per year.
Annual impacts reflect project average hourly hourly emissions, 12 hours per day,365 days per year with scaling to 1408 project hours.

Air Quality Impacy Analysis:

Pollutant	Averaging Time	Emission Rate (g/sec)	Maximum Impact (ug/m^3)	SCAQMD Significant Change In Air Quality Threshold (ug/m^3)
NO_2	1 - Hour	1.71	**432.4471**	**20.0**
NO_2	Annual*	1.71	**0.28812**	**1.0**
CO	1 - Hour	0.72	**358.18207**	**1100.0**
CO	8 - Hour	0.72	**78.1348**	**500.0**
PM	24 - Hour	0.81	**10.22693**	**10.4 for construction Env. Justice**
PM_{10}	Annual*	0.81	**0.12889**	**1.0**
$PM_{2.5}$	24 - Hour	0.00	**N/A**	**N/A**
$PM_{2.5}$	Annual	0.00	**N/A**	**N/A**
Sulfate	24-Hour	0.00	**0.38873**	**N/A**
SO2	1 - Hour	0.00	**0.13283**	**N/A**
SO2	24-Hour	0.00	**0.02830**	**N/A**

Note:
- X/Q Max values ($ug/m^3/g/sec$) are taken from the ISC 3 model.

Air Quality Impact Analysis - Summary of Ambient Air Quality Analysis
Construction Emissions
Riverside ERC

Ambient Air Quality Analysis:

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Ambient Standard
NO_x	1 - Hour (ppm)	0.043	0.15	2001, Rubidoux	0.193	0.25
NO_x	Annual (ppm)	0.00009	0.03	1999, Rubidoux	0.026	0.0534
CO	1 - Hour (ppm)	0.313	11.0	1997, Riverside Magnolia	11.3	20.0
CO	8 - Hour (ppm)	0.068	5.8	1997, Rubidoux	5.9	9.0
PM	24 - Hour ($\mu g/m^3$)	10.23	164.0	2003, Rubidoux	174.2	50.0
PM_{10}	Annual ($\mu g/m^3$)	0.13	72.30	1999, Rubidoux	72.43	20.0
$PM_{2.5}$	24 - Hour ($\mu g/m^3$)	N/A	119.6	2000, Rubidoux	N/A	65.0
$PM_{2.5}$	Annual ($\mu g/m^3$)	N/A	31.10	2001, Rubidoux	N/A	12.0
Sulfate	24 - Hour ($\mu g/m^3$)	0.39	11.700	2002, Rubidoux	12.09	25.00
SO_2	1-hour (ppm)	0.00005	0.110	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.00001	0.041	2000, Rubidoux	0.041	0.040

Air Quality Impact Analysis - Ambient NO_2 Analysis
Construction Emissions
Riverside ERC

1-Hour NO_2 Analysis:

1. Convert NO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Hour $\mu g/m^3$:	432.4	OLM Ratio	0.186
NO2 MW:	46.0	(Valid only for consruction impacts)	
Conversion:	0.0245	(based upon 325 meter distance to MEI)	
So:		(SCAQMD Oct 3, 2003 agenda 34, table 2-4)	
ppm NO2=	0.0428		

2. Add NO2 1-hour background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.043	
Ambient background data (ppm):	0.15	Station 4144 - Rubidoux - Year 2001

So:

Project + Background (ppm):	0.19
Most Stringent NO2 1-Hour Standard (ppm):	0.25

Annual NO_2 Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Annual $\mu g/m^3$:	0.29	OLM Ratio	0.59
NO2 MW:	46.0	(per SCAQMD)	
Conversion:	0.0245		
So:			
ppm NO2 =	0.00009		

2. Add NO2 annual background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.00009	
Ambient background data (ppm):	0.0262	Station 4144 - Rubidoux - Year 1999

So:

Project + Background (ppm):	0.0263
Most Stringent NO2 Annual Standard (ppm):	0.0534

Air Quality Impact Analysis - Ambient CO Analysis
Construction Emissions
Riverside ERC

1-Hour CO Analysis:

1. Convert CO 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 1-Hour $\mu g/m^3$:	358.2
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO =	0.3134

2. Add CO 1-hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.313	
Ambient background data (ppm):	11.0	Station 4146 - Riverside- Magnolia - 1997

So:

Project + Background (ppm):	11.31
Most Stringent CO 1-Hour Standard (ppm):	20.0

8-Hour CO Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 8-Hour $\mu g/m^3$:	78.1
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO=	0.068

2. Add CO 8-Hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.068	
Ambient background data (ppm):	5.8	Station 4144 - Rubidoux - 1997

So:

Project + Background (ppm):	5.87
Most Stringent CO 8-Hour Standard (ppm):	9.0

Air Quality Impact Analysis - Ambient PM_{10} Analysis
Construction Emissions
Riverside ERC

24-Hour PM_{10} Analysis:

1. Add PM_{10} 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 10.227

Ambient background data ($\mu g/m^3$): 164.0 Station 4144 - Rubidoux - 2003

So:

Project + Background ($\mu g/m^3$): 174.2

Most Stringent PM_{10} 24-Hour Standard ($\mu g/m^3$): 50.0

Annual PM_{10} Analysis:

1. Add PM_{10} Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.129

Ambient background data ($\mu g/m^3$): 72.3 Station 4144 - Rubidoux - 1999

So:

Project + Background ($\mu g/m^3$): 72.43

Most Stringent PM_{10} Annual Standard ($\mu g/m^3$): 30.0

Air Quality Impact Analysis - Ambient $PM_{2.5}$ Analysis
Construction Emissions
Riverside ERC

24-Hour $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): N/A

Ambient background data ($\mu g/m^3$): 119.6 Station 4144 - Rubidoux - Year 2000

So:

Project + Background ($\mu g/m^3$): #VALUE!

Most Stringent $PM_{2.5}$ 24-Hour Standard ($\mu g/m^3$): 50.0

Annual $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): N/A

Ambient background data ($\mu g/m^3$): 31.1 Station 4144 - Rubidoux - Year 2001

So:

Project + Background ($\mu g/m^3$): #VALUE!

Most Stringent $PM_{2.5}$ Annual Standard ($\mu g/m^3$): 30.0

Air Quality Impact Analysis - Ambient SO_2 / Sulfate
Construction Emissions
Riverside ERC

24-Hour Particulate Sulfate Analysis:

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.39
Ambient background data ($\mu g/m^3$): 11.7 Station 4144 - Rubidoux - Year 2002

So:

Project + Background ($\mu g/m^3$): 12.09
Most Stringent SO_2 24-Hour Standard ($\mu g/m^3$): 25.0

1-Hour SO_2 Analysis:

1. Convert SO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 1-Hour $\mu g/m^3$:	0.133
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000051

2. Add SOx 1-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm): 0.000051
Ambient background data (ppm): 0.11 Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm): 0.11
Most Stringent SO_2 24-Hour Standard (ppm): 0.25

24-Hour SO_2 Analysis:

1. Convert SO2 24-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 24-Hour $\mu g/m^3$:	0.028
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000011

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm): 0.00001
Ambient background data (ppm): 0.041 Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm): 0.041
Most Stringent SO_2 24-Hour Standard (ppm): 0.040

Sensitive Receptor List
Riverside ERC
8/10/04

Receptor Description	Elevation	Coordinates	
Residence A – Nearest Residential Receptor (Kennel)	760'	UTME 458201.6	UTMN 3757614.4
Residence B – Nearby Residential Receptor	830'	UTME 459280	UTMN 3757620
Residence C – Nearby Residential Receptor	770'	UTME 458120	UTMN 3758880
Residence D – Nearby Residential Receptor	740'	UTME 457090	UTMN 3757570
School A – Nearest School	810'	UTME 458430	UTMN 3759250
School B – Nearest School	760'	UTME 456360	UTMN 3756590

```
                    ISCST3 - (DATED 02035)

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 Run Began on  8/11/2004 at 15:52:51

 ** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC04b.dat
 ** Trinity Consultants


 CO STARTING
 CO TITLEONE  Riverside ERC
 CO TITLETWO  Revised CEC Modeling Run #04b (PM Construction Emissions - 24-Hour)
 CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
 CO AVERTIME  24
 CO POLLUTID  OTHER
 CO TERRHGTS  ELEV
 CO RUNORNOT  RUN
 CO FINISHED

 SO STARTING
 SO ELEVUNIT  METERS
 SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
 ** SRCDESCR  Volume Source #1
 SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
 ** SRCDESCR  Volume Source #2
 SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
 ** SRCDESCR  Volume Source #3
 SO LOCATION  SRC9  AREAPOLY  458199.2  3757835.3  220.98
 ** SRCDESCR  Area Source #1
 SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  226
 ** SRCDESCR  Volume Source #4
 SO LOCATION  SRC5  VOLUME  458267.0  3757973.0  220.98
 ** SRCDESCR  Volume Source #5
 SO LOCATION  SRC6  VOLUME  458282.0  3758080.0  220.98
 ** SRCDESCR  Volume Source #6
 SO LOCATION  SRC7  VOLUME  458305.3  3757903.5  220.98
 ** SRCDESCR  Volume Source #7
 SO LOCATION  SRC8  VOLUME  458241.3  3757903.5  220.98
 ** SRCDESCR  Volume Source #8
 SO SRCPARAM  SRC1  7.333077E-03  6  34.02001  2.8
 SO SRCPARAM  SRC2  2.201183E-02  6  34.02001  2.8
 SO SRCPARAM  SRC3  3.667799E-02  6  23.39  2.8
 SO SRCPARAM  SRC9  4.100000E-08  0.1    5    0
 SO AREAVERT  SRC9    458199.2  3757835.3  458200.4  3758064.2  458265.1  3758167.1
 SO AREAVERT  SRC9    458343.7  3758167.1  458344.8  3757834.2
 SO SRCPARAM  SRC4  7.333077E-03  6  14.5  2.8
 SO SRCPARAM  SRC5  1.198744E-01  2  34.02001  1.9
 SO SRCPARAM  SRC6  1.177198E-01  2  34.02001  1.9
 SO SRCPARAM  SRC7  2.692323E-01  2  25.5  1.9
 SO SRCPARAM  SRC8  7.532154E-02  2  25.5  1.9
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC9 , SRC4 , SRC5 , SRC6 ,
SRC7 , SRC8 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)		X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	10.22693	(81111924)		459280.00	3757620.00	2.53996	(81121024)	B
C	458120.00	3758880.00	2.02492	(81111624)		457090.00	3757570.00	1.44384	(81013024)	D
E	458430.00	3759250.00	1.00911	(81113024)		456360.00	3756590.00	0.45435	(81121724)	F
Fence	458188.09	3757821.00	24.72821	(81122724)		458188.09	3757851.00	33.51794	(81011124)	Fence
	458188.09	3757881.00	43.12804	(81120624)		458188.09	3757911.00	37.13899	(81120224)	
	458188.09	3757941.00	45.26886	(81120224)		458188.09	3757971.00	39.48003	(81120224)	
	458188.09	3758001.00	33.21518	(81120224)		458188.09	3758031.00	28.23609	(81120224)	
	458188.09	3758061.00	22.99827	(81120224)		458188.09	3758066.00	22.27011	(81120224)	
	458203.53	3758091.75	21.28165	(81121424)		458218.97	3758117.50	17.98028	(81121424)	
	458234.38	3758143.25	24.91801	(81121424)		458249.84	3758169.00	19.40224	(81121424)	
	458253.91	3758175.75	17.38788	(81121424)		458283.91	3758175.75	18.18240	(81102124)	
	458313.91	3758175.75	21.36790	(81012824)		458343.91	3758175.75	21.80628	(81012824)	
	458360.00	3758175.75	20.78475	(81012824)		458360.00	3758145.75	26.26671	(81012824)	
	458360.00	3758115.75	28.61815	(81012824)		458360.00	3758085.75	30.35482	(81012724)	
	458360.00	3758055.75	28.87558	(81102724)		458360.00	3758025.75	36.87095	(81012824)	
	458360.00	3757995.75	48.34255	(81012824)		458360.00	3757965.75	64.11437	(81102724)	
	458360.00	3757935.75	86.32303	(81012724)		458360.00	3757905.75	29.31321	(81012724)	
	458360.00	3757875.75	97.64469	(81041024)		458360.00	3757845.75	76.93636	(81122924)	
	458360.00	3757821.00	58.57570	(81121524)		458330.00	3757821.00	65.24938	(81122824)	
	458300.00	3757821.00	77.03066	(81122824)		458270.00	3757821.00	58.90868	(81122824)	
	458240.00	3757821.00	45.90966	(81122724)		458210.00	3757821.00	33.61955	(81122724)	

1

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Run Began on  8/11/2004 at 15:51:43

** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC04b2.dat
** Trinity Consultants


CO STARTING
CO TITLEONE  Riverside ERC
CO TITLETWO  Revised CEC Modeling Run #04b2 (PM Construction Emissions - Annual)
CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
CO AVERTIME  ANNUAL
CO POLLUTID  OTHER
CO TERRHGTS  ELEV
CO RUNORNOT  RUN
CO FINISHED

SO STARTING
SO ELEVUNIT  METERS
SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
** SRCDESCR  Volume Source #1
SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
** SRCDESCR  Volume Source #2
SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
** SRCDESCR  Volume Source #3
SO LOCATION  SRC9  AREAPOLY  458199.2  3757835.3  220.98
** SRCDESCR  Area Source #1
SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  226
** SRCDESCR  Volume Source #4
SO LOCATION  SRC5  VOLUME  458267.0  3757973.0  220.98
** SRCDESCR  Volume Source #5
SO LOCATION  SRC6  VOLUME  458282.0  3758080.0  220.98
** SRCDESCR  Volume Source #6
SO LOCATION  SRC7  VOLUME  458305.3  3757903.5  220.98
** SRCDESCR  Volume Source #7
SO LOCATION  SRC8  VOLUME  458241.3  3757903.5  220.98
** SRCDESCR  Volume Source #8
SO SRCPARAM  SRC1  7.509474E-03  6  34.02001  2.8
SO SRCPARAM  SRC2  1.411176E-03  6  34.02001  2.8
SO SRCPARAM  SRC3  1.411176E-03  6  23.39  2.8
SO SRCPARAM  SRC9  7.000000E-09  0.1    5    0
SO AREAVERT  SRC9    458199.2  3757835.3  458200.4  3758064.2  458265.1  3758167.1
SO AREAVERT  SRC9    458343.7  3758167.1  458344.8  3757834.2
SO SRCPARAM  SRC4  1.411176E-03  6  14.5  2.8
SO SRCPARAM  SRC5  9.588439E-03  2  34.02001  1.9
SO SRCPARAM  SRC6  1.236039E-02  2  34.02001  1.9
SO SRCPARAM  SRC7  4.427566E-02  2  25.5  1.9
SO SRCPARAM  SRC8  4.435126E-03  2  25.5  1.9
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**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE ANNUAL (1 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC9 , SRC4 , SRC5 , SRC6 ,
SRC7 , SRC8 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC		X-COORD (M)	Y-COORD (M)	CONC	
A	458180.00	3757640.00	0.12889		459280.00	3757620.00	0.08217	B
C	458120.00	3758880.00	0.01625		457090.00	3757570.00	0.00846	D
E	458430.00	3759250.00	0.01046		456360.00	3756590.00	0.00193	F
Fence	458188.09	3757821.00	0.39976		458188.09	3757851.00	0.54977	Fence
	458188.09	3757881.00	0.68137		458188.09	3757911.00	0.74760	
	458188.09	3757941.00	0.81841		458188.09	3757971.00	0.74077	
	458188.09	3758001.00	0.65298		458188.09	3758031.00	0.56469	
	458188.09	3758061.00	0.48815		458188.09	3758066.00	0.47771	
	458203.53	3758091.75	0.44575		458218.97	3758117.50	0.27158	
	458234.38	3758143.25	0.34445		458249.84	3758169.00	0.36444	
	458253.91	3758175.75	0.35518		458283.91	3758175.75	0.40557	
	458313.91	3758175.75	0.41259		458343.91	3758175.75	0.39758	
	458360.00	3758175.75	0.37243		458360.00	3758145.75	0.52247	
	458360.00	3758115.75	0.65140		458360.00	3758085.75	0.87569	
	458360.00	3758055.75	1.30310		458360.00	3758025.75	1.45749	
	458360.00	3757995.75	1.77678		458360.00	3757965.75	2.35994	
	458360.00	3757935.75	2.75095		458360.00	3757905.75	1.18695	
	458360.00	3757875.75	4.96721		458360.00	3757845.75	3.34695	
	458360.00	3757821.00	1.93511		458330.00	3757821.00	1.72202	
	458300.00	3757821.00	1.34886		458270.00	3757821.00	1.07989	
	458240.00	3757821.00	0.76022		458210.00	3757821.00	0.52987	

1

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Run Began on  8/11/2004 at 15:59:37

** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC05b.dat
** Trinity Consultants


CO STARTING
CO TITLEONE  Riverside ERC
CO TITLETWO  CEC Modeling Run #05b (NOx Construction Emissions - 1-Hour)
CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
CO AVERTIME  1
CO POLLUTID  OTHER
CO TERRHGTS  ELEV
CO RUNORNOT  RUN
CO FINISHED

SO STARTING
SO ELEVUNIT  METERS
SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
** SRCDESCR  Volume Source #1
SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
** SRCDESCR  Volume Source #2
SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
** SRCDESCR  Volume Source #3
SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  226
** SRCDESCR  Volume Source #4
SO SRCPARAM  SRC1  1.833269E-01  6  34.02001  2.8
SO SRCPARAM  SRC2  5.498548E-01  6  34.02001  2.8
SO SRCPARAM  SRC3  9.163826E-01  6  23.39  2.8
SO SRCPARAM  SRC4  1.833269E-01  6  14.5  2.8
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)		X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	432.44705	(81111919)		459280.00	3757620.00	80.74805	(81030219)	B
C	458120.00	3758880.00	104.06576	(81111608)		457090.00	3757570.00	66.52567	(81120219)	D
E	458430.00	3759250.00	55.75760	(81013108)		456360.00	3756590.00	30.64457	(81121719)	F
Fence	458188.09	3757821.00	939.11060	(81020319)		458188.09	3757851.00	1096.19556	(81120408)	Fence
	458188.09	3757881.00	1176.91687	(81111108)		458188.09	3757911.00	1135.49841	(81102308)	
	458188.09	3757941.00	949.03333	(81112208)		458188.09	3757971.00	815.89368	(81010808)	
	458188.09	3758001.00	709.15204	(81110508)		458188.09	3758031.00	612.29443	(81011008)	
	458188.09	3758061.00	528.31982	(81030808)		458188.09	3758066.00	517.01825	(81030808)	
	458203.53	3758091.75	639.88263	(81102008)		458218.97	3758117.50	682.22302	(81121408)	
	458234.38	3758143.25	661.72101	(81111608)		458249.84	3758169.00	647.75995	(81111608)	
	458253.91	3758175.75	635.57831	(81120918)		458283.91	3758175.75	667.85168	(81102108)	
	458313.91	3758175.75	653.43488	(81113008)		458343.91	3758175.75	615.96283	(81122308)	
	458360.00	3758175.75	565.97778	(81030308)		458360.00	3758145.75	648.83087	(81030308)	
	458360.00	3758115.75	719.31616	(81011819)		458360.00	3758085.75	573.50415	(81091119)	
	458360.00	3758055.75	580.30823	(81120308)		458360.00	3758025.75	701.72131	(81011818)	
	458360.00	3757995.75	847.36334	(81011619)		458360.00	3757965.75	1034.88464	(81091619)	
	458360.00	3757935.75	1211.84277	(81012618)		458360.00	3757905.75	1438.01917	(81012719)	
	458360.00	3757875.75	1404.90588	(81110518)		458360.00	3757845.75	1196.67651	(81111319)	
	458360.00	3757821.00	1029.25159	(81112318)		458330.00	3757821.00	1274.23901	(81013019)	
	458300.00	3757821.00	1503.39966	(81121418)		458270.00	3757821.00	1447.80017	(81020608)	
	458240.00	3757821.00	1203.08252	(81112108)		458210.00	3757821.00	1043.36743	(81011708)	

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                    ISCST3 - (DATED 02035)

             ISCST3X  PC (32 BIT) VERSION  4.0.0
            (C) COPYRIGHT 1991-2002, Trinity Consultants

 Run Began on  8/11/2004 at 19:24:50

 ** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC05b2.dat
 ** Trinity Consultants


 CO STARTING
 CO TITLEONE  Riverside ERC
 CO TITLETWO  CEC Modeling Run #05b2 (NOx Construction Emissions - Annual)
 CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
 CO AVERTIME  ANNUAL
 CO POLLUTID  OTHER
 CO TERRHGTS  ELEV
 CO RUNORNOT  RUN
 CO FINISHED

 SO STARTING
 SO ELEVUNIT  METERS
 SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
 ** SRCDESCR  Volume Source #1
 SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
 ** SRCDESCR  Volume Source #2
 SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
 ** SRCDESCR  Volume Source #3
 SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  226
 ** SRCDESCR  Volume Source #4
 SO SRCPARAM  SRC1  1.275225E-01  6  34.02001  2.8
 SO SRCPARAM  SRC2  2.187323E-02  6  34.02001  2.8
 SO SRCPARAM  SRC3  1.821930E-02  6  23.39  2.8
 SO SRCPARAM  SRC4  1.456536E-02  6  14.5  2.8
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE ANNUAL (1 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC	
A	458180.00	3757640.00	0.28812	459280.00	3757620.00	0.17543	B
C	458120.00	3758880.00	0.03555	457090.00	3757570.00	0.01831	D
E	458430.00	3759250.00	0.02274	456360.00	3756590.00	0.00407	F
Fence	458188.09	3757821.00	0.96075	458188.09	3757851.00	1.30973	Fence
	458188.09	3757881.00	1.72052	458188.09	3757911.00	2.05083	
	458188.09	3757941.00	2.11647	458188.09	3757971.00	1.98236	
	458188.09	3758001.00	1.72250	458188.09	3758031.00	1.38979	
	458188.09	3758061.00	1.09777	458188.09	3758066.00	1.05664	
	458203.53	3758091.75	0.97011	458218.97	3758117.50	0.86489	
	458234.38	3758143.25	0.76843	458249.84	3758169.00	0.65557	
	458253.91	3758175.75	0.62688	458283.91	3758175.75	0.68823	
	458313.91	3758175.75	0.70617	458343.91	3758175.75	0.67762	
	458360.00	3758175.75	0.64717	458360.00	3758145.75	0.85916	
	458360.00	3758115.75	1.12474	458360.00	3758085.75	1.29199	
	458360.00	3758055.75	1.35143	458360.00	3758025.75	2.04047	
	458360.00	3757995.75	3.88628	458360.00	3757965.75	4.65852	
	458360.00	3757935.75	7.53023	458360.00	3757905.75	8.45812	
	458360.00	3757875.75	7.08063	458360.00	3757845.75	4.84852	
	458360.00	3757821.00	3.20313	458330.00	3757821.00	3.21843	
	458300.00	3757821.00	2.66325	458270.00	3757821.00	2.36780	
	458240.00	3757821.00	1.82400	458210.00	3757821.00	1.31040	

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ISCST3X  PC (32 BIT) VERSION  4.0.0
(C) COPYRIGHT 1991-2002, Trinity Consultants

Run Began on  8/11/2004 at 16:04:35

** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC06b.dat
** Trinity Consultants


CO STARTING
CO TITLEONE  Riverside ERC
CO TITLETWO  CEC Modeling Run #06b (CO Construction Emissions)
CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
CO AVERTIME  1  8
CO POLLUTID  OTHER
CO TERRHGTS  ELEV
CO RUNORNOT  RUN
CO FINISHED

SO STARTING
SO ELEVUNIT  METERS
SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
** SRCDESCR  Volume Source #1
SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
** SRCDESCR  Volume Source #2
SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
** SRCDESCR  Volume Source #3
SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  226
** SRCDESCR  Volume Source #4
SO SRCPARAM  SRC1  1.518275E-01  6  34.02001  2.8
SO SRCPARAM  SRC2  4.554824E-01  6  34.02001  2.8
SO SRCPARAM  SRC3  7.590113E-01  6  23.39  2.8
SO SRCPARAM  SRC4  1.518275E-01  6  14.5  2.8
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)		X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	358.18207	(81111919)		459280.00	3757620.00	66.88111	(81030219)	B
C	458120.00	3758880.00	86.19617	(81111608)		457090.00	3757570.00	55.10118	(81120219)	D
E	458430.00	3759250.00	46.18327	(81013108)		456360.00	3756590.00	25.38209	(81121719)	F
Fence	458188.09	3757821.00	777.81561	(81020319)		458188.09	3757851.00	907.91345	(81120408)	Fence
	458188.09	3757881.00	974.77435	(81111108)		458188.09	3757911.00	940.47021	(81102308)	
	458188.09	3757941.00	786.03894	(81112208)		458188.09	3757971.00	675.76605	(81010808)	
	458188.09	3758001.00	587.35663	(81110508)		458188.09	3758031.00	507.13367	(81011008)	
	458188.09	3758061.00	437.58087	(81030808)		458188.09	3758066.00	428.22040	(81030808)	
	458203.53	3758091.75	530.00482	(81102008)		458218.97	3758117.50	565.08307	(81121408)	
	458234.38	3758143.25	548.10132	(81111608)		458249.84	3758169.00	536.54333	(81111608)	
	458253.91	3758175.75	526.45239	(81120918)		458283.91	3758175.75	553.18701	(81102108)	
	458313.91	3758175.75	541.24298	(81113008)		458343.91	3758175.75	510.20245	(81122308)	
	458360.00	3758175.75	468.79926	(81030308)		458360.00	3758145.75	537.42505	(81030308)	
	458360.00	3758115.75	595.80573	(81011819)		458360.00	3758085.75	475.05060	(81091119)	
	458360.00	3758055.75	480.63779	(81120308)		458360.00	3758025.75	581.20001	(81011818)	
	458360.00	3757995.75	701.82874	(81011619)		458360.00	3757965.75	857.14478	(81091619)	
	458360.00	3757935.75	1003.70752	(81012618)		458360.00	3757905.75	1191.04456	(81012719)	
	458360.00	3757875.75	1163.62097	(81110518)		458360.00	3757845.75	991.15771	(81111319)	
	458360.00	3757821.00	852.48944	(81112318)		458330.00	3757821.00	1055.41138	(81013019)	
	458300.00	3757821.00	1245.22583	(81121418)		458270.00	3757821.00	1199.17334	(81020608)	
	458240.00	3757821.00	996.47217	(81112108)		458210.00	3757821.00	864.17340	(81011708)	

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**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 8-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	78.13480	(81111924)	459280.00	3757620.00	13.18872	(81121024)	B
C	458120.00	3758880.00	10.77452	(81111608)	457090.00	3757570.00	7.94781	(81120224)	D
E	458430.00	3759250.00	5.77291	(81013108)	456360.00	3756590.00	3.17276	(81121724)	F
Fence	458188.09	3757821.00	139.17241	(81121724)	458188.09	3757851.00	197.43311	(81112816)	Fence
	458188.09	3757881.00	276.82236	(81122716)	458188.09	3757911.00	278.60336	(81122716)	
	458188.09	3757941.00	211.33214	(81122716)	458188.09	3757971.00	154.05722	(81122716)	
	458188.09	3758001.00	118.31094	(81122716)	458188.09	3758031.00	107.00130	(81122716)	
	458188.09	3758061.00	101.44014	(81122716)	458188.09	3758066.00	99.49303	(81122716)	
	458203.53	3758091.75	88.90326	(81122716)	458218.97	3758117.50	108.37075	(81110816)	
	458234.38	3758143.25	93.31489	(81110816)	458249.84	3758169.00	70.55484	(81110816)	
	458253.91	3758175.75	65.87006	(81120924)	458283.91	3758175.75	75.26200	(81012816)	
	458313.91	3758175.75	92.07170	(81012816)	458343.91	3758175.75	95.45124	(81011824)	
	458360.00	3758175.75	101.16151	(81011824)	458360.00	3758145.75	122.45215	(81011824)	
	458360.00	3758115.75	141.87938	(81011824)	458360.00	3758085.75	129.36198	(81102716)	
	458360.00	3758055.75	116.17505	(81011824)	458360.00	3758025.75	136.39325	(81011824)	
	458360.00	3757995.75	177.78865	(81102716)	458360.00	3757965.75	247.27150	(81102716)	
	458360.00	3757935.75	314.98279	(81102716)	458360.00	3757905.75	353.14951	(81102716)	
	458360.00	3757875.75	353.11252	(81041016)	458360.00	3757845.75	326.51852	(81041016)	
	458360.00	3757821.00	295.94135	(81121524)	458330.00	3757821.00	375.28235	(81121524)	
	458300.00	3757821.00	381.35495	(81112224)	458270.00	3757821.00	325.55939	(81121624)	
	458240.00	3757821.00	226.17574	(81121724)	458210.00	3757821.00	185.64015	(81121724)	

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                    ISCST3 - (DATED 02035)

             ISCST3X  PC (32 BIT) VERSION  4.0.0
            (C) COPYRIGHT 1991-2002, Trinity Consultants

 Run Began on  8/11/2004 at 16:07:18

 ** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC07b.dat
 ** Trinity Consultants


 CO STARTING
 CO TITLEONE  Riverside ERC
 CO TITLETWO  CEC Modeling Run #07b (SOx Construction Emissions)
 CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
 CO AVERTIME  1  3  24
 CO POLLUTID  OTHER
 CO TERRHGTS  ELEV
 CO RUNORNOT  RUN
 CO FINISHED

 SO STARTING
 SO ELEVUNIT  METERS
 SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
 ** SRCDESCR  Volume Source #1
 SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
 ** SRCDESCR  Volume Source #2
 SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
 ** SRCDESCR  Volume Source #3
 SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  226
 ** SRCDESCR  Volume Source #4
 SO SRCPARAM  SRC1  1.259979E-04  6  34.02001  2.8
 SO SRCPARAM  SRC2  5.039917E-04  6  34.02001  2.8
 SO SRCPARAM  SRC3  8.819852E-04  6  23.39  2.8
 SO SRCPARAM  SRC4  1.259979E-04  6  14.5  2.8
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	0.38873	(81021808)	459280.00	3757620.00	0.07223	(81030219)	B
C	458120.00	3758880.00	0.09338	(81111608)	457090.00	3757570.00	0.05911	(81120219)	D
E	458430.00	3759250.00	0.05030	(81013108)	456360.00	3756590.00	0.02735	(81121719)	F
Fence	458188.09	3757821.00	0.82846	(81020319)	458188.09	3757851.00	0.97503	(81120908)	Fence
	458188.09	3757881.00	1.04268	(81111108)	458188.09	3757911.00	1.01366	(81011808)	
	458188.09	3757941.00	0.86438	(81112208)	458188.09	3757971.00	0.74427	(81010808)	
	458188.09	3758001.00	0.64572	(81110508)	458188.09	3758031.00	0.55628	(81011008)	
	458188.09	3758061.00	0.47803	(81121419)	458188.09	3758066.00	0.46776	(81030808)	
	458203.53	3758091.75	0.58203	(81102008)	458218.97	3758117.50	0.62111	(81121408)	
	458234.38	3758143.25	0.59858	(81111608)	458249.84	3758169.00	0.58984	(81111608)	
	458253.91	3758175.75	0.57791	(81110208)	458283.91	3758175.75	0.60819	(81102108)	
	458313.91	3758175.75	0.58679	(81113008)	458343.91	3758175.75	0.55418	(81122308)	
	458360.00	3758175.75	0.51032	(81122308)	458360.00	3758145.75	0.58108	(81030308)	
	458360.00	3758115.75	0.64802	(81011819)	458360.00	3758085.75	0.50686	(81091119)	
	458360.00	3758055.75	0.52205	(81011819)	458360.00	3758025.75	0.63691	(81111808)	
	458360.00	3757995.75	0.77071	(81120917)	458360.00	3757965.75	0.94129	(81091119)	
	458360.00	3757935.75	1.09210	(81012618)	458360.00	3757905.75	1.31647	(81021619)	
	458360.00	3757875.75	1.29443	(81020108)	458360.00	3757845.75	1.11272	(81020419)	
	458360.00	3757821.00	0.95933	(81112318)	458330.00	3757821.00	1.19231	(81013019)	
	458300.00	3757821.00	1.40803	(81121418)	458270.00	3757821.00	1.35478	(81020608)	
	458240.00	3757821.00	1.11722	(81102908)	458210.00	3757821.00	0.94252	(81011708)	

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**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 3-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)		X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	0.13283	(81010109)		459280.00	3757620.00	0.03344	(81111418)	B
C	458120.00	3758880.00	0.03917	(81111609)		457090.00	3757570.00	0.02009	(81120609)	D
E	458430.00	3759250.00	0.01678	(81102809)		456360.00	3756590.00	0.00912	(81121721)	F
fence	458188.09	3757821.00	0.40247	(81011709)		458188.09	3757851.00	0.40306	(81120609)	Fence
	458188.09	3757881.00	0.51131	(81022309)		458188.09	3757911.00	0.52857	(81011809)	
	458188.09	3757941.00	0.42551	(81112209)		458188.09	3757971.00	0.37118	(81110309)	
	458188.09	3758001.00	0.31268	(81110309)		458188.09	3758031.00	0.25903	(81030809)	
	458188.09	3758061.00	0.23275	(81030809)		458188.09	3758066.00	0.22683	(81030809)	
	458203.53	3758091.75	0.28847	(81030809)		458218.97	3758117.50	0.28286	(81101909)	
	458234.38	3758143.25	0.30194	(81111609)		458249.84	3758169.00	0.28514	(81111609)	
	458253.91	3758175.75	0.27460	(81111609)		458283.91	3758175.75	0.29608	(81102109)	
	458313.91	3758175.75	0.27745	(81102809)		458343.91	3758175.75	0.26907	(81102809)	
	458360.00	3758175.75	0.23688	(81102809)		458360.00	3758145.75	0.25783	(81102809)	
	458360.00	3758115.75	0.30774	(81120309)		458360.00	3758085.75	0.23791	(81012818)	
	458360.00	3758055.75	0.25162	(81120309)		458360.00	3758025.75	0.31608	(81120309)	
	458360.00	3757995.75	0.36987	(81111809)		458360.00	3757965.75	0.40272	(81012818)	
	458360.00	3757935.75	0.54883	(81012618)		458360.00	3757905.75	0.81311	(81012718)	
	458360.00	3757875.75	0.83494	(81111418)		458360.00	3757845.75	0.69518	(81122918)	
	458360.00	3757821.00	0.71190	(81121518)		458330.00	3757821.00	0.83830	(81121518)	
	458300.00	3757821.00	0.76236	(81110218)		458270.00	3757821.00	0.73949	(81110218)	
	458240.00	3757821.00	0.51737	(81010109)		458210.00	3757821.00	0.45780	(81011709)	

1

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE 1ST HIGHEST 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	X-COORD (M)	Y-COORD (M)	CONC	(YYMMDDHH)	
A	458180.00	3757640.00	0.02830	(81111924)	459280.00	3757620.00	0.00605	(81121024)	B
C	458120.00	3758880.00	0.00497	(81111624)	457090.00	3757570.00	0.00371	(81013024)	D
E	458430.00	3759250.00	0.00248	(81113024)	456360.00	3756590.00	0.00115	(81121724)	F
fence	458188.09	3757821.00	0.06588	(81122724)	458188.09	3757851.00	0.09776	(81011124)	fence
	458188.09	3757881.00	0.12882	(81112824)	458188.09	3757911.00	0.13001	(81120224)	
	458188.09	3757941.00	0.09623	(81120224)	458188.09	3757971.00	0.07536	(81120224)	
	458188.09	3758001.00	0.06408	(81120224)	458188.09	3758031.00	0.06419	(81120224)	
	458188.09	3758061.00	0.06232	(81120224)	458188.09	3758066.00	0.06057	(81120224)	
	458203.53	3758091.75	0.05238	(81121424)	458218.97	3758117.50	0.05900	(81121424)	
	458234.38	3758143.25	0.05445	(81121424)	458249.84	3758169.00	0.04048	(81121424)	
	458253.91	3758175.75	0.03676	(81111624)	458283.91	3758175.75	0.04100	(81102124)	
	458313.91	3758175.75	0.04196	(81012824)	458343.91	3758175.75	0.04663	(81012824)	
	458360.00	3758175.75	0.04651	(81012824)	458360.00	3758145.75	0.06246	(81012824)	
	458360.00	3758115.75	0.07973	(81012824)	458360.00	3758085.75	0.06880	(81012824)	
	458360.00	3758055.75	0.04778	(81011824)	458360.00	3758025.75	0.06948	(81012824)	
	458360.00	3757995.75	0.10212	(81102724)	458360.00	3757965.75	0.12664	(81102724)	
	458360.00	3757935.75	0.16411	(81012724)	458360.00	3757905.75	0.25712	(81012724)	
	458360.00	3757875.75	0.23552	(81020124)	458360.00	3757845.75	0.18530	(81041024)	
	458360.00	3757821.00	0.15407	(81122924)	458330.00	3757821.00	0.17251	(81121524)	
	458300.00	3757821.00	0.22522	(81122824)	458270.00	3757821.00	0.17901	(81122824)	
	458240.00	3757821.00	0.13427	(81122724)	458210.00	3757821.00	0.09553	(81122724)	

1

SCEC

APPENDIX C

SCREENING HEALTH RISK ASSESSMENT

Construction Emissions Health Risk Analysis Summary
Riverside ERC
8/10/04

Health Risk Analysis Results:

Description	MICR	Chronic HI	Acute HI
Construction Emissions MEI			
1-Hour	-	-	-
Annual	4.97×10^{7}	0.0163	-

Construction Toxic Emission Estimates - Combustion Emissions
Riverside ERC
8/10/04

PM10 Lb/hr - Daily High

	Volume 1	Volume 2	Volume 3	Volume 4
	0.0837	0.0144	0.0120	0.0096
Total (lbs/hr):	0.0837	0.0144	0.0120	0.0096
Total (g/s):	0.0105	0.0018	0.0015	0.0012
	-	-	-	-

: file: C:\HARP\projects\demo\PointEstimateRisk.txt

Cancer Analysis

.ted by HARP Risk Module Version: 21.3.20
.tion date: 8/11/2004 6:55:14 PM

ıt Estimate
source: values edited by user
ısure Duration: 70 year (adult resident)
ysis Method: Derived (OEHHA) Method

ICAL CROSS-REFERENCE TABLE

CAS	ABBREVIATION	POLLUTANT NAME
9901	DieselExhPM	Diesel engine exhaust, particulate matter
9902	DieselExhTOG	Diesel engine exhaust, total organic gas

ICAL GROUND LEVEL CONCENTRATIONS (micrograms/m^3)

CAS	ABBREVIATION	AVERAGE	HOURLY MAX	WATER	PASTURE	FISH
9901	DieselExhPM	1.200E-03	1.200E-03	0.000E+00	0.000E+00	0.000E+00
9902	DieselExhTOG	1.200E-03	1.200E-03	0.000E+00	0.000E+00	0.000E+00

NANT PATHWAYS FOR CANCER

INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
YES	-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-	-

VED DOSE BY PATHWAY (mg/(kg-d))

INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	TOTAL
4.52E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.52E-07
3.12E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.64E-07

VED CANCER RISK

INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG	MEAT	ORAL	TOTAL
4.97E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.97E-07
0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
4.97E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.97E-07

: PARAMETERS

ɔSITION

ɔeposition rate (m/s) 0.05

IKING WATER

Pathway disabled ***

(

Pathway disabled ***

'URE

Pathway disabled ***

: GROWN

Pathway disabled ***

IAL ABSORPTION

: file: C:\HARP\projects\demo\PointEstimateRisk.txt

Chronic Analysis

.ted by HARP Risk Module Version: 21.3.20
.tion date: 8/11/2004 6:57:13 PM

ıt Estimate
source: values edited by user
›sure Duration: resident
.ysis Method: Derived (OEHHA) Method

IICAL CROSS-REFERENCE TABLE

	CAS	ABBREVIATION	POLLUTANT NAME
.	9901	DieselExhPM	Diesel engine exhaust, particulate matter
:	9902	DieselExhTOG	Diesel engine exhaust, total organic gas

IICAL GROUND LEVEL CONCENTRATIONS (micrograms/m^3)

	CAS	ABBREVIATION	AVERAGE	HOURLY MAX	WATER	PASTURE	FISH
.	9901	DieselExhPM	8.135E-02	8.135E-02	0.000E+00	0.000E+00	0.000E+00
:	9902	DieselExhTOG	8.135E-02	8.135E-02	0.000E+00	0.000E+00	0.000E+00

.NANT PATHWAYS FOR CHRONIC

	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
.	YES	-	-	-	-	-	-	-	-	-	-	-
:	YES	-	-	-	-	-	-	-	-	-	-	-

ıLATION CONCENTRATION (ug/m^3) AND DERIVED DOSE BY PATHWAY (mg/(kg-d))

	INHAL	DERM	SOIL	MOTHER	FISH	WATER	VEG	DAIRY	BEEF	CHICK	PIG	EGG
.	8.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
:	8.14E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

.VED CHRONIC HI

	CV	CNS	BONE	DEVEL	ENDO	EYE	GILV	IMMUN	KIDN	REPRO	RESP	SKIN	BLOOD	MAX
.	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-02	0.00E+00	0.00E+00	1.63E-02
:	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.00E-30
	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-02	0.00E+00	0.00E+00	1.63E-02

: PARAMETERS

›SITION

›eposition rate (m/s) 0.05

IKING WATER

Pathway disabled ***

I

Pathway disabled ***

'URE

Pathway disabled ***

: GROWN

Pathway disabled ***

IAL ABSORPTION

```
              ISCST3X  PC (32 BIT) VERSION  4.0.0
             (C) COPYRIGHT 1991-2002, Trinity Consultants

 Run Began on  8/11/2004 at 18:52:02

 ** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RERCCECHRA05b.dat
 ** Trinity Consultants


 CO STARTING
 CO TITLEONE  Riverside ERC
 CO TITLETWO  CEC HRA Run #05b (Construction Emissions HRA)
 CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
 CO AVERTIME  ANNUAL
 CO POLLUTID  OTHER
 CO TERRHGTS  ELEV
 CO RUNORNOT  RUN
 CO FINISHED

 SO STARTING
 SO ELEVUNIT  METERS
 SO LOCATION  SRC1  VOLUME  458278.2  3757941.3  220.98
 ** SRCDESCR  Volume Source #1
 SO LOCATION  SRC2  VOLUME  458290.0  3758050.0  220.98
 ** SRCDESCR  Volume Source #2
 SO LOCATION  SRC3  VOLUME  458290.0  3757890.0  220.98
 ** SRCDESCR  Volume Source #3
 SO LOCATION  SRC4  VOLUME  458225.1  3757880.0  220.98
 ** SRCDESCR  Volume Source #4
 SO SRCPARAM  SRC1  1.054602E-02  6  34.02001  2.8
 SO SRCPARAM  SRC2  1.808070E-03  6  34.02001  2.8
 SO SRCPARAM  SRC3  1.506935E-03  6  23.39  2.8
 SO SRCPARAM  SRC4  1.205800E-03  6  14.5  2.8
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE ANNUAL (1 YRS) AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 ,

*** DISCRETE CARTESIAN RECEPTOR POINTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

X-COORD (M)	Y-COORD (M)	CONC	X-COORD (M)	Y-COORD (M)	CONC
458180.00	3757640.00	0.00852	459280.00	3757620.00	0.00314
458120.00	3758880.00	0.00169	457090.00	3757570.00	0.00068
458430.00	3759250.00	0.00099	456360.00	3756590.00	0.00018
458188.09	3757821.00	0.03439	458188.09	3757851.00	0.05455
458188.09	3757881.00	0.08478	458188.09	3757911.00	0.09761
458188.09	3757941.00	0.09913	458188.09	3757971.00	0.09529
458188.09	3758001.00	0.08317	458188.09	3758031.00	0.06713
458188.09	3758061.00	0.05306	458188.09	3758066.00	0.05105
458203.53	3758091.75	0.04647	458218.97	3758117.50	0.04121
458234.38	3758143.25	0.03580	458249.84	3758169.00	0.03003
458253.91	3758175.75	0.02860	458283.91	3758175.75	0.03061
458313.91	3758175.75	0.03064	458343.91	3758175.75	0.02879
458360.00	3758175.75	0.02714	458360.00	3758145.75	0.03512
458360.00	3758115.75	0.04451	458360.00	3758085.75	0.04969
458360.00	3758055.75	0.05279	458360.00	3758025.75	0.07449
458360.00	3757995.75	0.11859	458360.00	3757965.75	0.12768
458360.00	3757935.75	0.18356	458360.00	3757905.75	0.20116
458360.00	3757875.75	0.16757	458360.00	3757845.75	0.11577
458360.00	3757821.00	0.07828	458330.00	3757821.00	0.08135 = occupied high south fence
458300.00	3757821.00	0.07055	458270.00	3757821.00	0.06561
458240.00	3757821.00	0.05436	458210.00	3757821.00	0.04289

0.08135 µg/m³ / 70 yr

= 0.00116 µg/m³ for MICR analysis

RERC Silt Sample Results
(% soil passing #200 sieve)

Specimen	Date	Depth (ft)	Silt %		
B02	31-Dec	0 - 3	12.6		
B10	31-Dec	0 - 3	13.4		
B11	31-Dec	0 - 3	15.1		
B12	31-Dec	0 - 3	11.6	**Average**	
				13.2	
TP1	9-Aug	1 - 3	3.4		
TP2	9-Aug	1 - 3	15.5		
TP3	9-Aug	1 - 3	8.8		
TP4	9-Aug	1 - 3	7.9	**Average**	**Avg to 3 ft**
				8.9	11.0
TP1	9-Aug	3 - 6	3.8		
TP2	9-Aug	3 - 6	2.4		
TP3	9-Aug	3 - 6	2.7		
TP4	9-Aug	3 - 6	4.3	**Average**	**Avg to 6 ft**
				3.3	7.2

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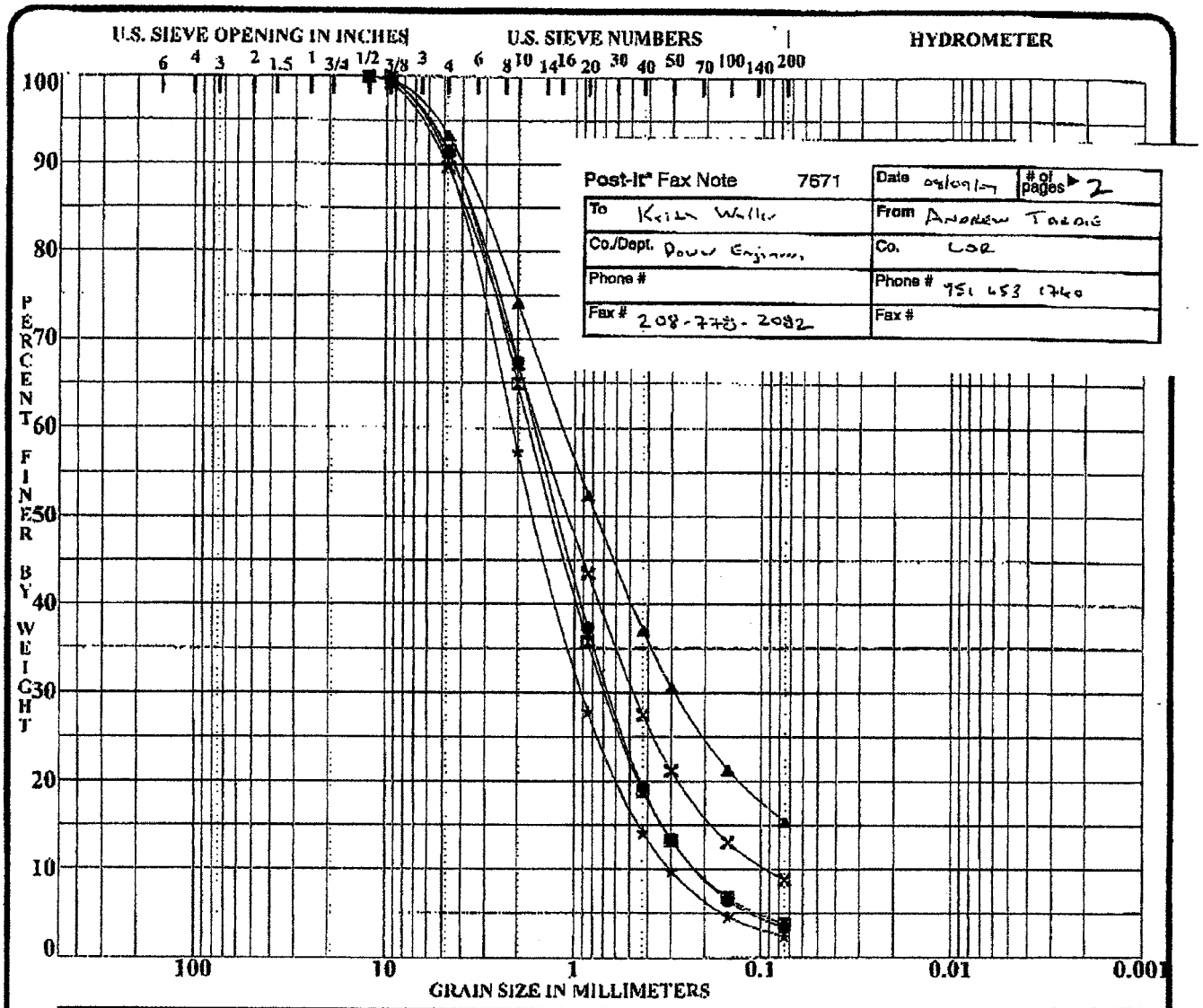
9-Aug-04



Post-It® Fax Note 7671 | Date 08/09/04 | # of pages ▶ 2
To Kevin Weller | From Andrew Tarang
Co./Dept. Power Engineers | Co. LOR
Phone # | Phone # 951 653 1740
Fax # 208-773-2082 | Fax #

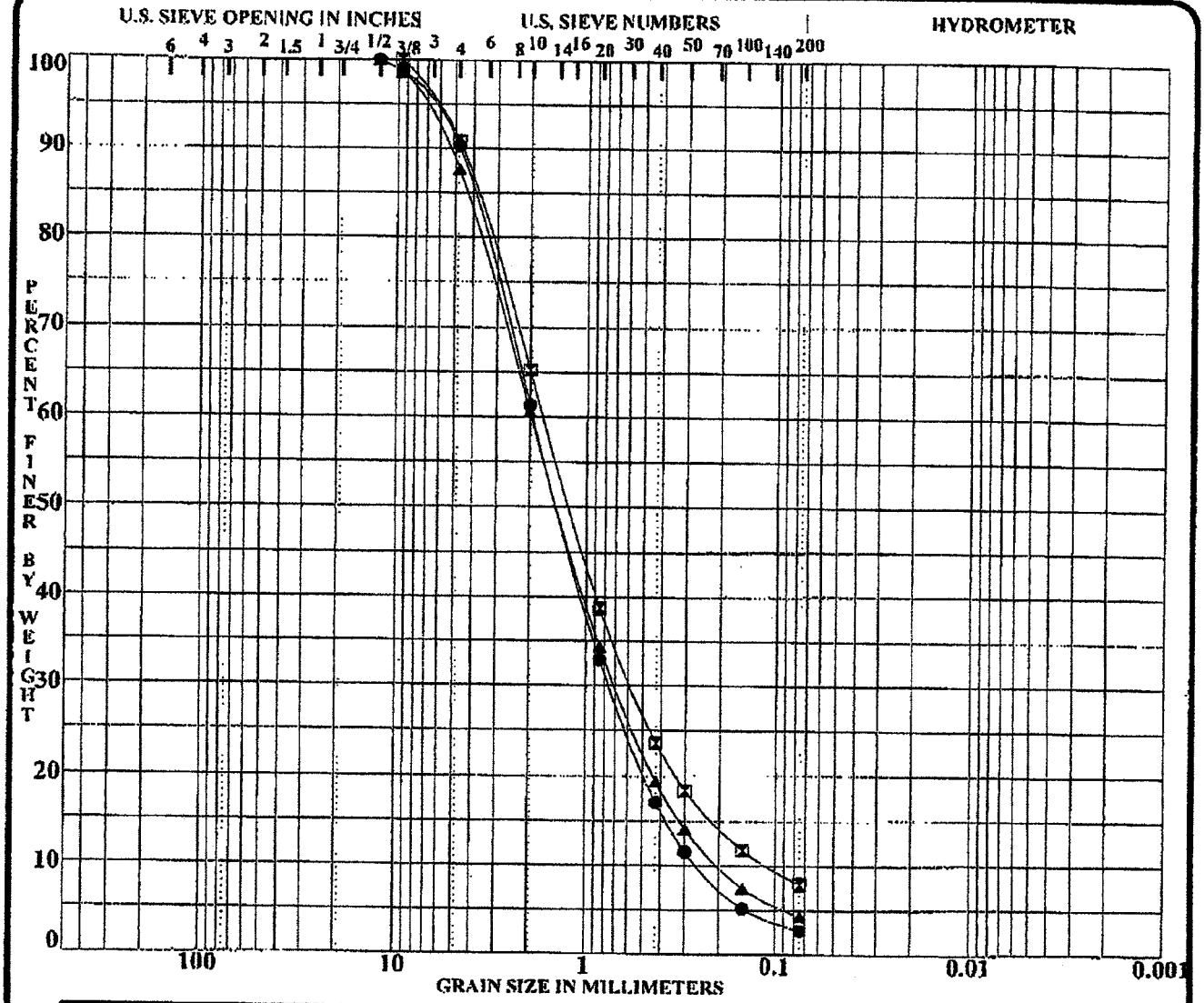
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification			Classification	Cc	Cu
●	TP-1	@ 1-3 ft.	WELL-GRADED SAND SW	1.19	7.6
⊠	TP-1	@ 3-6 ft.	WELL-GRADED SAND SW	1.24	8.2
▲	TP-2	@ 1-3 ft.	SILTY SAND SM		
★	TP-2	@ 3-6 ft.	WELL-GRADED SAND SW	1.25	7.0
✕	TP-3	@ 1-3 ft.	WELL GRADED SAND WITH SILT SW-SM	1.60	16.9

Specimen Identification			D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TP-1	@ 1-3 ft.	12.50	1.62	0.642	0.2139	8.7	87.9	3.4	
⊠	TP-1	@ 3-6 ft.	9.50	1.73	0.672	0.2109	8.3	87.7	3.8	
▲	TP-2	@ 1-3 ft.	12.50	1.15	0.288		6.7	77.8	15.5	
★	TP-2	@ 3-6 ft.	9.50	2.15	0.905	0.3049	10.0	87.6	2.4	
✕	TP-3	@ 1-3 ft.	12.50	1.54	0.473	0.0911	10.4	80.8	8.8	

PROJECT *Acorn Generation Project - Riverside, California* PROJECT NO. *61833.1*
DATE *8/9/04*

GRADATION CURVES
LOR GEOTECHNICAL GROUP, INC.
RIVERSIDE, CALIFORNIA 92507



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

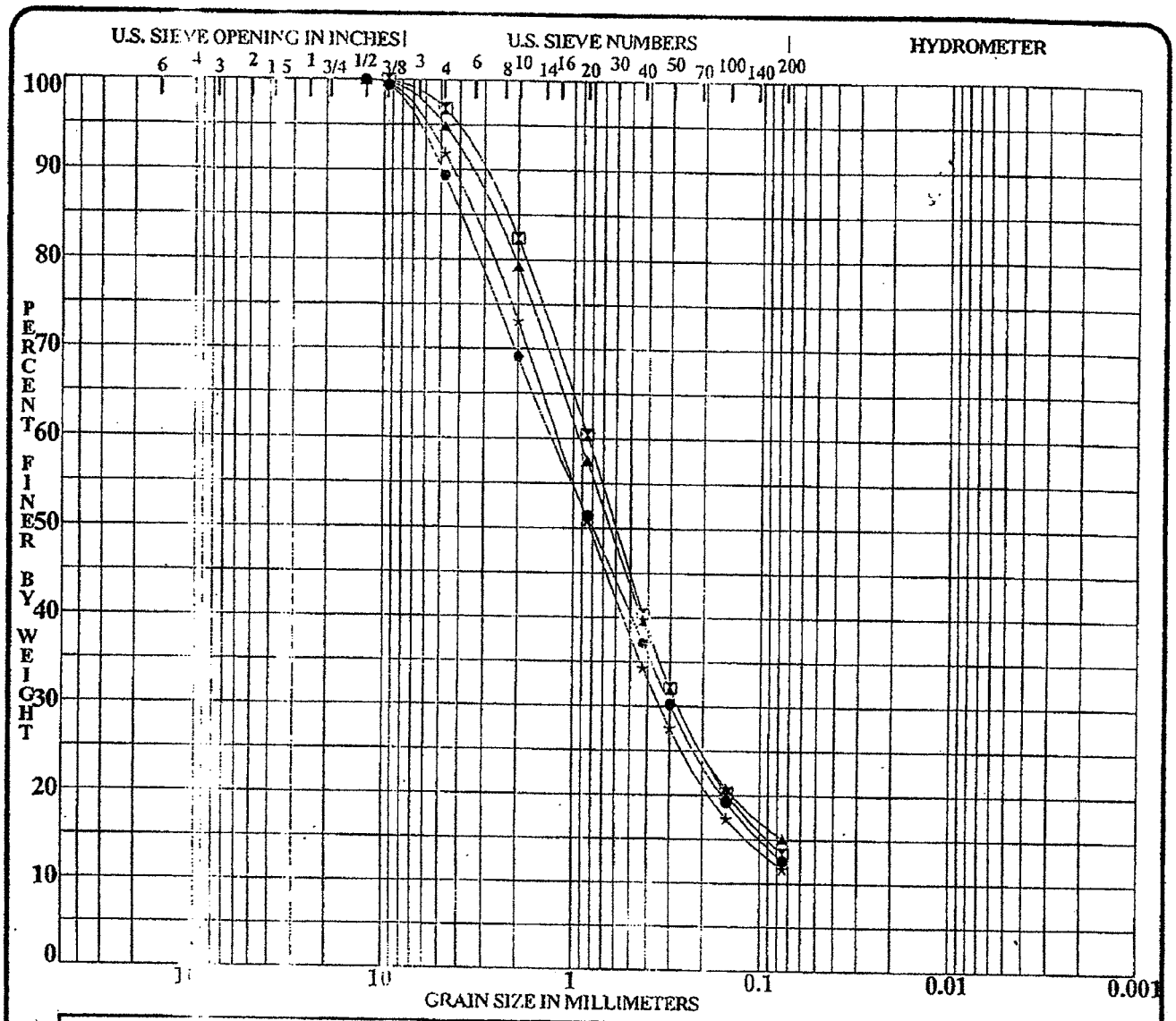
	Specimen Identification		Classification	Cc	Cu
●	TP-3	@ 3-6 ft.	WELL-GRADED SAND SW	1.14	7.5
⊠	TP-4	@ 1-3 ft.	WELL GRADED SAND WITH SILT SW-SM	1.74	15.3
▲	TP-4	@ 3-6 ft.	WELL-GRADED SAND SW	1.25	10.0

	Specimen Identification		D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	TP-3	@ 3-6 ft.	12.50	1.92	0.749	0.2553	9.7	87.6	2.7	
⊠	TP-4	@ 1-3 ft.	9.50	1.69	0.570	0.1105	9.1	83.0	7.9	
▲	TP-4	@ 3-6 ft.	12.50	1.97	0.695	0.1967	12.3	83.4	4.3	

PROJECT *Acorn Generation Project - Riverside, California*

PROJECT NO. *61833.1*
DATE *8/9/04*

GRADATION CURVES
LOR GEOTECHNICAL GROUP, INC.
RIVERSIDE, CALIFORNIA 92507



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification	Soil Classification	SE	RV			Cc	Cu
●	B-02 @ 0-3 ft.	(SM) Silty Sand	35	--				
⊠	B-10 @ 0-3 ft.	(SM) Silty Sand	40	--				
▲	B-11 @ 0-3 ft.	(SM) Silty Sand	57	73				
★	B-26 @ 0-3 ft	(SW-SM) Well Graded Sand w/ silt	36	--			1.56	19.7

	Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
●	B-02 @ 0-3 ft.	12.50	1.29	0.296		10.7	76.8	12.6	
⊠	B-10 @ 0-3 ft.	9.50	0.84	0.265		3.2	83.4	13.4	
▲	B-11 @ 0-3 ft.	12.50	0.94	0.267		5.1	79.8	15.1	
★	B-26 @ 0-3 ft	12.50	1.21	0.340		8.2	80.2	11.6	

PROJECT A[illegible] Generation Project - Riverside, California

PROJECT NO. 61833.1
DATE 12/31/03

GRADATION CURVES
LOR GEOTECHNICAL GROUP, INC.
RIVERSIDE, CALIFORNIA 92507

Enclosure C-1

Trench Pit No.	Depth (ft.)	Description (USCS)	Maximum Dry Density (PCF)	Optimum Moisture (%)
TP-1	1-3	(SW) Well Graded Sand	125.5	9.0
TP-2	1-3	(SM) Silty Sand	136.0	7.5
TP-3	1-3	(SW-SM) Well Graded Sand with Silt	132.5	8.5

SCEC

RIVERSIDE ENERGY RESOURCE CENTER

REVISED PLANT OPERATIONS AIR QUALITY IMPACT ANALYSIS

PREPARED FOR:

City of Riverside Public Utilities Department
2911 Adams Street
Riverside, California 92504

FOR SUBMITTAL TO:

California Energy Commission

PREPARED BY:

SCEC
Air Quality Specialists
1582-1 N. Batavia Street
Orange, California 92867

August 12, 2004

TABLE OF CONTENTS

SECTION		PAGE
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2.0	Air Quality Impact Analysis	1
2.1	Methodology	1
2.2	Air Dispersion Modeling Results	1
2.3	Ambient Air Quality Impacts	2
2.4	AQIA – Normal Facility Operations	2
2.5	AQIA – Commissioning Operations	4
3.0	Health Risk Analysis	5

LIST OF APPENDICIES

APPENDIX A SUPPLEMENTARY INFORMATION

1.0 Introduction

Recent changes were made to the project proposal that could possibly affect air quality. These changes include the relocation of several structures such as storage tanks from the northern region of the facility to the western region of the facility, the reduction of cooling tower PM10 emissions due to intake water treatment, and the possible siting of a ZLD filter press discharge point.

2.0 Air Quality Impact Analysis

A revised dispersion assessment and an air quality impact analysis were conducted to demonstrate the significance of the project's impact resulting from these changes. One assessment was conducted to determine impacts during normal operations and a second analysis was conducted to determine impacts during commissioning operations. An assessment was also conducted to determine if the changes to the plant would suggest the need for a revised health risk assessment. The methodology and results of each analysis are summarized in the following sections.

2.1 Methodology

Revised air dispersion modeling was conducted to provide down-wind emission concentration estimates from the revised project. Modeling methodology was retained from prior analyses, with the following exceptions:

- Several structures were moved at the site and revised in the model including the two large water tanks.
- The cooling tower emission rates were revised to reflect the new water balance and related TDS levels.
- The ZLD system discharge point was added to the site and to the model.

2.2 Air Dispersion Modeling Results

Dispersion model results are contained in Appendix A. Generally the results coincide with those of the most recent previous run. One notable exception is the annual ambient PM10 and PM2.5 concentrations from the combined plant. The new model results indicate that annual average PM emission concentrations will be significantly lower than the previous assessment. This is due to a significant reduction in cooling tower emission rates. Previously, estimated maximum cooling tower emissions rates reflected higher total dissolved solids (TDS) rates in the cooling tower water than the levels that are now anticipated to exist (2,644 ppm vs. 1,250 ppm).

2.3 Ambient Air Quality Impacts

Appendix A contains the results of an air quality impact analysis (AQIA) that was conducted to evaluate the projects potential impact on ambient air quality. The pollutants analyzed included the following:

- Nitrogen Dioxide (NO_2)
- Carbon Monoxide (CO)
- Particulate Matter (PM_{10} and $PM_{2.5}$)
- Sulfur Dioxide (SO_2) and Sulfate (as SOx)

A NO_x-to-NO_2 conversion factor of 0.59 was used to conduct the annual NO_2 impact analysis in accordance with SCAQMD guidance. No adjustment was applied to the hourly NO_2 analysis. Total SO_X emissions were used to represent the sulfates and SO_2.

The AQIA included the use of ISCST3 dispersion model results to determine ambient down-wind pollutant ground-level concentrations ($\mu g/m^3$)/(1.0 g/s), which were then multiplied by the individual pollutant emission rates (g/s) for all pollutants except PM. For PM impacts, actual hourly emissions from the various sources were input into the model to determine final $\mu g/m^3$ values. The analysis incorporates the maximum concentrations calculated by the model for each of the relevant averaging time periods (1-Hour, 3-Hour, 8-Hour, 24-Hour, and Annual). Downwind concentrations calculated by the model were converted into ppm values and added to the background ambient data, then compared to the most stringent standard to determine if the project will cause an exceedance of an air quality standard. For pollutants where the region is already in violation of air quality standards, the levels of significant increase as defined in SCAQMD Rule 1303 were used to determine significance. SCAQMD has not yet defined a level of significance for increases in PM2.5 ambient concentrations.

2.4 AQIA - Normal Facility Operations

The AQIA included several different plant operating scenarios. The first scenario evaluated was a normal year of operation. This included the following; (1) 1-hour NO_x and CO emission rates were based on a startup emissions scenario, which is the most conservative estimate; (2) annual NO_x emission estimates are an average that take into account typical startup, shutdown, maintenance and normal operation during the course of an operation year divided by 8760 hours; (3) 8-hour CO emission estimates reflect four hours of startup and four hours of shutdown operation.

Table 1 includes a summary of the air quality impact analysis for operations during a normal year. Background ambient data reflect the highest levels recorded for the applicable averaging period at the Rubidoux, Riverside and Norco monitoring stations between the years of 1997 and 2003. The analysis results indicate that when combined with background ambient concentrations, the projects emissions will not lead to a violation of state or federal standards for NO_2, CO, Sulfates and 1-hour SO_2.

Ambient levels of PM are already in excess of the most stringent 24-hour and annual ambient air quality standards. SCAQMD has established thresholds for PM10 increases to determine the significance of a project's impacts. For the 24-hour average the SCAQMD level of significance is 2.5 $\mu g/m^3$ increase. The 24-hour increase from the project is projected to be 1.78 $\mu g/m^3$. For the annual average increase, the SCAQMD level of significance is 1.0 $\mu g/m^3$. The annual average increase from the project is expected to be 0.078 $\mu g/m^3$. SCAQMD has not yet established significance thresholds in Rule 1303 for PM2.5, but the increase in ambient levels of PM2.5 are less than 3% of the most stringent 24-hour standard and less than 1% of the most stringent annual standard.

The year 2000 ambient data for 24-hour SO_2 concentrations implies that the region is already exceeding the most stringent standard. As such, the impact from the project would add to an existing exceedance, but the impact from the project is less than 1% of the ambient air quality standard. One must also consider the anomaly that exists in the year 2000 data. The year 2000 results are twice as high as the results in any of the three years preceding 2000, and of the three years following 2000. Based upon the second highest background levels from 1997 through 2003, the project would not cause an exceedance of the most stringent 24-hour air quality standard.

The air quality impact analysis demonstrates that the project will not lead to, or significantly add to, an exceedance of the most stringent air quality standards when both turbines and the cooling tower are in full operation, including startup operations. The project's ambient air quality impacts are demonstrated to be below a level of significance.

Table 1
Summary of Air Quality Impact Analysis
Normal Year Operations
Point of Maximum Impact – MEI
Riverside Energy Resource Center

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Most Stringent Standard
NO_2	1 - Hour (ppm)	0.0128	0.15	2001, Rubidoux	0.16	0.25
NO_2	Annual (ppm)	0.00001	0.0262	1999, Rubidoux	0.03	0.0534
CO	1 - Hour (ppm)	0.0169	11	1997, Riverside	11.02	20
CO	8 - Hour (ppm)	0.0108	5.8	1997, Rubidoux	5.81	9
PM	24 - Hour (μg/m3)	1.7841*	164	2003, Rubidoux	165.78	50*
PM_{10}	Annual (μg/m3)	0.0779*	72.3	1999, Rubidoux	72.38	20*
$PM_{2.5}$	24 - Hour (μg/m3)	1.7841	119.6	2000, Rubidoux	121.38	65
$PM_{2.5}$	Annual (μg/m3)	0.0779	31.1	2001, Rubidoux	31.18	12
Sulfate	24 - Hour (μg/m3)	0.9548	11.7	2000, Rubidoux	12.65	25
SO_2	1-hour (ppm)	0.0009	0.11	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.0004	0.041	2000, Rubidoux	0.04	0.041

* Because ambient PM concentrations exceed the most stringent air quality standard, an alternative significance threshold has been defined by SCAQMD to be an increase of 1.0 $\mu g/m^3$ on an annual basis and an increase of 2.5 $\mu g/m^3$ on a 24-hour basis at the nearest residential receptor location.

2.5 AQIA - Commissioning Operations

The second air quality impact assessment scenario reflects operations during the commissioning operation year. This analysis includes the following averaging periods; (1) 1-hour NO_x and CO emission rates were based on uncontrolled operations, which is the most conservative estimate. (2) Annual NO_x emission estimates are an average that take into account typical commissioning, startup, shutdown, and normal operation during the course of an operation year divided by 8760 hours. (3) 8-hour CO emission estimates reflect uncontrolled operations.

Table 2 provides a summary of the air quality impact analysis for operations during commissioning operations. Analysis results for PM_{10}, $PM_{2.5}$, sulfates and SO_2 are the same as for normal operations. Analysis results for NO_2 and CO are higher than the results for normal operations because emission control systems are assumed to be disabled during the 200-hour commissioning period. Even with the higher emissions and with both turbines assumed to be in operation, the project will not cause a violation of

short-term ambient air quality standards. The ambient air quality impacts of the project are below a level of significance.

Table 2
Summary of Air Quality Impact Analysis
Commission Operations
Point of Maximum Impact – MEI
Riverside Energy Resource Center

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Most Stringent Standard
NO_2	1 - Hour (ppm)	0.035	0.15	2001, Rubidoux	0.185	0.25
NO_2	Annual (ppm)	Na	0.03	1999, Rubidoux	Na	0.0534
CO	1 - Hour (ppm)	0.059	11.0	1997, Riverside	11.1	20.0
CO	8 - Hour (ppm)	0.041	5.8	1997, Rubidoux	5.8	9.0
PM	24 - Hour (μg/m3)	1.784*	164.0	2003, Rubidoux	165.8	50.0*
PM_{10}	Annual (μg/m3)	Na	72.30	1999, Rubidoux	Na	20.0
$PM_{2.5}$	24 - Hour (μg/m3)	1.784	119.6	2000, Rubidoux	121.4	65.0*
$PM_{2.5}$	Annual (μg/m3)	Na	31.10	2001, Rubidoux	Na	12.0**
Sulfate	24 - Hour (μg/m3)	0.955	11.700	2000, Rubidoux	12.65	25.00
SO_2	1-hour (ppm)	0.0009	0.110	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.0004	0.041	2000, Rubidoux	0.04	0.04

* Because ambient PM concentrations exceed the most stringent air quality standard, an alternative significance threshold has been defined by SCAQMD to be an increase of 2.5 $\mu g/m^3$ on a 24-hour basis at the nearest residential receptor location.

3.0 Screening Health Risk Assessment

A review of the health risk assessment has determined that a subsequent analysis is not necessary since the down-wind concentration dominated by the cooling tower emissions decreased as a result of the modification presented herein. The health risk attributed to this project is dominated by cooling tower emissions and dispersion characteristics. A dispersion analysis of the revised cooling tower emission parameters was conducted to determine if the point of maximum impact changed, either the location or the down-wind concentrations. The revised cooling tower emission parameters did not effect the location of the point of maximum impact, however the concentrations were lower. As such a revised health risk assessment was determined to not be necessary.

SCEC

APPENDIX A

Revised Generating Station Air Dispersion Modeling Results Summary
Riverside Energy Resource Center
8/10/04

Description	Time Period	Maximum Concentrations ($\mu g/m^3$)		Receptor UTM Coordinates
Run#: RIVERSIDECEC01b				
- Generating Station Emissions	1-Hour	5.79068	UTM E	458796
- Normal Operations			UTM N	3760343.5
- Gas Turbine Emissions Only				
- No PM Emissions	3-Hour	5.71629	UTM E	458796
- ($\mu g/m^3$ @ 1.00 g/s for NOx, CO, SOx)			UTM N	3760343.5
	8-Hour	4.03384	UTM E	458996
			UTM N	3760343.5
	24-Hour	2.33892	UTM E	458996
			UTM N	3760343.5
	Annual	0.23849	UTM E	459496
			UTM N	3757443.5
Run#: RIVERSIDECEC02b				
- Generating Station Emissions	24-Hour	1.78406	UTM E	458996
- Normal and Commissioning Operations			UTM N	3760343.5
- 24-Hour PM Run				
- Cooling Tower PM Emission Rate: 0.01165 lbs/hr (per cell)				
- ZLD PM Emission Rate: 0.00373 lbs/hr				
- Gas Turbine PM Emission Rate: 3.0 lbs/hr (per gas turbine)				
Run#: RIVERSIDECEC03b				
- Generating Station Emissions	Annual	0.07789	UTM E	458360
- Normal and Commissioning Operations			UTM N	3757935.75
- Annual PM Run				
- Cooling Tower Emission Rate: 0.00354 lbs/hr (per cell-annualized)				
- ZLD Emission Rate: 0.001 lbs/hr (annualized)				
- Gas Turbine Emission Rate: 0.450 lbs/hr (annualized) (per gas turbine)				

Revised Air Quality Impact Analysis - Emission Parameters
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

Equipment Information:

Equipment Type: Gas Turbines Manufacturer: GE Model: LM6000	Capacity: - Output (MW): 100 # of Units: 2	Fuel: Natural Gas HHV: 1050

Emission Rates:

Pollutant	Per Unit Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
NO_x	16.47	32.94	4.15	1-Hour	startup hour operation
NO_x	1.096	2.19	0.28	Annual	annual emissions averaged over 8760 hours*
CO	13.20	26.40	3.33	1-Hour	startup hour operation
CO	12.19	24.38	3.07	8-Hour	average of 4 start and 4 shutdown hours**
PM_{10}	3.00	6.00	0.76	24-Hour	normal hour operation
PM_{10}	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours***
$PM_{2.5}$	3.00	6.00	0.76	24-Hour	normal hour operation
$PM_{2.5}$	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours***
SO_x	1.62	3.24	0.41	1 hour / 3-Hour	normal hour operation
SO_x	1.62	3.24	0.41	24-Hour	normal hour operation

Emission rates on this page exclude the cooling tower because PM rates are not normalized.
Cooling tower emissions are included in the PM worksheets.

* Annual average 1 hr NOx = ((4.49lb/hr x 910 normal hours) + (16.47lb/hr x 200 startup hours) + (6.6lb/hr x 200 shutdown hours) + (44.93lb/hr x 20 maintenance hours)) / 8760hrs/yr

** 1-hr CO averaged over 8 hrs = ((13.2lb/hr x 4 startup hours) + (11.18lb/hr x 4 shutdown hours)) / 8 hours

*** Annual average 1 hr PM10 = ((3.0lb/hr x 910 normal hours)+(2.74lb/hr x 200 startup hours) + (3.0lb/hr x 200 shutdown hours)+(3.0lb/hr x 20 maintenance hours)) / 8760 hrs/yr

PM10 assumed to be 100% PM2.5

Revised Air Quality Impact Analysis - Significant Change In Air Quality
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

Modeling Results:

1st Max =	5.79068	(ug/m^3)/(g/sec)	1 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	5.71629	(ug/m^3)/(g/sec)	3 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	4.03384	(ug/m^3)/(g/sec)	8 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	2.33892	(ug/m^3)/(g/sec)	24 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	0.23849	(ug/m^3)/(g/sec)	Annual Average Concentration	(@ 1.0 g/s per turbine)

Air Quality Impacy Analysis:

Pollutant	Averaging Time	Emission Rate (g/sec)	Maximum Impact (ug/m^3)	SCAQMD Significant Change In Air Quality Threshold (ug/m^3)
NO_2	1 - Hour	4.15	**24.0318**	**20.0**
NO_2	Annual	0.28	**0.0658**	**1.0**
CO	1 - Hour	3.33	**19.2604**	**1100.0**
CO	8 - Hour	3.07	**12.3904**	**500.0**
PM	24 - Hour	0.11	**1.78406**	**2.5**
PM_{10}	Annual	0.11	**0.07789**	**1.0**
$PM_{2.5}$	24 - Hour	0.76	**1.78406**	**N/A**
$PM_{2.5}$	Annual	0.11	**0.07789**	**N/A**
Sulfate	24-Hour	0.41	**0.9548**	**N/A**
SO2	1 - Hour	0.41	**2.3638**	**N/A**
SO2	24-Hour	0.41	**0.9548**	**N/A**

urce . Model input/output are not normalized

Note:

- X/Q Max values (ug/m^3/g/sec) are taken from the ISC 3 model.
- Impacts analysis utilized the standard stack release parameters.

Revised Air Quality Impact Analysis - Summary of Ambient Air Quality Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

Ambient Air Quality Analysis:

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Ambient Standard
NO_x	1 - Hour (ppm)	0.0128	0.1500	2001, Rubidoux	0.16	0.25
NO_x	Annual (ppm)	0.0000	0.0262	1999, Rubidoux	0.03	0.05
CO	1 - Hour (ppm)	0.0169	11.0000	1997, Riverside Magnolia	11.02	20.00
CO	8 - Hour (ppm)	0.0108	5.8000	1997, Rubidoux	5.81	9.00
PM	24 - Hour ($\mu g/m^3$)	1.7841	164.0000	2003, Rubidoux	165.78	50.00
PM_{10}	Annual ($\mu g/m^3$)	0.0779	72.3000	1999, Rubidoux	72.38	20.00
$PM_{2.5}$	24 - Hour ($\mu g/m^3$)	1.7841	119.6000	2000, Rubidoux	121.38	65.00
$PM_{2.5}$	Annual ($\mu g/m^3$)	0.0779	31.1000	2001, Rubidoux	31.18	12.00
Sulfate	24 - Hour ($\mu g/m^3$)	0.9548	11.7000	2002, Rubidoux	12.65	25.00
SO_2	1-hour (ppm)	0.0009	0.1100	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.0004	0.0410	2000, Rubidoux	0.04	0.04

Revised Air Quality Impact Analysis - Ambient NO_2 Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

1-Hour NO_2 Analysis:

1. Convert NO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Hour $\mu g/m^3$:	24.0	OLM Ratio	1.00
NO2 MW:	46.0	(Valid only for consruction impacts)	
Conversion:	0.0245		

So:

ppm NO2= 0.0128

2. Add NO2 1-hour background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.013
Ambient background data (ppm): 0.15 Station 4144 - Rubidoux - Year 2001

So:

Project + Background (ppm): 0.16
Most Stringent NO2 1-Hour Standard (ppm): 0.25

Annual NO_2 Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Annual $\mu g/m^3$:	0.07	OLM Ratio	0.59
NO2 MW:	46.0		
Conversion:	0.0245		

So:

ppm NO2 = 0.00002

2. Add NO2 annual background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.00002
Ambient background data (ppm): 0.0262 Station 4144 - Rubidoux - Year 1999

So:

Project + Background (ppm): 0.0262
Most Stringent NO2 Annual Standard (ppm): 0.0534

Revised Air Quality Impact Analysis - Ambient CO Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

1-Hour CO Analysis:

1. Convert CO 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 1-Hour $\mu g/m^3$:	19.3
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO =	0.0169

2. Add CO 1-hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.017	
Ambient background data (ppm):	11.0	Station 4146 - Riverside- Magnolia - 1997

So:

Project + Background (ppm):	11.02
Most Stringent CO 1-Hour Standard (ppm):	20.0

8-Hour CO Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 8-Hour $\mu g/m^3$:	12.4
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO=	0.011

2. Add CO 8-Hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.011	
Ambient background data (ppm):	5.8	Station 4144 - Rubidoux - 1997

So:

Project + Background (ppm):	5.81
Most Stringent CO 8-Hour Standard (ppm):	9.0

Revised Air Quality Impact Analysis - Ambient PM_{10} Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

24-Hour PM_{10} Analysis:

1. Add PM_{10} 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$):	1.784	
Ambient background data ($\mu g/m^3$):	164.0	Station 4144 - Rubidoux - 2003

So:

Project + Background ($\mu g/m^3$):	165.8
Most Stringent PM_{10} 24-Hour Standard ($\mu g/m^3$):	50.0

Annual PM_{10} Analysis:

1. Add PM_{10} Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$):	0.078	
Ambient background data ($\mu g/m^3$):	72.3	Station 4144 - Rubidoux - 1999

So:

Project + Background ($\mu g/m^3$):	72.38
Most Stringent PM_{10} Annual Standard ($\mu g/m^3$):	20.0

Revised Air Quality Impact Analysis - Ambient $PM_{2.5}$ Analysis
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

24-Hour $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 1.78
Ambient background data ($\mu g/m^3$): 119.6 Station 4144 - Rubidoux - Year 2000

So:

Project + Background ($\mu g/m^3$): 121.4
Most Stringent $PM_{2.5}$ 24-Hour Standard ($\mu g/m^3$): 65.0

Annual $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.08
Ambient background data ($\mu g/m^3$): 31.1 Station 4144 - Rubidoux - Year 2001

So:

Project + Background ($\mu g/m^3$): 31.18
Most Stringent $PM_{2.5}$ Annual Standard ($\mu g/m^3$): 12.0

Revised Air Quality Impact Analysis - Ambient SO / Sulfate
GE Gas Turbines - Normal Operations
Riverside ERC
Revision Date: 8/10/04

24-Hour Particulate Sulfate Analysis:

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.95
Ambient background data ($\mu g/m^3$): 11.7 Station 4144 - Rubidoux - Year 2002

So:

Project + Background ($\mu g/m^3$): 12.65
Most Stringent SO_2 24-Hour Standard ($\mu g/m^3$): 25.0

1-Hour SO_2 Analysis:

1. Convert SO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 1-Hour $\mu g/m^3$:	2.364
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000905

2. Add SOx 1-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm): 0.000905
Ambient background data (ppm): 0.11 Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm): 0.11
Most Stringent SO_2 24-Hour Standard (ppm): 0.25

24-Hour SO_2 Analysis:

1. Convert SO2 24-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 24-Hour $\mu g/m^3$:	0.955
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000365

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm): 0.00037
Ambient background data (ppm): 0.041 Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm): 0.041
Most Stringent SO_2 24-Hour Standard (ppm): 0.040

Revised Air Quality Impact Analysis - Emission Parameters
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

Equipment Information:

Equipment Type: Gas Turbines Manufacturer: GE Model: LM6000	Capacity: - Output (MW): 100 # of Units: 2	Fuel: Natural Gas HHV: 1050

Emission Rates:

Pollutant	Per Unit Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
NO_x	44.93	89.86	11.32	1-Hour	Uncontrolled 100% Load
NO_x	2.019	4.04	0.51	Annual	annual emissions averaged over 8760 hours*
CO	45.93	91.86	11.57	1-Hour	Uncontrolled 100% Load
CO	45.93	91.86	11.57	8-Hour	Uncontrolled 100% Load
PM_{10}	3.00	6.00	0.76	24-Hour	normal hour operation
PM_{10}	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours**
$PM_{2.5}$	3.00	6.00	0.76	24-Hour	normal hour operation
$PM_{2.5}$	0.450	0.90	0.11	Annual	annual emissions averaged over 8760 hours**
SO_x	1.62	3.24	0.41	1 hour / 3-Hour	normal hour operation
SO_x	1.62	3.24	0.41	24-Hour	normal hour operation

Emission rates on this page exclude the cooling tower because PM pates are not normalized.
Cooling tower emissions are included in the PM worksheets.

* Annual average 1 hr NOx = ((44.93 lb/hr x 200 commission hrs) + (4.49 lb/hr x 710 normal hrs) + (16.47lb/hr x 200 startup hours) + (6.6lb/hr x 200 shutdown hours)+(44.93lb/hr x 20 maintenance hours)) / 8760 hours/yr

** Annual average 1 hr PM10 = ((3.0lb/hr x 200 commissioning hours)+(3.0 lb/hr x 710 normal hours) + (2.74lb/hr x 200 startup hours) + (3.0lb/hr x 200 shutdown hours) +(3.0lb/hr x 20 maintenance hours)) / 8760 hours/year
PM10 assumed to be 100% PM2.5

*** 1-Hour, 3-Hour, 8-Hour and 24-Hour emission impacts also represent maintenance operations.

Revised Air Quality Impact Analysis - Significant Change In Air Quality
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

Modeling Results:

1st Max =	5.79068	(ug/m$^{3)}$/(g/sec)	1 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	5.71629	(ug/m$^{3)}$/(g/sec)	3 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	4.03384	(ug/m$^{3)}$/(g/sec)	8 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	2.33892	(ug/m$^{3)}$/(g/sec)	24 - Hour Average Concentration	(@ 1.0 g/s per turbine)
1st Max =	0.23849	(ug/m$^{3)}$/(g/sec)	Annual Average Concentration	(@ 1.0 g/s per turbine)

** Annual average concentration values for PM emissions are based on actual emission rates and not 1.0 g/s.

Air Quality Impacy Analysis:

Pollutant	Averaging Time	Emission Rate (g/sec)	Maximum Impact (ug/m^3)	SCAQMD Significant Change In Air Quality Threshold (ug/m^3)
NO_2	1 - Hour	11.32	**65.56**	**20.0**
NO_2	Annual	0.51	**0.12**	**1.0**
CO	1 - Hour	11.57	**67.02**	**1100.0**
CO	8 - Hour	11.57	**46.68**	**500.0**
PM	24 - Hour	0.76	**1.78406**	**2.5**
PM_{10}	Annual	0.11	**0.07789**	**1.0**
$PM_{2.5}$	24 - Hour	0.76	**1.78406**	**N/A**
$PM_{2.5}$	Annual	0.11	**0.07789**	**N/A**
Sulfate	24-Hour	0.41	**0.95**	**N/A**
SO2	1 - Hour	0.41	**2.36**	**N/A**
SO2	24-Hour	0.41	**0.95**	**N/A**

Note:
- X/Q Max values (ug/m^3/g/sec) are taken from the ISC 3 model.
- Impacts analysis utilized the standard stack release parameters.
- PM rates differ by source and model input/output are not normalized for PM emissions.

Revised Air Quality Impact Analysis - Summary of Ambient Air Quality Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

Ambient Air Quality Analysis:

Pollutant	Averaging Time	Project Impacts	Ambient Background	Year of Maximum Background	Total Impacts (Project + Ambient)	Ambient Standard
NO_x	1 - Hour (ppm)	0.035	0.15	2001, Rubidoux	0.185	0.25
NO_x	Annual (ppm)	0.00004	0.03	1999, Rubidoux	0.026	0.0534
CO	1 - Hour (ppm)	0.059	11.0	1997, Riverside Magnolia	11.1	20.0
CO	8 - Hour (ppm)	0.041	5.8	1997, Rubidoux	5.8	9.0
PM	24 - Hour ($\mu g/m^3$)	1.784	164.0	2003, Rubidoux	165.8	50.0
PM_{10}	Annual ($\mu g/m^3$)	0.078	72.30	1999, Rubidoux	72.4	20.0
$PM_{2.5}$	24 - Hour ($\mu g/m^3$)	1.784	119.6	2000, Rubidoux	121.4	65.0
$PM_{2.5}$	Annual ($\mu g/m^3$)	0.078	31.10	2001, Rubidoux	31.2	12.0
Sulfate	24 - Hour ($\mu g/m^3$)	0.955	11.700	2002, Rubidoux	12.65	25.00
SO_2	1-hour (ppm)	0.00090	0.110	2000, Rubidoux	0.11	0.25
SO_2	24-hour (ppm)	0.0004	0.041	2000, Rubidoux	0.041	0.040

Revised Air Quality Impact Analysis - Ambient NO_2 Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

1-Hour NO_2 Analysis:

1. Convert NO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Hour $\mu g/m^3$:	65.6	OLM Ratio	1.00
NO2 MW:	46.0	(Valid only for consruction impacts)	
Conversion:	0.0245		

So:

ppm NO2= 0.0349

2. Add NO2 1-hour background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.035
Ambient background data (ppm): 0.15 Station 4144 - Rubidoux - Year 2001

So:

Project + Background (ppm): 0.18
Most Stringent NO2 1-Hour Standard (ppm): 0.25

Annual NO_2 Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm NO2 = ($\mu g/m^3$) (0.0245/NO2 MW)

Where:

NO2 1-Annual $\mu g/m^3$:	0.12	OLM Ratio	0.59
NO2 MW:	46.0		
Conversion:	0.0245		

So:

ppm NO2 = 0.00004

2. Add NO2 annual background ambient data to projects modeling impacts.

ppm NO2 = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm): 0.00004
Ambient background data (ppm): 0.0262 Station 4144 - Rubidoux - Year 1999

So:

Project + Background (ppm): 0.0262
Most Stringent NO2 Annual Standard (ppm): 0.0534

Revised Air Quality Impact Analysis - Ambient CO Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

1-Hour CO Analysis:

1. Convert CO 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 1-Hour $\mu g/m^3$:	67.0
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO =	0.0586

2. Add CO 1-hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.059	
Ambient background data (ppm):	11.0	Station 4146 - Riverside- Magnolia - 1997

So:

Project + Background (ppm):	11.06
Most Stringent CO 1-Hour Standard (ppm):	20.0

8-Hour CO Analysis:

1. Convert annual project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm CO = ($\mu g/m^3$) (0.0245/CO MW)

Where:

CO 8-Hour $\mu g/m^3$:	46.7
CO MW:	28.0
Conversion:	0.0245

So:

ppm CO=	0.041

2. Add CO 8-Hour background ambient data to projects modeling impacts.

ppm CO = (projects modeling impacts + background ambient data)

Where:

Projects modeling impacts (ppm):	0.041	
Ambient background data (ppm):	5.8	Station 4144 - Rubidoux - 1997

So:

Project + Background (ppm):	5.84
Most Stringent CO 8-Hour Standard (ppm):	9.0

Revised Air Quality Impact Analysis - Ambient PM_{10} Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

24-Hour PM_{10} Analysis:

1. Add PM_{10} 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 1.784
Ambient background data ($\mu g/m^3$): 164.0 Station 4144 - Rubidoux - 2003

So:

Project + Background ($\mu g/m^3$): 165.8
Most Stringent PM_{10} 24-Hour Standard ($\mu g/m^3$): 50.0

Annual PM_{10} Analysis:

1. Add PM_{10} Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.078
Ambient background data ($\mu g/m^3$): 72.3 Station 4144 - Rubidoux - 1999

So:

Project + Background ($\mu g/m^3$): 72.38
Most Stringent PM_{10} Annual Standard ($\mu g/m^3$): 20.0

Revised Air Quality Impact Analysis - Ambient $PM_{2.5}$ Analysis
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

24-Hour $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$):	1.7841	
Ambient background data ($\mu g/m^3$):	119.6	Station 4144 - Rubidoux - Year 2000

So:

Project + Background ($\mu g/m^3$):	121.4
Most Stringent $PM_{2.5}$ 24-Hour Standard ($\mu g/m^3$):	65.0

Annual $PM_{2.5}$ Analysis:

1. Add $PM_{2.5}$ Annual background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$):	0.0779	
Ambient background data ($\mu g/m^3$):	31.1	Station 4144 - Rubidoux - Year 2001

So:

Project + Background ($\mu g/m^3$):	31.18
Most Stringent $PM_{2.5}$ Annual Standard ($\mu g/m^3$):	12.0

Revised Air Quality Impact Analysis - Ambient SO / Sulfate
GE Gas Turbines - Commission Operations
Riverside ERC
Revision Date: 8/10/04

24-Hour Particulate Sulfate Analysis:

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts ($\mu g/m^3$): 0.95
Ambient background data ($\mu g/m^3$): 11.7 Station 4144 - Rubidoux - Year 2002

So:

Project + Background ($\mu g/m^3$): 12.65
Most Stringent SO_2 24-Hour Standard ($\mu g/m^3$): 25.0

1-Hour SO_2 Analysis:

1. Convert SO2 1-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 1-Hour $\mu g/m^3$:	2.364
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000905

2. Add SOx 1-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm): 0.000905
Ambient background data (ppm): 0.11 Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm): 0.11
Most Stringent SO_2 24-Hour Standard (ppm): 0.25

24-Hour SO_2 Analysis:

1. Convert SO2 24-hour project modeling impact results to ppm for ambient analysis (ambient standards are in ppm).

ppm SO2 = ($\mu g/m^3$) (0.0245/SO2 MW)

Where:

SO2 24-Hour $\mu g/m^3$:	0.955
SO2 MW:	64.0
Conversion:	0.0245

So:

ppm SO2=	0.000365

1. Add SOx 24-Hour background ambient data to projects modeling impacts.

Where:

Projects modeling impacts (ppm): 0.00037
Ambient background data (ppm): 0.041 Station 4144 - Rubidoux - Year 2000

So:

Project + Background (ppm): 0.041
Most Stringent SO_2 24-Hour Standard (ppm): 0.040

Sensitive Receptor List
Riverside ERC
8/10/04

Receptor Description	Elevation	Coordinates	
Residence A – Nearest Residential Receptor (Kennel)	760'	UTME 458201.6	UTMN 3757614.4
Residence B – Nearby Residential Receptor	830'	UTME 459280	UTMN 3757620
Residence C – Nearby Residential Receptor	770'	UTME 458120	UTMN 3758880
Residence D – Nearby Residential Receptor	740'	UTME 457090	UTMN 3757570
School A – Nearest School	810'	UTME 458430	UTMN 3759250
School B – Nearest School	760'	UTME 456360	UTMN 3756590

Riverside ERC

Revised AQIA Modeling

Gas Turbines Only

8/10/04


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                    ISCST3 - (DATED 02035)

             ISCST3X  PC (32 BIT) VERSION  4.0.0
            (C) COPYRIGHT 1991-2002, Trinity Consultants

 Run Began on  8/10/2004 at 13:29:26

 ** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC01b.dat
 ** Trinity Consultants


 CO STARTING
 CO TITLEONE  Riverside ERC
 CO TITLETWO  Revised CEC Normal Run
 CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
 CO AVERTIME  1  3  8  24  ANNUAL
 CO POLLUTID  OTHER
 CO TERRHGTS  ELEV
 CO RUNORNOT  RUN
 CO FINISHED

 SO STARTING
 SO ELEVUNIT  METERS
 SO LOCATION  SRC1  POINT  458296.0  3757943.6  222.1992
 ** SRCDESCR  Turbine #1
 SO LOCATION  SRC2  POINT  458296.0  3757980.1  222.1992
 ** SRCDESCR  Turbine #2
 SO SRCPARAM  SRC1  5.000000E-01  24.384  716.4833  22.02661  3.9624
 SO SRCPARAM  SRC2  5.000000E-01  24.384  716.4833  22.02661  3.9624
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE MAXIMUM 10 1-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE	RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE
1.	5.79068	(81122402)	AT	(458696.00, 3760243.50)	DC	6.	5.77970	(81112906)	AT	(458696.00, 3760243.50)	DC
2.	5.78753	(81020107)	AT	(458696.00, 3760243.50)	DC	7.	5.77833	(81020224)	AT	(458696.00, 3760243.50)	DC
3.	5.78442	(81122802)	AT	(458696.00, 3760243.50)	DC	8.	5.77833	(81030307)	AT	(458696.00, 3760243.50)	DC
4.	5.78135	(81013022)	AT	(458696.00, 3760243.50)	DC	9.	5.77670	(81120804)	AT	(458696.00, 3760243.50)	DC
5.	5.77970	(81011003)	AT	(458696.00, 3760243.50)	DC	10.	5.77670	(81120805)	AT	(458696.00, 3760243.50)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE MAXIMUM 10 3-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE	RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE
1.	5.71629	(81070403)	AT	(458796.00, 3760343.50)	DC	6.	5.37823	(81070403)	AT	(458796.00, 3760243.50)	DC
2.	5.56121	(81070524)	AT	(458996.00, 3760343.50)	DC	7.	5.31541	(81070403)	AT	(458896.00, 3760443.50)	DC
3.	5.55888	(81070403)	AT	(458996.00, 3760343.50)	DC	8.	5.26241	(81070524)	AT	(458996.00, 3760443.50)	DC
4.	5.55743	(81070324)	AT	(458996.00, 3760343.50)	DC	9.	5.26026	(81070403)	AT	(458996.00, 3760443.50)	DC
5.	5.50239	(81070403)	AT	(458896.00, 3760343.50)	DC	10.	5.25892	(81070324)	AT	(458996.00, 3760443.50)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

1

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE MAXIMUM 10 8-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE	RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE
1.	4.03384	(81070408)	AT	(458996.00, 3760343.50)	DC	6.	3.53390	(81070324)	AT	(458996.00, 3760343.50)	DC
2.	3.98283	(81070408)	AT	(458896.00, 3760343.50)	DC	7.	3.51569	(81070408)	AT	(458896.00, 3760243.50)	DC
3.	3.85769	(81070408)	AT	(458896.00, 3760443.50)	DC	8.	3.47193	(81070524)	AT	(458996.00, 3760343.50)	DC
4.	3.81981	(81070408)	AT	(458996.00, 3760443.50)	DC	9.	3.43782	(81070408)	AT	(458796.00, 3760343.50)	DC
5.	3.62539	(81070408)	AT	(458996.00, 3760243.50)	DC	10.	3.34949	(81021308)	AT	(458996.00, 3760343.50)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE MAXIMUM 10 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE	RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE
1.	2.33892	(81070524)	AT	(458996.00, 3760343.50)	DC	6.	1.98211	(81070424)	AT	(458996.00, 3760243.50)	DC
2.	2.21381	(81070524)	AT	(458996.00, 3760443.50)	DC	7.	1.94383	(81070524)	AT	(458996.00, 3760143.50)	DC
3.	2.16375	(81070424)	AT	(458996.00, 3760343.50)	DC	8.	1.90109	(81070524)	AT	(459296.00, 3760743.50)	DC
4.	2.15362	(81070524)	AT	(458996.00, 3760243.50)	DC	9.	1.89490	(81070524)	AT	(458896.00, 3760343.50)	DC
5.	2.04804	(81070424)	AT	(458996.00, 3760443.50)	DC	10.	1.87750	(81070424)	AT	(458896.00, 3760243.50)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

1

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE SUMMARY OF MAXIMUM ANNUAL (1 YRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	0.23849 AT	(459496.00, 3757443.50, 268.49, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.22322 AT	(459896.00, 3757343.50, 269.51, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.22289 AT	(459396.00, 3757443.50, 265.37, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.22238 AT	(459596.00, 3757443.50, 265.54, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.22010 AT	(459496.00, 3757543.50, 265.54, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.22000 AT	(459396.00, 3757543.50, 261.03, 0.00)	DC	NA
	7TH HIGHEST VALUE IS	0.21907 AT	(459296.00, 3757543.50, 257.52, 0.00)	DC	NA
	8TH HIGHEST VALUE IS	0.21643 AT	(459596.00, 3757343.50, 268.66, 0.00)	DC	NA
	9TH HIGHEST VALUE IS	0.21101 AT	(459796.00, 3757343.50, 261.85, 0.00)	DC	NA
	10TH HIGHEST VALUE IS	0.21084 AT	(459096.00, 3757603.50, 247.55, 0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

1

```
ISCST3X  PC (32 BIT) VERSION  4.0.0
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Run Began on  8/11/2004 at  7:24:32

** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC02b.dat
** Trinity Consultants


CO STARTING
CO TITLEONE  Riverside ERC
CO TITLETWO  Revised CEC Run #02 (PM Emissions - 24-Hour Only)
CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
CO AVERTIME  1  24
CO POLLUTID  OTHER
CO TERRHGTS  ELEV
CO RUNORNOT  RUN
CO FINISHED

SO STARTING
SO ELEVUNIT  METERS
SO LOCATION  SRC1  POINT  458296.0  3757943.6  222.1992
** SRCDESCR  Turbine #1
SO LOCATION  SRC2  POINT  458296.0  3757980.1  221.8944
** SRCDESCR  Turbine #2
SO LOCATION  SRC3  POINT  458291.0  3757958.0  221.8944
** SRCDESCR  Cooling Tower #1
SO LOCATION  SRC4  POINT  458296.0  3757958.0  221.8944
** SRCDESCR  Cooling Tower #2
SO LOCATION  SRC5  POINT  458301.0  3757958.0  221.8944
** SRCDESCR  Cooling Tower #3
SO LOCATION  SRC6  VOLUME  458233.1  3757951.9  221.8944
** SRCDESCR  ZLD
SO SRCPARAM  SRC1  3.779937E-01  24.384  716.4833  22.02661  3.9624
SO SRCPARAM  SRC2  3.779937E-01  24.384  716.4833  22.02661  3.9624
SO SRCPARAM  SRC3  1.467875E-03  5.57784  305.3722  7.82034  3.9624
SO SRCPARAM  SRC4  1.467875E-03  5.57784  305.3722  7.82034  3.9624
SO SRCPARAM  SRC5  1.467875E-03  5.57784  305.3722  7.820339  3.9624
SO SRCPARAM  SRC6  4.699721E-04  1.2192  0.566928  0.283464
```

Riverside ERC
Revised AQIA Modeling
Turbines, Cooling Tower, ZLD
24-Hour
8/10/04

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE MAXIMUM 10 24-HR AVERAGE CONCENTRATION VALUES FOR SOURCE GROUP: ALL ***
INCLUDING SOURCE(S): SRC1 , SRC2 , SRC3 , SRC4 , SRC5 , SRC6 ,

** CONC OF OTHER IN MICROGRAMS/M**3 **

RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE	RANK	CONC	(YYMMDDHH)	AT	RECEPTOR (XR,YR)	OF TYPE
1.	1.78406	(81070524)	AT	(458996.00, 3760343.50)	DC	6.	1.51661	(81070424)	AT	(458996.00, 3760243.50)	DC
2.	1.68839	(81070524)	AT	(458996.00, 3760443.50)	DC	7.	1.49229	(81070524)	AT	(458996.00, 3760143.50)	DC
3.	1.65134	(81070424)	AT	(458996.00, 3760343.50)	DC	8.	1.45170	(81070524)	AT	(459296.00, 3760743.50)	DC
4.	1.64724	(81070524)	AT	(458996.00, 3760243.50)	DC	9.	1.44613	(81070524)	AT	(458896.00, 3760343.50)	DC
5.	1.56293	(81070424)	AT	(458996.00, 3760443.50)	DC	10.	1.43722	(81070424)	AT	(458896.00, 3760243.50)	DC

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

Riverside ERC
Revised AQIA Modeling
Turbines, Cooling Tower, ZLD
Annual
8/10/04


```
                    ISCST3 - (DATED 02035)

            ISCST3X  PC (32 BIT) VERSION  4.0.0
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 Run Began on  8/11/2004 at  7:46:41

 ** BREEZE ISC GIS Pro v4.0.7 - C:\BREEZE\RiversideCEC03b.dat
 ** Trinity Consultants


 CO STARTING
 CO TITLEONE  Riverside ERC
 CO TITLETWO  Revised CEC Run #03 (PM Emissions - Annual Only)
 CO MODELOPT  CONC  URBAN  NOCALM  HE>ZI
 CO AVERTIME  ANNUAL
 CO POLLUTID  OTHER
 CO TERRHGTS  ELEV
 CO RUNORNOT  RUN
 CO FINISHED

 SO STARTING
 SO ELEVUNIT  METERS
 SO LOCATION  SRC1  POINT  458296.0  3757943.6  222.1992
 ** SRCDESCR  Turbine #1
 SO LOCATION  SRC2  POINT  458296.0  3757980.1  221.8944
 ** SRCDESCR  Turbine #2
 SO LOCATION  SRC3  POINT  458291.0  3757958.0  221.8944
 ** SRCDESCR  Cooling Tower #1
 SO LOCATION  SRC4  POINT  458296.0  3757958.0  221.8944
 ** SRCDESCR  Cooling Tower #2
 SO LOCATION  SRC5  POINT  458301.0  3757958.0  221.8944
 ** SRCDESCR  Cooling Tower #3
 SO LOCATION  SRC6  VOLUME  458233.1  3757951.9  221.8944
 ** SRCDESCR  ZLD
 SO SRCPARAM  SRC1  5.669905E-02  24.384  716.4833  22.02661  3.9624
 SO SRCPARAM  SRC2  5.669905E-02  24.384  716.4833  22.02661  3.9624
 SO SRCPARAM  SRC3  4.460325E-04  5.57784  305.3722  7.820339  3.9624
 SO SRCPARAM  SRC4  4.460325E-04  5.57784  305.3722  7.820339  3.9624
 SO SRCPARAM  SRC5  4.460325E-04  5.57784  305.3722  7.820339  3.9624
 SO SRCPARAM  SRC6  1.259979E-04  1.2192  0.566928  0.283464
```

**MODELOPTs:
CONC URBAN ELEV NOCALM HE>ZI

*** THE SUMMARY OF MAXIMUM ANNUAL (1 YRS) RESULTS ***

** CONC OF OTHER IN MICROGRAMS/M**3 **

GROUP ID		AVERAGE CONC	RECEPTOR (XR, YR, ZELEV, ZFLAG)	OF TYPE	NETWORK GRID-ID
ALL	1ST HIGHEST VALUE IS	0.07789 AT	(458360.00, 3757935.75, 229.70, 0.00)	DC	NA
	2ND HIGHEST VALUE IS	0.05795 AT	(458376.00, 3757933.50, 230.48, 0.00)	DC	NA
	3RD HIGHEST VALUE IS	0.05083 AT	(458188.09, 3757941.00, 229.22, 0.00)	DC	NA
	4TH HIGHEST VALUE IS	0.04191 AT	(458376.00, 3757903.50, 230.48, 0.00)	DC	NA
	5TH HIGHEST VALUE IS	0.04184 AT	(458360.00, 3757905.75, 230.00, 0.00)	DC	NA
	6TH HIGHEST VALUE IS	0.03878 AT	(458406.00, 3757903.50, 231.48, 0.00)	DC	NA
	7TH HIGHEST VALUE IS	0.03565 AT	(458406.00, 3757933.50, 231.48, 0.00)	DC	NA
	8TH HIGHEST VALUE IS	0.03539 AT	(458188.09, 3757971.00, 229.15, 0.00)	DC	NA
	9TH HIGHEST VALUE IS	0.03137 AT	(458436.00, 3757903.50, 232.00, 0.00)	DC	NA
	10TH HIGHEST VALUE IS	0.03023 AT	(459496.00, 3757443.50, 268.49, 0.00)	DC	NA

*** RECEPTOR TYPES: GC = GRIDCART
GP = GRIDPOLR
DC = DISCCART
DP = DISCPOLR
BD = BOUNDARY

Cooling Tower Emissions Summary

Riverside ERC
Revised August 10, 2004

Equipment Information:

Equipment Type: Cooling Tower	Capacity (tons): 3,140	Water Flow Per Cell (gpm): 1,863
Manufacturer: Evapco	Air Flow Per Cell (acfm) 204,333	Drift Rate (%): 0.001
Model: 314-0772	# of Cells: 3	TDS Level (ppm): 1250
	Annual Operating Schedule: 1330	

Emission Rates (for modeling):

Pollutant	Per Cell Emission Rate (lbs/hr)	Total Emission Rate (lbs/hr)	Total Emission Rate (g/s)		Comments
PM_{10}	0.01165	0.0350	0.00441	24-Hour	
PM_{10}	0.00177	0.0053	0.00067	Annual	annual emissions averaged over 8760 hours
$PM_{2.5}$	0.01165	0.0350	0.00441	24-Hour	
$PM_{2.5}$	0.00177	0.0053	0.00067	Annual	annual emissions averaged over 8760 hours

Daily Emissions (24 hour day) **Annual Emissions (Equiv. 1330 hours 100% load, 25 concentration cycles)**

	Total Emission Rate (lbs/day)	Total Emission Rate (lbs/year)
PM_{10}	0.839	46.5
$PM_{2.5}$	0.839	46.5

Notes:
1. Total cooling tower flow rate: (613,000 acfm).
2. Total cooling tower circulation rate: 5590 (gpm).
3. Actual cooling tower emission rates were used in the air dispersion model.
4. Cooling tower TDS = Raw water TDS x concentration Cycles = 50 ppm x 25 cycles

Riverside Energy Center
Filter Cake Loading Emissions
9-Aug-04

On-Site Fugitive Emissions from Filter Cake Loading

$E = [0.00112 \times ([(G/5)^{1.3}]/[(H/2)^{1.4}])] \times [I/J]$

E = PM_{10} Emissions from dirt loading/handling
G = Mean wind speed in miles per hour
H = Moisture content of surface material
I = Pounds of cake loaded
J = 2,000; convert lbs of dirt to tons of dirt

	m/s	mph
	1.73	3.87

	G (Mean wind speed mph)	H (Moisture content %)	I (Lbs of cake handled / hour)	I (Lbs of cake handled / day - 24 hours)	I lbs of cake loaded per year - 1330 hours at 100% rate	Hourly PM_{10} Emissions (lbs)	Daily PM_{10} Emissions (lbs)	Project PM_{10} Emissions (lbs)
	3.87	10	140	3,360	186,200	0.00373	0.089	4.95
Source:	*Met Data annual average*	*mfr estimate of cake composition*	*Mfr estimate*					

Filter cake will go from the filterpress to a container.
Container will be covered when transported.

References: Section 2.0 Aquatech estimated composition of salt cake.

Prepared Testimony
Of
Jeffrey J. Johnston

1. Q. Please state your name and employer.
   A. My name is Jeffrey J. Johnston and I am Chief Engineering Geologist for LOR Geotechnical Group Inc.

2. Q. What are your responsibilities with regard to the Riverside Energy Resource Center?
   A. LOR Geotechnical Group has been retained to provide the preliminary engineering geology and soils investigation to evaluate the geological/soils conditions of the site relative to the proposed development.

   Specifically our tasks include studies to collect and analysis data regarding the nature, distribution and strength of the existing soils and geologic materials and provided conclusions and recommendations for grading procedures and design criteria for corrective measures and an opinion on the adequacy for the intended use of the site as affected by the geologic/soils factors.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

Exh 1	Section 6.5	Geologic Resources and Hazards
Exh 2	Response 43-45, 49-51 and 55	
Exh 3	Response 0.34 to 1.9 minutes/inch permeability	

4. Q. Do you have any comments on the silt content of the soil?
   A. Samples taken at the site during our studies and tested for silt content in our laboratories have indicated silt contents that ranged from 2.4 to 15.5 %.

5. Q. CEC Staff analyzes the site storm water drainage in its Final Initial Study at page 10-11. Do you have any comments on this subject?
   A. No.

6. Q. Does that complete your direct testimony?
   A. Yes, it does.

Prepared Direct Testimony
Of
Brian Arnold

1. Q. Please state your name and your employer.
   A. My name is Brian Arnold and I am Program Director – Natural Resources in SWCA Environmental Consultant's San Diego office.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center?
   A. SWCA has been retained to evaluate the potential impacts upon biological resources in the vicinity of the project and its linear facilities, resulting from project construction and operation.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. I am sponsoring the following:

Exh 1	Section 6.3	Biological Resources
	Section 6.3	Appendix A Plant Species
		Appendix B Wildlife Species
Exh 2	Responses 21, 22 and 24	
Exh 3	Response on MSHCP	

4. Q. CEC Staff, in its Final Initial Study at pages 5-6 and 5-7 discusses the project's impacts on biological resources. Do you have any comments on that discussion?

   I concur with the CEC Staff's evaluation of impacts to biological resources as a result of construction and operation of the proposed project presented in the Final Initial Study.

5. Q. Does that complete your direct testimony?
   A. Yes, it does.

Prepared Direct Testimony
Of
Keith Waller

1. Q. Please state your name and employer.
   A. My name is Keith Waller and I am a Discipline Lead Civil Engineer employed by Power Engineers.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center?
   A. I am responsible for providing preliminary design in the areas of grading and drainage, storm water collection system, erosion and sedimentation control, and location of underground utility interfaces at the site and the linear facilities.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

Exh 1	Section 6.13.6.3	Storm Water System
	Section 6.13.7.2	Project Effect on Wind or Water Erosion and Sedimentation
	Section 6.13.7.3	Project Effect on Water Quality Degradation
	Section 6.13.7.4	Flooding Potential
Exh 2	Responses 53-56	
Exh 3	Response on selection of 0.3 runoff coefficient	
Exh 9	Responses 47-50	

4. Q. The CEC Staff Final Initial Study, at page 10-14 contains a discussion of the proper runoff coefficient and the impacts of a 50-year storm. Do you have any comments on this discussion?
   A. Yes. I concur with the Staff response to the issues raised regarding the runoff coefficients utilized in preparing the preliminary design. The Staff indicated that they compared the runoff coefficients used in the preliminary design with the NRCS Hydraulic Design Manual and the Caltrans Highway Design Manual and found them to be appropriate numbers.

   I also concur with the Staff response to the issues raised regarding the 50-year storm to establish a preliminary size for the storm water detention basin and the conveyance system piping. As the Staff indicated, the Santa Ana Regional Water Quality Control Board does not have a regulation regarding the size of the storm event to be used in determining peak flow.

Use of the 50-year storm is appropriate because municipal storm water conveyance systems are rarely designed for a storm event greater than the 50-year occurrence, so designing a feeder system with greater capacity than the receiving system would not be practical.

The Staff also was correct in their assumption that by using the volume of the 50-year one hour storm (1.1 inches) to size the basin that we were actually being conservative based on requirements common to the region. LA County SUSMP regulations require the first ¾-inch of rain from any storm event be contained onsite. We used 1.1 inches of rain and have estimated a size that is conservative relative to LA County requirements.

5. Q. Does that complete your direct testimony?
A. Yes, it does.

Prepared Direct Testimony
Of
David Clark

1. Q. Please state your name and employer.
   A. My name is David Clark and I am a Principal with Economic Planning Resources.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center.
   A. Economic Planning Resources was retained by Power Engineers to perform socioeconomic studies with regard to the RERC.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

   Exh 1 6.12 Socioeconomic Resources

4. Q. In Staff's Final Initial Study at page 14-6 there is a discussion of Minority and Low-income Populations. Do you have any comment on that discussion?
   A. Yes I do. The plant site itself is located within Census Tract 309. In Census Tract 309 there were 3, 070 people as of April 1, 2000, 1,630 of whom were defined as a one race, white for a total of 53.1 percent. The remaining population was 1,440, or 46.9 percent. This contrasts with the region I considered as all areas within 6 miles of the plant and transmission line, where a single race, white population was 59.5 percent of the total population of 495,081, with all other reporters comprising 40.5 percent of the total.

   I conducted my analysis solely at the Census Tract level. However, the CEC analysis addressed the Census Block and Census Block Group level, which are subsets of Census Tracts. The plant itself lies within Census Block Group 1006, a subset of Census Tract 309. The Census data reveal that there were no residents of Census Block Group 1006 as of April 1, 2000. In adjacent Census Block Group 1022, there were two residents reported, both of whom are listed as minority (meaning any reporting status other than one race white.

5. Q. Does that complete your direct testimony?
   A. Yes, it does.

Prepared Direct Testimony
Of
John Baker

1. Q. Please state your name and employer.
   A. My name is John Baker and I am employed by POWER Engineers, Inc. as a mechanical engineer.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center?
   A. My role is Project Engineer. My duties and responsibilities include overseeing the preliminary engineering performed by POWER Engineers, assisting the Project Manager in his duties, and overseeing the review of the detailed design effort.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

Exh 1	Section 2.5	Process Description
	Section 2.6	Fuel System
	Section 2.7	Water Supply and Use
	Section 2.8	Wastewater
	Section 2.10	Plant Auxiliaries
	Section 2.11	Electrical System
	Section 2.13	Plant Controls
	Section 3	Energy Efficiency
	Section 6.13.5	Water Resources (Water Supply)
	Appendix 6.1-A	Equipment Information
Exh 2	Responses 38, 51, 52, 56, 57, and 61	
Exh 3	Responses on ZLD description, location of reclaimed water line and thermal plume	
Exh 6	Responses 8.a-8.c	
Exh 11	Response to Cure Data Request Set #4 (#77 only).	

4. Q. CEC Staff in its Final Initial Study, Table 15 at page 4-27, discusses emissions from the zero liquid discharge system and the project's cooling towers. Do you have any comments on that discussion?
   A. We have continued to refine the project design for a Zero Liquid Discharge system. We are planning on using an integrated demineralized

water/ZLD system that takes wastewater and produces demineralized water for plant use and a filter cake or slurry for disposal. Our current design is to use the 1st stage effluent from the demineralized water system for make-up to the cooling tower. This will result in lower TDS water being supplied to the cooling tower, and as a result, less PM10 emissions from the tower. With this approach PM10 emissions have been reduced.

On August 2, we submitted cooling tower emissions calculations based upon pre-treated intake water with a TDS content of 10.2 ppm. We have since learned that while the lower intake concentration can be achieved, it may also have a detrimental impact on cooling tower durability. We have since recalculated cooling tower emissions based upon an inlet concentration of 50 ppm and 25 concentration cycles, or a maximum concentration of 1250 ppm in the cooling tower water on an annual basis (50 TDS intake ppm x 25 concentration cycles). The optimal cooling tower management strategy for this facility includes an inlet water TDS concentration of 50 ppm and 15 cycles of concentration, which would result in lower air emissions than at 25 cycles. As the cycles of concentration rise above 15 and blow down decreases, a point is reached where the blow down flows are so low that they cannot be controlled. If cycles of concentration rise above this point, blow down flows are so low that a continuous blow down cannot be maintained and an intermittent blow down (batch process) would have to be used. This type of operation is highly undesirable due to fluctuations in cooling tower water levels, water chemistry, and inconsistent demand on the makeup system. Therefore maintaining at least some minimum amount of blow down is desired.

5. Q. CEC Staff in its Final Initial Study at page 10-15 discusses the design of the storm water runoff from the site. Do you have any comments on that discussion?

A. The construction of the RERC will add equipment, buildings, pavement, etc. that may decrease (from the existing undeveloped condition) the project site's ability to infiltrate water. As a result, the plan is to contain this additional amount of rainwater that may not be infiltrating (due to buildings, pavement, etc.). This additional rainwater will be contained in a retention/infiltration basin sized to contain the full volume of this additional rainwater during a 50 year storm event over a duration of 1 hour. In addition, the basin will allow infiltration of the rainwater into the surrounding soil. In the rare case that the rainfall exceeds the 50 year storm over 1 hour, the retention/infiltration basin will overflow into an existing storm sewer at the City of Riverside Water Quality Control Plant (WQCP) just west of the project site. WCQP personnel have confirmed that during some storm events, storm water currently flows from the

project site (in its existing undeveloped state) into the WQCP stormwater system and is processed by the WQCP.

By developing the site and building the RERC project, the amount of rainwater that falls onto the site remains unchanged. Since the project will be collecting and retaining/infiltrating a significant portion of this unchanged amount of rainwater (in storm events equal to or smaller than a 50 year storm for a duration of 1 hour) the new RERC stormwater system will likely decrease the load on the City's WQCP. During storm events greater than the 50 year 1 hour event, some water will overflow into the WQCP system, but it will still be less than they currently experience at the WQCP since currently the rainwater that falls onto the site, that does not infiltrate, flows to the WQCP. Even if it is argued that the RERC will increase stormwater flows to the WQCP stormwater system, WQCP personnel have confirmed that they have significant capacity in that system and an increase would not be a concern.

6. Q. CEC Staff also discusses the size of the infiltration basin at page 10-7 and 10-15 of its Final Initial Study. Do you have any comments on that discussion?

A. In addition to the testimony presented in item 5 above, I offer the following additional comments. The 50 year storm event and 1 hour duration were selected based upon Standard Urban Storm Water Mitigation Plan (SUSMP) requirements for LA County. The LA County SUSMP requirements were selected as a guideline in preparing a preliminary estimate of the size of the retention basin because the Santa Ana Regional Water Quality Board does not have a requirement for the recurrence interval to use in determining peak flows. The LA County SUSMP requirements were also used because they are generally more stringent than other neighboring counties and we wanted to come up with a conservative estimate of the size of the retention basin.

The LA County SUSMP regulations require that the first ¾ inch of water from any storm event be contained onsite prior to discharge. The 50 year one hour storm event was selected for sizing the retention basin for this site because the value is 1.1 inches of water, which is greater than (and therefore more conservative) the LA County requirements. The 50 year storm event was also selected for determination of peak flow because it is a typical recurrence interval used in the sizing of municipal storm water systems. From our experience, it is very rare that municipalities would require a recurrence interval in excess of the 50 year storm for design of storm water piping and appurtenances.

7. Q. CEC Staff mentions a 50% failure rate for infiltration basins at page 10-15 of its Final Initial Study. Do you have any comments?

A. We do not know the source of the quoted 50% failure rate that CURE has referred to and have not seen the data used in determining the 50%. "Failure" implies that in a short duration the equipment goes from working properly to not working at all. The performance of the retention/infiltration basin may decline over a long period of time, but it will not experience a sudden "failure" as described above. The open bottomed retention/infiltration basin will sit on a layer of drain rock wrapped in geotextile separation fabric. Over time the pore spaces in the drain rock may become filled with silt to a degree that the infiltration rate slows down to an unacceptable level. At this time, the drain rock and geotextile fabric may need to be cleaned and/or replaced. The basin will require periodic routine maintenance and cleaning just like any other piece of equipment on site.

8. Q. Does that complete your direct testimony?
A. Yes, it does.

Prepared Direct Testimony
Of
Steve Badgett

1. Q. Please state your name and employer.
   A. My name is Stephen H. Badgett and I am the Assistant Director for Energy Delivery City of Riverside Public Utilities.

2. Q. What are your duties and responsibilities in that position?
   A. I am responsible for the engineering, construction, maintenance, and operation of the City's electric, street light and tele-communication delivery systems serving the City's 100,000+ customers

3. Q. What are your responsibilities with regard to the Riverside Energy Resource Center?
   A. The Energy Delivery Division is charged with conceptual, design, engineering, and construction of the project. This task is the result of review and study by Management's (of which I am a part of) and other outside consultation of future load requirements and the availability of resources to meet those loads. That Management Team recommended the development of the RERC.

4. Q. Have you reviewed the California Energy Commission Staff Initial Study?
   A. Not in detail, but enough to observe that the Staff did a very good job describing the project and recommending conditions of certification that we can accept.

5. Q. On behalf of the City of Riverside, do you accept the Conditions of Certification in the Initial Study?
   A. Yes, I do, on behalf of the City.

6. Q. Does that complete your direct testimony?
   A. Yes, it does.

Prepared Direct Testimony
Of
Dan McCann

1. Q. Please state your name and employer.
   A. My name is Dan McCann and I am employed by the City of Riverside Public Utilities Department as Power Resource Scheduling/Operations Manager.

2. Q. What are your duties and responsibilities with regard to the Riverside Energy Resource Center?
   A. I am responsible for the managing the City owned generation, contract resources and short term purchases to meet the city customer requirements. I also manage the operations, maintenance and repair of city owned resources.

3. Q. Are you sponsoring any exhibits in this proceeding?
   A. Yes, I am sponsoring the following:

Exh 1	Section 2.3	Alternate Sites
	Section 7	Alternatives Considered
Exh 2	Responses 1, 16 and expansion of substations	
Exh 6	Responses 3.a-3.e and 4.a-4.c	

4. Q. The CEC Staff Final Initial Study discusses boulder removal from the site (page 4-25). Do you have any comments on boulder removal?
   A. There will be no dust from drilling of the rocks and there will be very little noise from the drilling. For the blasting, the noise will be below 80 decibels at 100 feet. There will be three blasts for the three boulders. The blasting produces very little dust.

5. Q. Does that complete your direct testimony?
   A. Yes, it does.