APPENDIX D

GENERATING STATION CONSTRUCTION EMISSIONS

- **Daily Maximum Construction Emissions**
- **Project Off-Site Construction Emissions**
- **Daily Maximum Onsite Construction Emissions**
- **Construction Equipment Use**
- **Combustion Equipment Operating Schedule**
- **Fugitive Construction Emissions**

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

	NOx	CO	VOC	SOx	PM10
Onsite Emissions	60.30	30.49	5.60	0.06	17.23
Onroad Emissions	20.16	59.90	6.55	0.18	119.16
Transmission Line	15.13	12.20	1.81	0.02	1.07
Total Max. Pounds per Day	**96**	**103**	**14**	**0.3**	**137**

*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	5445	3879	695	6	1097
Onroad Emissions	2855	6959	773	26	18339
Transmission Line	780	562	88	1	54
Total Pounds per Project	9081	11400	1556	32	19490
Total Tons per Project	**4.5**	**5.7**	**0.8**	**0.02**	**9.7**

*Onroad PM10 emissions include tire and brake wear.

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

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	60.30	30.49	5.60	0.06	3.89
Unpaved Road Travel Fugitive PM Emisssions					1.50
Grading / Bulldozing Fugitive PM Emissions					9.94
Earth Loading Fugitive PM Emissions					1.81
Disturbed Soil Wind Erosion PM Emissions					0.09
Total Max. Pounds per Day	**60.3**	**30.5**	**5.6**	**0.1**	**17.2**

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

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	5445	3879	695	6	426
Unpaved Road Travel Fugitive PM Emisssions					181
Grading / Bulldozing Fugitive PM Emissions					395
Earth Loading Fugitive PM Emissions					81
Disturbed Soil Wind Erosion PM Emissions					14
Total Pounds per Project	**5445**	**3879**	**695**	**6**	**1097**
Total Tons per Project	**2.7**	**1.9**	**0.3**	**0.0**	**0.5**

Construction Emissions
Defined Volume and Area Sources

Source Identification	Description
Volume Source #1	Combustion emissions near turbine pads
Volume Source #2	Combustion emissions near compressor, NH3 tank, etc.
Volume Source #3	Combustion emissions near station
Volume Source #4	Combustion emissions near admin. Building
Volume Source #5	Earthmoving PM emissions near turbine pads
Volume Source #6	Earthmoving emissions near compressor, NH3 tank, etc.
Volume Source #7	Earthmoving emissions near station
Volume Source #8	Earthmoving emissions near admin. Building
Area Source #1	Wind erosion

PM10 Lb/hr - Daily High

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8	Total
	0.1216	0.1946	0.0973	0.0730	0.0000	0.0000	0.0000	0.0000	0.4864
					0.0467	0.0654	0.0374	0.0374	0.1869
					0.2485	0.4971	0.2485	0.2485	1.2427
0.0036					0.0905	0.0452	0.0452	0.0452	0.2262
									0.0036

Emission Allocation Percentage

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8
	25%	40%	20%	15%				
					25%	35%	20%	20%
					20%	40%	20%	20%
100%					40%	20%	20%	20%

PM10 Lb/hr - Daily High

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8
	0.1216	0.1946	0.0973	0.0730	0.0000	0.0000	0.0000	0.0000
					0.0467	0.0654	0.0374	0.0374
					0.2485	0.4971	0.2485	0.2485
					0.0905	0.0452	0.0452	0.0452
0.0036								

PM10 Lb/hr - Annual Average

Area 1	Volume 1	Volume 2	Volume 3	Volume 4	Volume 5	Volume 6	Volume 7	Volume 8
	0.0122	0.0194	0.0097	0.0073				
					0.0052	0.0072	0.0041	0.0041
					0.0090	0.0180	0.0090	0.0090
					0.0037	0.0019	0.0019	0.0019
0.0016								

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

	NOx	CO	VOC	SOx	PM10
Passenger Vehicle - Combustion Emissions*	6.48	58.86	6.12	0.04	0.29
Delivery Truck Combustion Emissions*	13.68	1.04	0.43	0.14	0.28
Passenger Vehicle - Paved Road Dust					7.69
Delivery Truck - Paved Road Dust					110.90
Transmission Line Construction	15.13	12.20	1.81	0.02	1.07
Total Max. Pounds per Day	35.3	72.1	8.4	0.2	120.2

*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	748	6798	707	22	44
Delivery Truck Combustion Emissions	2107	161	67	4	33
Passenger Vehicle - Paved Road Dust					1184
Delivery Truck - Paved Road Dust					17078
Transmission Line Construction	780	562	88	1	54
Total Pounds per Project	3635	7521	861	27	18393
Total Tons per Project	1.8	3.8	0.4	0.0	9.2

*PM10 emissions include tire and brake wear.

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)	0.0029	0.0012	0.038	0.00039	0.0007	0.00009
Offsite (Construction Worker Vehicle)	0.01635	0.0017	0.0018	0.00001	0.000035	0.000045

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

Pasenger vehicle emission rates reflect 50% light duty passenger cars and 50% light duty tructs.

Construction Vehicle Number of Onroad Trips and Trip Length

Vehicle	No. of One-Way Trips/Day	No. of One-Way Trips/Project	One WayTrip Length (miles)
Offsite (Heavy Duty Trucks) 12 haul trips/day earthmoving phase,	12	1848	15
Offsite (Construction Worker) 22 day/mo., 7 mo. 75% project adjustment	60	6930	30

Onroad Emissions - Daily Max.

	CO	VOC	NOx	SOx	PM10 Exh.	PM10 - tire/break	Total PM10
Offsite (Heavy Duty Trucks - Diesel)	1.0	0.4	13.7	0.1	0.3	0.0	0.3
Offsite (Construction Worker Vehicle)	58.9	6.1	6.5	0.0	0.1	0.2	0.3
Total Daily Onroad Emissions (lb/day)	59.9	6.6	20.2	0.2	0.4	0.2	0.6

Onroad Emissions - Project Totals

	CO	VOC	NOx	SOx	PM10 Exh.	PM10 - tire/break	Total PM10
Offsite (Heavy Duty Trucks - Diesel)	161	67	2107	22	39	5	44
Offsite (Construction Worker Vehicle)	6798	707	748	4	15	19	33
Total Daily Onroad Emissions (lb/project)	6959	773	2855	26	53	24	77

Title : South Coast AQMD Avg 2004 Winter Default Title
Version : Emfac2002 V2.2 Apr 23 2003
Run Date : 03/29/04 22:58:14
Scen Year: 2004 -- Model Years: 1965 to 2004
Season : Winter
Area : South Coast AQMD Average
I/M Stat : I and M program in effect
Emissions: Tons Per Day

All Vehicles	Light Duty Passenger Cars: Non-cat	Cat	Diesel	Total	Light Duty Trucks: Non-cat	Cat	Diesel	Total	Medium Duty Trucks: Non-cat	Cat	Diesel	Total	Heavy Duty Trucks — Gasoline Trucks: Non-cat	Cat	Total	Diesel Trucks	Total HD Trucks	Urban Buses	Motor-cycles
Reactive Organic Gas Emissions																			
Vehicles 9704910.	137452.	5591220.	29575.	5758240.	74168.	2659270.	35856.	2769290.	16653.	686636.	42820.	746110.	19370.	116897.	136267.	149910.	286177.	11269.	133818.
VMT/1000 341245.	2309.	194614.	740.	197662.	1762.	94133.	1253.	97148.	344.	25337.	2089.	27770.	213.	2737.	2949.	13522.	16472.	1242.	952.
Trips 65257600.	597242.	35292800.	171006.	36061000.	331184.	16842900.	225560.	17399600.	187073.	6804450.	426507.	7418030.	281166.	1470730.	1751900.	2314360.	4066260.	45075.	267610.
Run Exh 97.27	13.89	29.33	0.23	43.45	10.43	16.33	0.17	26.93	2.14	5.93	0.43	8.50	1.21	3.29	4.50	7.57	12.07	2.74	3.58
Idle Exh 0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.13	0.00	0.14	0.01	0.06	0.08	0.61	0.69	0.00	0.00
Start Ex 73.97	3.26	35.18	0.00	38.44	1.71	16.84	0.00	18.55	1.28	7.61	0.00	8.89	3.43	3.77	7.21	0.00	7.21	0.12	0.77
Total Ex 172.07	17.15	64.51	0.23	81.88	12.14	33.16	0.17	45.48	3.42	13.68	0.44	17.54	4.66	7.12	11.78	8.18	19.96	2.86	4.35
Diurnal 15.61	1.11	8.67	0.00	9.78	0.58	3.79	0.00	4.37	0.07	0.93	0.00	1.00	0.02	0.04	0.06	0.00	0.06	0.00	0.40
Hot Soak 21.53	2.69	10.21	0.00	12.90	1.50	4.48	0.00	5.98	0.33	1.52	0.00	1.85	0.21	0.25	0.46	0.00	0.46	0.02	0.32
Running 101.79	12.88	41.88	0.00	54.76	4.12	25.17	0.00	29.30	1.38	9.85	0.00	11.23	1.40	3.40	4.80	0.00	4.80	0.10	1.60
Resting 5.55	0.50	2.94	0.00	3.45	0.27	1.32	0.00	1.59	0.03	0.33	0.00	0.36	0.00	0.01	0.01	0.00	0.01	0.00	0.14
Total 316.56	34.33	128.22	0.23	162.77	18.62	67.93	0.17	86.72	5.24	26.30	0.44	31.98	6.28	10.84	17.12	8.18	25.30	2.98	6.81
Carbon Monoxide Emissions																			
Run Exh 2093.99	172.32	850.79	0.65	1023.76	130.25	548.81	0.82	679.89	35.97	141.53	1.50	179.00	36.21	69.01	105.22	35.69	140.91	23.81	46.62
Idle Exh 4.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.80	0.02	0.86	0.09	0.39	0.48	3.65	4.12	0.00	0.00
Start Ex 794.09	19.41	369.60	0.00	389.02	10.69	204.35	0.00	215.04	8.85	85.69	0.00	94.54	31.53	59.55	91.08	0.00	91.09	1.64	2.77
Total Ex 2893.06	191.73	1220.39	0.65	1412.77	140.94	753.16	0.82	894.93	44.85	228.03	1.53	274.40	67.83	128.95	196.78	39.34	236.11	25.45	49.40
Oxides of Nitrogen Emissions																			
Run Exh 556.23	12.27	105.58	1.18	119.03	9.09	79.85	1.92	90.86	2.25	31.30	12.69	46.25	1.33	20.22	21.55	255.87	277.42	21.17	1.51
Idle Exh 11.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.09	0.00	0.00	0.01	11.19	11.19	0.00	0.00

Start Ex	0.92	21.78	0.00	22.70	0.49	14.11	0.00	14.60	0.22	8.91	0.00	9.13	0.52	7.64	8.16	0.00	8.16	0.14	0.09
54.83																			
Total Ex	13.19	127.36	1.18	141.73	9.59	93.96	1.92	105.46	2.47	40.22	12.77	55.46	1.85	27.87	29.72	267.05	296.77	21.31	1.60
622.34				.0014				0.0022								0.0380			
Carbon Dioxide Emissions (000)																			
Run Exh	1.25	78.38	0.30	79.93	0.95	45.64	0.48	47.07	0.21	16.94	1.08	18.23	0.14	1.73	1.87	29.20	31.07	2.56	0.12
178.99																			
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03	0.00	0.01	0.02	0.57	0.58	0.00	0.00
0.61																			
Start Ex	0.13	2.93	0.00	3.06	0.07	1.68	0.00	1.75	0.04	0.64	0.00	0.69	0.06	0.06	0.12	0.00	0.12	0.00	0.02
5.64																			
Total Ex	1.38	81.31	0.30	82.99	1.02	47.32	0.48	48.83	0.26	17.61	1.09	18.95	0.20	1.80	2.00	29.77	31.78	2.57	0.14
185.24																			
PM10 Emissions																			
Run Exh	0.08	2.29	0.14	2.50	0.06	1.66	0.09	1.81	0.01	0.51	0.11	0.63	0.00	0.02	0.03	4.36	4.38	0.32	0.04
9.69																			
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.28	0.00	0.00
0.28																			
Start Ex	0.01	0.26	0.00	0.26	0.00	0.17	0.00	0.18	0.00	0.06	0.00	0.06	0.00	0.01	0.01	0.00	0.01	0.00	0.01
0.52																			
Total Ex	0.09	2.54	0.14	2.77	0.07	1.83	0.09	1.99	0.01	0.57	0.11	0.69	0.01	0.03	0.04	4.64	4.67	0.32	0.05
10.49				0.00003				0.00004								0.0007			
TireWear	0.02	1.72	0.01	1.74	0.02	0.83	0.01	0.86	0.00	0.24	0.02	0.27	0.00	0.04	0.04	0.43	0.46	0.01	0.00
3.35																			
BrakeWr	0.03	2.69	0.01	2.73	0.02	1.30	0.02	1.34	0.00	0.35	0.03	0.38	0.00	0.04	0.04	0.19	0.23	0.02	0.01
4.72				.00004				0.00005								0.00009			
Total	0.14	6.95	0.15	7.25	0.11	3.96	0.12	4.19	0.02	1.16	0.17	1.35	0.01	0.10	0.11	5.25	5.37	0.35	0.07
18.56																			
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
0.00																			
SOx	0.02	0.80	0.02	0.84	0.01	0.47	0.04	0.52	0.00	0.17	0.09	0.27	0.00	0.02	0.02	2.47	2.49	0.18	0.00
4.30																			
Fuel Consumption (000 gallons)																			
Gasoline	177.36	8544.29	0.00	8721.66	131.33	4977.78	0.00	5109.11	34.47	1844.09	0.00	1878.56	33.02	207.76	240.78	0.00	240.78	51.98	23.21
16025.30																			
Diesel	0.00	0.00	26.98	26.98	0.00	0.00	43.31	43.31	0.00	0.00	97.95	97.95	0.00	0.00	0.00	2679.56	2679.56	188.96	0.00
3036.75																			

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

	NOx	CO	VOC	SOx	PM10
Construction Equipment Combustion Emissions	60.30	30.49	5.60	0.06	3.89
Unpaved Road Travel Fugitive PM Emisssions					1.50
Grading / Bulldozing Fugitive PM Emissions					9.94
Earth Loading Fugitive PM Emissions					1.81
Disturbed Soil Wind Erosion PM Emissions					0.09
Total Max. Pounds per Day	**60.3**	**30.5**	**5.6**	**0.1**	**17.2**

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Project On-site Construction Emissions
(lbs/project)

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Grading / Bulldozing Fugitive PM Emissions					395
Earth Loading Fugitive PM Emissions					81
Disturbed Soil Wind Erosion PM Emissions					14
Total Pounds per Project	**5445**	**3879**	**695**	**6**	**1097**
Total Tons per Project	**2.7**	**1.9**	**0.3**	**0.0**	**0.5**

Constructiuon Equipment
Summary of Typical Weights

Equipment	Number of Units	Manufacturer	Model	Vehicle Weight (ton)	Number of Wheels	Source
Truck Crane - Greater than 300 ton	1	Link-Belt	HC-278H II	84.4	12	www.linkbelt.com
Crane - Mobile 65 ton	1	Terex	T-50	35.5	12	www.terex.com
Bulldozer Cat 814F	1	Caterpillar	814F	23.9	4	www.caterpillar.com
Excavator - Trencher	1	Trencor	780HD	40.0	2	www.trencor.com
Excavator - Motor Grader	1	Komatsu	GD655-3	16.3	6	www.komatsu.com
Excavator - Backhoe/loader	2	Terex	820	7.9	4	www.terex.com
Excavator - loader	1	Terex	SKL873 SP	14.6	4	www.terex.com
Truck - Water	1	Freightliner	M2	29.0	6	Quinn Rentals (562)572-0970
Forklift	1	Harlo	H8000	8.0	4	www.kellytractor.com
Dump Truck	2	Liebherr	B30D	22.7	6	www.liebherr.com
Service Truck - 1 ton	2			4.0	4	CEQA Table A9-9-D-3
Concrete Pumper Truck	1			10.0	10	CEQA Table A9-9-D-3
Tractor Truck 5th Wheel	1			27.0	18	CEQA Table A9-9-D-3
Passenger Vehicles				2.0	4	CEQA Table A9-9-D-3
Heavy Duty Delivery Truck				13.3	6	CEQA Table A9-9-D-3

Monthly Site Construction Equipment Use
Riverside Energy Resource Center Project

Equipment	Gasoline/ Diesel	Number of Units	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	4	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 D6H	D	1	8	5.50	44.00	10	440	44	15	660	44		0	
Bulldozer D4C	D	0	8	3.00	0.00		0			0			0	
Excavator - Trencher	D	1	6	2.00	12.00		0		22	264	12	10	120	12
Excavator - Earth Scraper	D	0	8	9.00	0.00	0	0		0	0			0	
Excavator - Motor Grader	D	1	8	5.00	40.00	10	400	40	15	600	40	10	400	40
Excavator - Backhoe/loader* Days per unit or	D	2	8	2.50	40.00	10	400	40	22	880	40	22	880	40
Excavator - loader	D	1	8	2.50	20.00	10	200	20	22	440	20		0	
Vibratory Roller	D	0	8	10.00	0.00		0			0			0	
Portable Compaction Roller	D	1	6	10.00	60.00		0		12	720	60	10	600	60
Truck - Water	D	1	4	3.13	12.52	10	125.2	12.52	22	275.44	12.52	22	275.44	12.52
Forklift* days per unut or lift-days?	D	3	6	2.50	45.00		0		10	450	45	22	990	45
Dump Truck* days per unit or truuckdays	D	2	6	3.13	37.56	10	375.6	37.56	22	826.32	37.56	22	826.32	37.56
Service Truck - 1 ton	D	2	4	1.56	12.48		0		22	274.56	12.48	22	274.56	12.48
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	6	3.13	18.78		0		5	93.9	18.78	5	93.9	18.78
Tractor Truck 5th Wheel	D	1	4	3.13	12.52		0		22	275.44	12.52	10	125.2	12.52
Trucks - Pickup 3/4 ton	G	2	2	0.78	3.12	10	31.2	3.12	22	68.64	3.12	22	68.64	3.12
Trucks - 3 ton	D	2	2	1.56	6.24	20	124.8	6.24	22	137.28	6.24	10	62.4	6.24
Diesel Powered Welder	D	1	4	1.27	5.08		0			0		22	111.76	5.08
Light Plants	D	0	8	1.27	0.00		0			0			0	
Portable Compaction - Vibratory Plate	G	1	8	0.25	2.00		0		10	20	2	10	20	2
Portable Compaction - Vibratory Ram	D	1	8	0.25	2.00		0		10	20	2	10	20	2
Articulating Boom Platform	D	2	6	0.25	3.00		0			0		22	66	3
Pumps	G	2	8	0.13	2.08	0	0		5	10.4	2.08	5	10.4	2.08
Air Compressor 185 CFM	D	1	8	1.27	10.16		0			0			0	
Air Compressor 750 CFM	D	0	8	1.27	0.00		0			0			0	
Concrete Vibrators	D	1	8	0.25	2.00		0		5	10	2	5	10	2
Concrete Trowel Machine	D	1	8	1.27	10.16		0		5	50.8	10.16	5	50.8	10.16
Fusion Welder	D	0	8	1.27	0.00		0			0			0	
Portable Power Generators	D	0	8	1.27	0.00		0			0			0	
Total =					508		2159	210		6214.50	388.72		5818.14	378

Gasoline

Monthly Site Construction Equipment Use
Riverside Energy Resource Center Project

	1														
	January			February			March			April			May		
Equipment	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day	Days	Gal/ month	Gal/day	Days	Gal/ month	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 D6H		0			0			0			0			0	
Bulldozer D4C		0			0			0			0			0	
Excavator - Trencher		0			0			0			0			0	
Excavator - Earth Scraper		0			0			0			0			0	
Excavator - Motor Grader		0			0			0		10	400	40		0	
Excavator - Backhoe/loader* Days per unit or	15	600	40	10	400	40	10	400	40		0			0	
Excavator - loader		0			0			0			0			0	
Vibratory Roller		0			0			0		10	0	0	10	0	0
Portable Compaction Roller		0			0			0			0			0	
Truck - Water	22	275.44	12.52	22	275.44	12.52	22	275.44	12.52	22	275.44	12.52	0	0	
Forklift* days per unut or lift-days?	22	990	45	22	990	45	22	990	45	22	990	45	10	450	45
Dump Truck* days per unit or truuckdays	15	563.4	37.56	10	375.6	37.56		0			0			0	
Service Truck - 1 ton	22	274.56	12.48	10	124.8	12.48	10	124.8	12.48		0			0	
Truck - Fuel/Lube	22	137.72	6.26		0			0			0			0	
Concrete Pumper Truck	3	56.34	18.78		0			0			0			0	
Tractor Truck 5th Wheel	10	125.2	12.52	10	125.2	12.52	10	125.2	12.52		0			0	
Trucks - Pickup 3/4 ton	22	68.64	3.12	22	68.64	3.12	22	68.64	3.12	22	68.64	3.12	10	31.2	3.12
Trucks - 3 ton	10	62.4	6.24	10	62.4	6.24		0			0			0	
Diesel Powered Welder	22	111.76	5.08	22	111.76	5.08	22	111.76	5.08		0			0	
Light Plants		0			0			0			0			0	
Portable Compaction - Vibratory Plate		0			0			0		10	20	2	10	20	2
Portable Compaction - Vibratory Ram		0			0			0			0			0	
Articulating Boom Platform	22	66	3	22	66	3		0			0			0	
Pumps		0			0			0			0			0	
Air Compressor 185 CFM	22	223.52	10.16	15	152.4	10.16	15	152.4	10.16	15	152.4	10.16		0	
Air Compressor 750 CFM		0			0			0			0			0	
Concrete Vibrators	3	6	2		0			0			0			0	
Concrete Trowel Machine	3	30.48	10.16		0			0			0			0	
Fusion Welder		0			0			0			0			0	
Portable Power Generators		0			0			0			0			0	
Total =		4481	310		3112	228		2848	197		2066	129		501	50

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 D6H		0		1100	200
Bulldozer D4C		0		0	0
Excavator - Trencher		0		384	192
Excavator - Earth Scraper		0		0	0
Excavator - Motor Grader		0		1800	360
Excavator - Backhoe/loader* Days per unit or		0		3560	1424
Excavator - loader		0		640	256
Vibratory Roller		0		0	0
Portable Compaction Roller		0		1320	132
Truck - Water		0		1777.84	568
Forklift* days per unut or lift-days?		0		5850	2340
Dump Truck* days per unit or truuckdays		0		2967.24	948
Service Truck - 1 ton		0		1073.28	688
Truck - Fuel/Lube		0		475.76	152
Concrete Pumper Truck		0		244.14	78
Tractor Truck 5th Wheel		0		776.24	248
Trucks - Pickup 3/4 ton	10	31.2	3.12	505.44	648
Trucks - 3 ton		0		449.28	288
Diesel Powered Welder		0		447.04	352
Light Plants		0		0	0
Portable Compaction - Vibratory Plate		0		80	320
Portable Compaction - Vibratory Ram		0		40	160
Articulating Boom Platform		0		198	792
Pumps		0		20.8	160
Air Compressor 185 CFM		0		680.72	536
Air Compressor 750 CFM		0		0	0
Concrete Vibrators		0		26	104
Concrete Trowel Machine		0		132.08	104
Fusion Welder		0		0	0
Portable Power Generators		0		0	0
Total =		31	3	27233	11590

Gasoline

Site Daily Combustion Equipment Operating Schedule
Riverside Energy Resource Center Project

Equipment	Gasoline/ Diesel	Number of Units	Hrs/Day Per Unit	Gals/Hr Per Unit	Total Fuel Use (Gals/day)	November Earthmoving Phase			November Construction Phase			December Construction Phase		
						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	4	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 D6H	D	1	8	5.50	44.00	15	660	44		0			0	
Bulldozer D4C	D	0	8	3.00	0.00		0			0			0	
Excavator - Trencher	D	1	6	2.00	12.00	12	144	12	10	120	12	10	120	12
Excavator - Earth Scraper	D	0	8	9.00	0.00	0	0			0			0	
Excavator - Motor Grader	D	1	8	5.00	40.00	15	600	40		0			0	
Excavator - Backhoe/loader* Days per unit	D	2	8	2.50	40.00	12	480	40	10	400	40	22	880	40
Excavator - loader	D	1	8	2.50	20.00	12	240	20	10	200	20	10	200	20
Vibratory Roller	D	0	8	10.00	0.00		0			0			0	
Portable Compaction Roller	D	1	6	10.00	60.00	12	720	60	0	0		0	0	
Truck - Water	D	1	4	3.13	12.52	12	150.24	12.52	10	125.2	12.52	22	275.44	12.52
Forklift* days per unut or lift-days?	D	3	6	2.50	45.00		0		10	450	45	22	990	45
Dump Truck* days per unit or truuckdays	D	2	6	3.13	37.56	12	450.72	37.56	10	375.6	37.56	22	826.32	37.56
Service Truck - 1 ton	D	2	4	1.56	12.48	12	149.76	12.48	10	124.8	12.48	22	274.56	12.48
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	6	3.13	18.78		0		5	93.9	18.78	5	93.9	18.78
Tractor Truck 5th Wheel	D	1	4	3.13	12.52	12	150.24	12.52	10	125.2	12.52	10	125.2	12.52
Trucks - Pickup 3/4 ton	G	2	2	0.78	3.12	12	37.44	3.12	10	31.2	3.12	22	68.64	3.12
Trucks - 3 ton	D	2	2	1.56	6.24	12	74.88	6.24	10	62.4	6.24	10	62.4	6.24
Diesel Powered Welder	D	1	4	1.27	5.08		0			0		22	111.76	5.08
Light Plants	D	0	8	1.27	0.00		0			0			0	
Portable Compaction - Vibratory Plate	G	1	8	0.25	2.00		0		10	20	2	10	20	2
Portable Compaction - Vibratory Ram	D	1	8	0.25	2.00		0		10	20	2	10	20	2
Articulating Boom Platform	D	2	6	0.25	3.00		0			0		22	66	3
Pumps	G	2	8	0.13	2.08		0		5	10.4	2.08	5	10.4	2.08
Air Compressor 185 CFM	D	1	8	1.27	10.16		0			0			0	
Air Compressor 750 CFM	D	0	8	1.27	0.00		0			0			0	
Concrete Vibrators	D	1	8	0.25	2.00		0		5	10	2	5	10	2
Concrete Trowel Machine	D	1	8	1.27	10.16		0		5	50.8	10.16	5	50.8	10.16
Fusion Welder	D	0	8	1.27	0.00		0			0			0	
Portable Power Generators	D	0	8	1.27	0.00		0			0			0	
Total =					508		3932	307		2282	245		5018	298

Site Combistion 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 D6H	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
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	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- 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	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- 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	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
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

Site Combistion 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		0.00	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		0.00	0.00	0.00	0.00	0.00		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		0.00	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	8.28		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	8.28		0.00	0.00	0.00	0.00	0.00	480	115.71	17.74	6.93	0.10	3.97
Bulldozer D6H	1	226.75	56.00	15.00	0.21	10.88	44	9.98	2.46	0.66	0.01	0.48	1780	403.61	99.67	26.71	0.37	19.36
Bulldozer D4C	1	202.03	137.47	20.79	0.21	18.44		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Excavator- Trencher	1	202.03	137.47	20.79	0.21	18.44	12	2.42	1.65	0.25	0.00	0.22	384	77.58	52.79	7.98	0.08	7.08
Excavator- Earth Scraper	1	223.74	48.29	13.68	0.21	9.43		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Excavator-Motor Grader	1	226.75	56.00	15.00	0.21	10.88	40	9.07	2.24	0.60	0.01	0.44	1800	408.15	100.79	27.01	0.37	19.58
Excavator- Backhoe/loader	1	200.23	197.65	38.81	0.21	26.63	40	8.01	7.91	1.55	0.01	1.07	3560	712.82	703.64	138.17	0.74	94.81
Excavator - loader	1	202.03	137.47	20.79	0.21	18.44	20	4.04	2.75	0.42	0.00	0.37	640	129.30	87.98	13.31	0.13	11.80
Vibratory Roller	1	226.75	56.00	15.00	0.21	10.88		0.00	0.00	0.00	0.00	0.00		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	1200	268.48	57.95	16.41	0.25	11.32
Truck- Water	na	170.68	106.79	15.33	0.21	9.59	12.5	2.13	1.33	0.19	0.00	0.12	1778	303.47	189.87	27.25	0.37	17.06
Forklift	1	202.03	137.47	20.79	0.21	18.44		0.00	0.00	0.00	0.00	0.00	5850	1181.89	804.22	121.63	1.21	107.86
Dump Truck	na	170.68	106.79	15.33	0.21	9.59	37.6	6.42	4.02	0.58	0.01	0.36	2967	506.41	316.84	45.47	0.62	28.46
Service Truck- 1 ton	na	74.40	59.47	5.57	0.21	4.83	12.5	0.93	0.74	0.07	0.00	0.06	1073	79.84	63.81	5.97	0.23	5.19
Truck- Fuel/Lube	na	170.68	106.79	15.33	0.21	9.59	6.3	1.08	0.67	0.10	0.00	0.06	476	81.24	50.83	7.30	0.10	4.57
Concrete Pumper Truck	na	170.68	106.79	15.33	0.21	9.59		0.00	0.00	0.00	0.00	0.00	244	41.65	26.06	3.74	0.05	2.34
Tractor Truck 5th Wheel	na	170.68	106.79	15.33	0.21	9.59	12.5	2.13	1.33	0.19	0.00	0.12	626	106.85	66.85	9.59	0.13	6.00
Trucks- Pickup 3/4 ton	na	62.81	677.30	46.28	0.27	1.56	3.12	0.20	2.11	0.14	0.00	0.00	505	31.72	342.04	23.37	0.14	0.79
Trucks- 3 ton	na	74.40	59.47	5.57	0.21	4.83	6.24	0.46	0.37	0.03	0.00	0.03	437	32.51	25.99	2.43	0.09	2.11
Diesel Powered Welder	0	297.01	502.84	161.30	0.20	58.01		0.00	0.00	0.00	0.00	0.00	447	132.76	224.77	72.10	0.09	25.93
Light Plants	0	270.01	195.66	70.44	0.21	27.64		0.00	0.00	0.00	0.00	0.00		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		0.00	0.00	0.00	0.00	0.00	80	21.18	15.35	5.52	0.02	2.16
Portable Compaction- Vibratory Ram	0	264.71	191.82	69.06	0.21	27.03		0.00	0.00	0.00	0.00	0.00	40	10.59	7.67	2.76	0.01	1.08
Articulating Boom Platforms	0	246.77	417.78	134.01	0.20	47.58		0.00	0.00	0.00	0.00	0.00	198	48.86	82.72	26.53	0.04	9.42
Pumps	na	79.44	13813.38	748.58	0.27	2.35		0.00	0.00	0.00	0.00	0.00	21	1.67	290.08	15.72	0.01	0.05
Air Compressor 185 CFM	0	270.01	195.66	70.44	0.21	27.64		0.00	0.00	0.00	0.00	0.00	681	183.87	133.24	47.97	0.14	18.83
Air Compressor 750 CFM	0	270.01	195.66	70.44	0.21	27.64		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Concrete Vibrators	0	248.99	290.58	71.79	0.21	33.71		0.00	0.00	0.00	0.00	0.00	26	6.47	7.56	1.87	0.01	0.88
Concrete Trowel Machine	0	248.99	290.58	71.79	0.21	33.71		0.00	0.00	0.00	0.00	0.00	133	33.12	38.65	9.55	0.03	4.48
Fusion Welder	0	246.77	417.78	134.01	0.20	47.58		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Portable Power Generators	0	264.71	191.82	69.06	0.21	27.03		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
							306.8						27631					

	Totals	60.30	30.49	5.60	0.06	3.89		5445.42	3879.22	694.77	5.78	421.18
							Tons/yr	2.72	1.94	0.35	0.00	0.21

(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.

Site Combistion Emissions - November Construction 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 D6H	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
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	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- 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	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- 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	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
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

Site Combistion Emissions - November Construction 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 Construction 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		0.00	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		0.00	0.00	0.00	0.00	0.00		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		0.00	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	8.28		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	8.28		0.00	0.00	0.00	0.00	0.00	480	115.71	17.74	6.93	0.10	3.97
Bulldozer D6H	1	226.75	56.00	15.00	0.21	10.88		0.00	0.00	0.00	0.00	0.00	2200	498.85	123.19	33.01	0.46	23.93
Bulldozer D4C	1	202.03	137.47	20.79	0.21	18.44		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Excavator- Trencher	1	202.03	137.47	20.79	0.21	18.44	12	2.42	1.65	0.25	0.00	0.22	384	77.58	52.79	7.98	0.08	7.08
Excavator- Earth Scraper	1	223.74	48.29	13.68	0.21	9.43		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Excavator-Motor Grader	1	226.75	56.00	15.00	0.21	10.88		0.00	0.00	0.00	0.00	0.00	1800	408.15	100.79	27.01	0.37	19.58
Excavator- Backhoe/loader	1	200.23	197.65	38.81	0.21	26.63	40	8.01	7.91	1.55	0.01	1.07	3560	712.82	703.64	138.17	0.74	94.81
Excavator - loader	1	202.03	137.47	20.79	0.21	18.44	20	4.04	2.75	0.42	0.00	0.37	640	129.30	87.98	13.31	0.13	11.80
Vibratory Roller	1	226.75	56.00	15.00	0.21	10.88		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Portable Compaction roller	1	223.74	48.29	13.68	0.21	9.43		0.00	0.00	0.00	0.00	0.00	1200	268.48	57.95	16.41	0.25	11.32
Truck- Water	na	170.68	106.79	15.33	0.21	9.59	12.5	2.13	1.33	0.19	0.00	0.12	1778	303.47	189.87	27.25	0.37	17.06
Forklift	1	202.03	137.47	20.79	0.21	18.44	45	9.09	6.19	0.94	0.01	0.83	5850	1181.89	804.22	121.63	1.21	107.86
Dump Truck	na	170.68	106.79	15.33	0.21	9.59	37.6	6.42	4.02	0.58	0.01	0.36	2967	506.41	316.84	45.47	0.62	28.46
Service Truck- 1 ton	na	74.40	59.47	5.57	0.21	4.83	12.5	0.93	0.74	0.07	0.00	0.06	1073	79.84	63.81	5.97	0.23	5.19
Truck- Fuel/Lube	na	170.68	106.79	15.33	0.21	9.59	6.3	1.08	0.67	0.10	0.00	0.06	476	81.24	50.83	7.30	0.10	4.57
Concrete Pumper Truck	na	170.68	106.79	15.33	0.21	9.59	18.8	3.21	2.01	0.29	0.00	0.18	244	41.65	26.06	3.74	0.05	2.34
Tractor Truck 5th Wheel	na	170.68	106.79	15.33	0.21	9.59	12.5	2.13	1.33	0.19	0.00	0.12	626	106.85	66.85	9.59	0.13	6.00
Trucks- Pickup 3/4 ton	na	62.81	677.30	46.28	0.27	1.56	3.12	0.20	2.11	0.14	0.00	0.00	505	31.72	342.04	23.37	0.14	0.79
Trucks- 3 ton	na	74.40	59.47	5.57	0.21	4.83	6.24	0.46	0.37	0.03	0.00	0.03	437	32.51	25.99	2.43	0.09	2.11
Diesel Powered Welder	0	297.01	502.84	161.30	0.20	58.01		0.00	0.00	0.00	0.00	0.00	447	132.76	224.77	72.10	0.09	25.93
Light Plants	0	270.01	195.66	70.44	0.21	27.64		0.00	0.00	0.00	0.00	0.00		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	2	0.53	0.38	0.14	0.00	0.05	80	21.18	15.35	5.52	0.02	2.16
Portable Compaction- Vibratory Ram	0	264.71	191.82	69.06	0.21	27.03	2	0.53	0.38	0.14	0.00	0.05	40	10.59	7.67	2.76	0.01	1.08
Articulating Boom Platforms	0	246.77	417.78	134.01	0.20	47.58		0.00	0.00	0.00	0.00	0.00	198	48.86	82.72	26.53	0.04	9.42
Pumps	na	79.44	13813.38	748.58	0.27	2.35	2	0.16	27.63	1.50	0.00	0.00	21	1.67	290.08	15.72	0.01	0.05
Air Compressor 185 CFM	0	270.01	195.66	70.44	0.21	27.64		0.00	0.00	0.00	0.00	0.00	681	183.87	133.24	47.97	0.14	18.83
Air Compressor 750 CFM	0	270.01	195.66	70.44	0.21	27.64		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Concrete Vibrators	0	248.99	290.58	71.79	0.21	33.71	2	0.50	0.58	0.14	0.00	0.07	26	6.47	7.56	1.87	0.01	0.88
Concrete Trowel Machine	0	248.99	290.58	71.79	0.21	33.71	10	2.49	2.91	0.72	0.00	0.34	133	33.12	38.65	9.55	0.03	4.48
Fusion Welder	0	246.77	417.78	134.01	0.20	47.58		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
Portable Power Generators	0	264.71	191.82	69.06	0.21	27.03		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
							245						28051					

	Totals	44.33	62.97	7.38	0.05	3.94		5540.66	3902.74	701.07	5.87	425.75
							Tons/yr	2.77	1.95	0.35	0.00	0.21

(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 /day	Trips / hoursProject	VMT/Trip (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	Daily Emissions (lbs)	Project Emissions (lbs)
Dump Trucks (2 trucks 6 trips/day each)	round trips	12	1020	0.4	4.8	408	8.5	3.5	22.7	6	10	0.85235	90%	90%	0.41	34.78
Service Trucks / Utility vehicles/ misc deliv.	round trips	5	400	0.4	2	160	8.5	7	4	6	10	0.50568	90%	90%	0.10	8.09
Crew / Visitor Passenger Vehicles (10 employees, 10 visitors per day during grading. 50 employees, 10 visitors/day, 75% annual average adjustment)	round trips	20	6930	0.68	13.6	4712.4	8.5	7	2	4	10	0.25416	90%	90%	0.35	119.77
Tractor Trailor Trucks (heavy equipment deliveries)	round trips	4	16	0.4	1.6	6.4	8.5	7	27	18	10	3.33384	90%	90%	0.53	2.13
Water Truck operating 45 minutes per hour, 7 months, 22 day/month	round trips	4	616	0.2625	1.05	161.7	8.5	3.5	29	6	10	1.01176	90%	90%	0.11	16.36
Total															1.50	181.13
Source				*Roundtrip, Water Truck VMT reflects project Excavation*			*US EPA AP-42, 13.2.2-1, Dec. 2003 - for construction sites*	*SCAQMD CEQA Table A-9-9-D-2 for passenger, reasonable estimate for HD*	*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)*					

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

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

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 - Trencher (Trencor 780 HD) 75% transit	6.9	15	4.5	135	1.83	54.78
Excavator - Motor Grader (Komatsu SAA6D114E-2) 75% transit	6.9	15	6	270	2.43	109.56
Excavator - Backhoe/loader (Caterpillar 430D) 25% transit	6.9	15	4	178	1.62	72.23
Excavator - Loader (Caterpillar 916 loader) 50% transit	6.9	15	4	240	1.62	97.39
Bulldozer - D6H 75% transit	6.9	15	6	150	2.43	60.87
Total					9.94	394.82
Source:	USEPA, AP-42, Jan 1995, Table 11.9-3	*SCAQMD CEQA Table A9-9-F-2*				

On-Site Fugitive Construction Emissions During Grading Operations

Wind Erosion

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

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 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 Particulated 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 (13 acres)	Project PM_{10} Emissions per Acre (lbs)	Project PM_{10} Emissions (13 acres)
13 acres	6.9	10	1.7	160	0.01	0.09	1.07	13.92
Source:	USEPA, AP-42, Jan 1995, Table 11.9-3	*SCAQMD CEQA Table A9-9-E-2 (worst case - SCAB/drought)*						

On-Site Fugitive Construction Emissions During Grading Operations

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
	1.73	3.87

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 12 trucks per day	3.87	15	120,000	45	1.81	81.45
Source:		*SCAQMD CEQA Table A9-9-G-1 (worst case - SCAB/drought)*				

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	60	3600	154	na	0.0021	7.69	1183.64
Truck	12	30	360	154	0.1348	0.31	110.90	17078.17

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