APPENDIX 4.3-B

AIR QUALITY CONSTRUCTION EMISSIONS FOR SALT CREEK SUBSTATION PROPONENT'S ENVIRONMENTAL ASSESSMENT (PEA)

Prepared by
Scientific Resources Associated
1328 Kaimalino Lane
San Diego, CA 92109

August 2013

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-1. 2014 Maximum Daily Construction Emissions, Construction Heavy Equipment Use

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Salt Creek Substation - General Construction																							
Air Compressor	DIESEL	78	0.48	0.0758	0.3054	0.3897	0.0006	0.0248	0.0220381	47.0	0.0068	0.0370	1	8	0.61	2.44	3.12	0.00	0.20	0.18	375.60	0.05	0.30
Mechanic Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	9	1.19	3.39	9.94	0.02	0.33	0.30	1498.91	0.11	0.94
Subtotal															**1.80**	**5.83**	**13.06**	**0.02**	**0.53**	**0.47**	**1874.51**	**0.16**	**1.24**
Salt Creek Substation - Substation General Construction																							
Air Compressor	DIESEL	78	0.48	0.0758	0.3054	0.3897	0.0006	0.0248	0.0220381	47.0	0.0068	0.0370	1	6	0.45	1.83	2.34	0.00	0.15	0.13	281.70	0.04	0.22
Mechanic Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	2	0.27	0.75	2.21	0.00	0.07	0.07	333.09	0.02	0.21
Subtotal															**0.72**	**2.58**	**4.55**	**0.01**	**0.22**	**0.20**	**614.79**	**0.06**	**0.43**
Salt Creek Substation Site Access and Grading																							
Bulldozer	DIESEL	358	0.59	0.3072	1.2107	1.8845	0.0026	0.0698	0.0621646	264.8725	0.0277	0.1790	1	8	2.46	9.69	15.08	0.02	0.56	0.50	2118.98	0.22	1.43
Road Grader/Blade	DIESEL	162	0.61	0.1386	0.8061	0.8962	0.0014	0.0479	0.0426564	124	0.0125	0.0851	1	8	1.11	6.45	7.17	0.01	0.38	0.34	991.37	0.10	0.68
Compactor	DIESEL	84	0.56	0.0921	0.3837	0.4896	0.0007	0.0311	0.0276889	59.0	0.0083	0.0465	1	8	0.74	3.07	3.92	0.01	0.25	0.22	471.91	0.07	0.37
Backhoe, loader, skid steer	DIESEL	37	0.55	0.0443	0.1839	0.2387	0.0003	0.0202	0.0179678	25.5	0.0040	0.0227	1	8	0.35	1.47	1.91	0.00	0.16	0.14	204.15	0.03	0.18
Water Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	2	8	2.12	6.02	17.68	0.03	0.59	0.52	2664.73	0.19	1.68
Street Sweeper	DIESEL	88		0.0991	0.5098	0.6481	0.0009	0.0543	0.0483083	75.0	0.0089	0.0616	1	8	0.79	4.08	5.18	0.01	0.43	0.39	600.32	0.07	0.49
Dump/Haul Truck	DIESEL	381		0.2065	0.3761	1.1048	0.0027	0.0368	0.0327961	272.3	0.0186	0.1050	12	2	4.96	9.03	26.52	0.06	0.88	0.79	6536.02	0.45	2.52
Subtotal															**12.53**	**39.80**	**77.45**	**0.14**	**3.26**	**2.90**	**13587.48**	**1.13**	**7.36**
Salt Creek Substation Storm Drain System and Erosion Control																							
Loader	DIESEL	87	0.55	0.0902	0.3903	0.4981	0.0007	0.0316	0.0281657	58.9	0.0081	0.0473	1	8	0.72	3.12	3.98	0.01	0.25	0.23	471.31	0.07	0.38
Water Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	8	1.06	3.01	8.84	0.01	0.29	0.26	1332.36	0.10	0.84
Excavator	DIESEL	157	0.57	0.1134	0.7300	0.8115	0.0013	0.0434	0.03862906	112	0.0102	0.0771	1	8	0.91	5.84	6.49	0.01	0.35	0.31	897.77	0.08	0.62
Subtotal															**2.69**	**11.97**	**19.32**	**0.03**	**0.90**	**0.80**	**2701.44**	**0.24**	**1.83**
Salt Creek Substation CMU Wall																							
Fork Lift	DIESEL	83	0.6	0.0877	0.4062	0.5184	0.0007	0.0329	0.0293135	62.4	0.0079	0.0492	2	2	0.35	1.62	2.07	0.00	0.13	0.12	249.80	0.03	0.20
Trencher/Ditch Witch	DIESEL	69	0.75	0.1212	0.4221	0.6069	0.0008	0.0342	0.0304613	64.9	0.0109	0.0577	1	6	0.73	2.53	3.64	0.00	0.21	0.18	389.37	0.07	0.35
Water Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	3	0.40	1.13	3.31	0.01	0.11	0.10	499.64	0.04	0.31
Excavator/Drill	DIESEL	157	0.57	0.1134	0.7300	0.8115	0.0013	0.0434	0.03862906	112	0.0102	0.0771	1	6	0.68	4.38	4.87	0.01	0.26	0.23	673.33	0.06	0.46
Subtotal															**2.16**	**9.67**	**13.90**	**0.02**	**0.71**	**0.63**	**1812.14**	**0.19**	**1.32**
Simultaneous Construction Equipment															**19.89**	**69.85**	**128.27**	**0.22**	**5.62**	**5.00**	**20590.36**	**1.79**	**12.19**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-2. 2014 Maximum Daily Construction Emissions, Construction Truck Trips

Vehicle	Vehicle Class	Peak No. of Trucks per day	Speed (mph)	VMT (mi/vehicle day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day: CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Salt Creek Substation - General Construction																												
Foreman Pick-Up	Light Duty Truck 1, Diesel	3	15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.11	0.24	0.02	0.00	0.03	0.02	0.02	0.00	117.18	0.01	0.00
Delivery Trucks	Heavy Duty Truck, Diesel	1	35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.20	1.38	0.05	0.00	0.06	0.05	0.01	0.00	196.04	0.01	0.01
Subtotal																		**0.31**	**1.62**	**0.07**	**0.00**	**0.10**	**0.07**	**0.03**	**0.01**	**313.22**	**0.02**	**0.01**
Substation General Construction																												
Foreman Pick-Up	Light Duty Truck 1, Diesel	3	15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.11	0.24	0.02	0.00	0.03	0.02	0.02	0.00	117.18	0.01	0.00
Delivery Trucks	Heavy Duty Truck, Diesel	1	35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.20	1.38	0.05	0.00	0.06	0.05	0.01	0.00	196.04	0.01	0.01
Subtotal																		**0.31**	**1.62**	**0.07**	**0.00**	**0.10**	**0.07**	**0.03**	**0.01**	**313.22**	**0.02**	**0.01**
Site and Access Road Grading																												
Pickup Truck	Light Duty Truck 1, Diesel	12	15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.43	0.97	0.08	0.01	0.14	0.09	0.00	0.00	468.71	0.03	0.01
Dump/Haul Trucks (a)	Heavy Duty Truck, Diesel	1	35	6400	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	15.80	110.45	4.19	0.15	5.18	3.75	0.63	0.13	15683.58	0.90	0.40
Subtotal																		**16.23**	**111.42**	**4.27**	**0.16**	**5.31**	**3.83**	**0.63**	**0.13**	**16152.29**	**0.92**	**0.41**
Storm Drain System and Erosion Control																												
Pickup Truck	Light Duty Truck 1, Diesel	10	15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.36	0.81	0.07	0.00	0.11	0.07	0.06	0.01	390.59	0.02	0.01
Subtotal																		**0.36**	**0.81**	**0.07**	**0.00**	**0.11**	**0.07**	**0.06**	**0.01**	**390.59**	**0.02**	**0.01**
Substation CMU Wall																												
Pickup Truck	Light Duty Truck 1, Diesel	6	15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.22	0.48	0.04	0.00	0.07	0.04	0.04	0.01	234.36	0.01	0.01
Subtotal																		**0.22**	**0.48**	**0.04**	**0.00**	**0.07**	**0.04**	**0.04**	**0.01**	**234.36**	**0.01**	**0.01**
Simultaneous Construction Trucks																		**17.41**	**115.96**	**4.52**	**0.17**	**5.69**	**4.09**	**0.77**	**0.16**	**17403.68**	**0.99**	**0.45**

(a) Construction trucks would travel a total of 6,400 miles per day, divided among trucks importing fill material to the site.

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-3. 2014 Maximum Daily Construction Emissions, Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
General Construction	Light-Duty Truck, catalyst	3	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328
Substation General Construction	Light-Duty Truck, catalyst	3	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328
Site and Access Road Grading	Light-Duty Truck, catalyst	8	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328
Storm Drain System and Erosion Control	Light-Duty Truck, catalyst	5	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328
Substation CMU Wall	Light-Duty Truck, catalyst	8	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328

EMFAC2011 emission factors for 2014

Assume startup after 8 hours
Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
General Construction	Light-Duty Truck, catalyst	3	35	80	1.89	0.17	0.10	0.00	0.03	0.01	0.03	0.01	200.07	0.01	0.02
Substation General Construction	Light-Duty Truck, catalyst	3	35	80	1.89	0.17	0.10	0.00	0.03	0.01	0.03	0.01	200.07	0.01	0.02
Site and Access Road Grading	Light-Duty Truck, catalyst	8	35	80	5.04	0.46	0.26	0.01	0.07	0.03	0.07	0.03	533.51	0.03	0.05
Storm Drain System and Erosion Control	Light-Duty Truck, catalyst	5	35	80	3.15	0.29	0.16	0.00	0.04	0.02	0.04	0.02	333.44	0.02	0.03
Substation CMU Wall	Light-Duty Truck, catalyst	8	35	80	5.04	0.46	0.26	0.01	0.07	0.03	0.07	0.03	533.51	0.03	0.05
Simultaneous Worker Trips					**17.02**	**1.57**	**0.86**	**0.02**	**0.24**	**0.11**	**0.23**	**0.09**	**1800.60**	**0.09**	**0.16**

Table A-4. 2014 Maximum Daily Construction Emissions, Fugitive Dust
Salt Creek Substation

Site and Access Road Grading

Grading - Bulldozer Operations

Emission factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-F
E = ([0.45 x ({[G]^1.5}/{[H]^1.4})] x I) x J
where
G = silt content of material in percent, assumed to be 7.5%
Assume H = 2.0% moisture - unmitigated
Assume H = 15.0% moisture - watering 3 times daily
I = 2.2046 lb/kg
J = hours of bulldozing operations, based on construction scenario, 8 hrs/day for 75 days

	Unmitigated	Mitigated	
E = ([0.45 x ({[G]^1.5}/{[H]^1.4})] x I) x J =	61.770655	3.678717483	lbs/day
	2.3163996	0.137951906	total tons

Earthmoving - Material Handling

Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J]
where
G = Mean wind speed in miles per hour
H = Moisture content of surface material
I = Pounds of overburden handled per day
J = lbs/ton, 2000
For the Salt Creek Substation, assume 12 miles per hour daily maximum wind speed
Assume H = 2.0% moisture - unmitigated
Assume H = 15.0% moisture - watering 3 times daily
I = 95,000 cubic yards x 1600 lbs/cubic yard = 152,000,000 lbs
Assume earthmoving occurs over 30 days, maximum per day could be 10 x daily average

	Unmitigated	Mitigated	
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J] =	88.549268	5.273503101	lbs/day
	0.0079103	0.007910255	total tons

Storm Drain

Earthmoving - Material Handling

Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J]
where
G = Mean wind speed in miles per hour
H = Moisture content of surface material
I = Pounds of overburden handled per day
J = lbs/ton, 2000
For the Salt Creek Substation, assume 12 miles per hour daily maximum wind speed
Assume H = 2.0% moisture - unmitigated
Assume H = 15.0% moisture - watering 3 times daily

I = 2,000 cubic yards x 1600 lbs/cubic yard = 3,200,000 lbs
Assume earthmoving occurs over 30 days, maximum per day could be 10 x daily average

	Unmitigated	Mitigated	
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J] =	1.8641951	0.111021118	lbs/day
	0.0027963	0.000166532	total tons

Substation CMU Wall
Earthmoving - Material Handling
Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J]
where
G = Mean wind speed in miles per hour
H = Moisture content of surface material
I = Pounds of overburden handled per day
J = lbs/ton, 2000
For the Salt Creek Substation, assume 12 miles per hour daily maximum wind speed
Assume H = 2.0% moisture - unmitigated
Assume H = 15.0% moisture - watering 3 times daily
I = 665 cubic yards x 1600 lbs/cubic yard = 800,000 lbs
Assume earthmoving occurs over 30 days, maximum per day could be 10 x daily average

	Unmitigated	Mitigated	
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J] =	0.6198449	0.036914522	lbs/day
	0.0009298	5.53718E-05	total tons

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-5. 2015 Daily Maximum Construction Emissions, Construction Heavy Equipment Use, Salt Creek Substation

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Salt Creek Substation - Substation General Construction																							
Air Compressor	DIESEL	78	0.48	0.0758	0.3054	0.3897	0.0006	0.0248	0.0220381	47.0	0.0068	0.0370	1	6	0.45	1.83	2.34	0.00	0.15	0.13	281.70	0.04	0.22
Mechanic Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	2	0.27	0.75	2.21	0.00	0.07	0.07	333.09	0.02	0.21
Subtotal															**0.72**	**2.58**	**4.55**	**0.01**	**0.22**	**0.20**	**614.79**	**0.06**	**0.43**
Salt Creek Substation Wiring																							
Wiring Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	2	0.27	0.75	2.21	0.00	0.07	0.07	333.09	0.02	0.21
Subtotal															**0.27**	**0.75**	**2.21**	**0.00**	**0.07**	**0.07**	**333.09**	**0.02**	**0.21**
Salt Creek Substation Above Grade Construction																							
Boom Truck	DIESEL	235		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	8	1.06	3.01	8.84	0.01	0.29	0.26	1332.36	0.10	0.84
Water Truck	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	8	1.06	3.01	8.84	0.01	0.29	0.26	1332.36	0.10	0.84
Subtotal															**2.12**	**6.02**	**17.68**	**0.03**	**0.59**	**0.52**	**2664.73**	**0.19**	**1.68**
Simultaneous Construction Equipment															**3.11**	**9.36**	**24.43**	**0.04**	**0.89**	**0.79**	**3612.61**	**0.28**	**2.32**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-6. Daily Maximum Construction Emissions, Construction Truck Trips, Salt Creek Substation

Vehicle	Vehicle Class	Peak No. of Trucks per day	Total No. of Trucks	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Substation General Construction																													
Foreman Pick-Up	Light Duty Truck 1, Diesel	3		15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.11	0.24	0.02	0.00	0.03	0.02	0.00	0.00	117.18	0.01	0.00
Delivery Trucks	Heavy Duty Truck, Diesel	1		35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.20	1.38	0.05	0.00	0.06	0.05	0.00	0.00	196.04	0.01	0.01
Subtotal																			**0.31**	**1.62**	**0.07**	**0.00**	**0.10**	**0.07**	**0.00**	**0.00**	**313.22**	**0.02**	**0.01**
Substation Above Grade Construction																													
Pickup Truck	Light Duty Truck 1, Diesel	3		15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.11	0.24	0.02	0.00	0.03	0.02	0.00	0.00	117.18	0.01	0.00
Subtotal																			**0.11**	**0.24**	**0.02**	**0.00**	**0.03**	**0.02**	**0.00**	**0.00**	**117.18**	**0.01**	**0.00**
Telecom																													
Pick-Up	Light Duty Truck 1, Diesel	1		15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.04	0.08	0.01	0.00	0.01	0.01	0.00	0.00	39.06	0.00	0.00
Subtotal																			**0.04**	**0.08**	**0.01**	**0.00**	**0.01**	**0.01**	**0.00**	**0.00**	**39.06**	**0.00**	**0.00**
Simultaneous Construction Trucks																			**0.45**	**1.95**	**0.10**	**0.00**	**0.14**	**0.10**	**0.00**	**0.00**	**469.46**	**0.03**	**0.01**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-7. Daily Maximum Construction Emissions, Worker Trips, Salt Creek Substation

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Substation General Construction	Light-Duty Truck, catalyst	3	35	80	3.097499636	38.14685119	0.301283873	2.236170577	0.094166774	3.031413185	1.876347192	0.796435959	0.200509602	1.078686691	0.004047839	0.005840781	0.00437055	0.034040096	0.007999958	0.036749816	0.00399961	0.031110746	0.00199999	0.01574992	372.0083571	488.7328404	0.0177	0.024075468	0.03	0.010593284
Substation Wiring	Light-Duty Truck, catalyst	3	35	80	3.097499636	38.14685119	0.301283873	2.236170577	0.094166774	3.031413185	1.876347192	0.796435959	0.200509602	1.078686691	0.004047839	0.005840781	0.00437055	0.034040096	0.007999958	0.036749816	0.00399961	0.031110746	0.00199999	0.01574992	372.0083571	488.7328404	0.0177	0.024075468	0.03	0.010593284
Substation Above Grade Construction	Light-Duty Truck, catalyst	10	35	80	3.097499636	38.14685119	0.301283873	2.236170577	0.094166774	3.031413185	1.876347192	0.796435959	0.200509602	1.078686691	0.004047839	0.005840781	0.00437055	0.034040096	0.007999958	0.036749816	0.00399961	0.031110746	0.00199999	0.01574992	372.0083571	488.7328404	0.0177	0.024075468	0.03	0.010593284
Telecom	Light-Duty Truck, catalyst	2	35	80	3.097499636	38.14685119	0.301283873	2.236170577	0.094166774	3.031413185	1.876347192	0.796435959	0.200509602	1.078686691	0.004047839	0.005840781	0.00437055	0.034040096	0.007999958	0.036749816	0.00399961	0.031110746	0.00199999	0.01574992	372.0083571	488.7328404	0.0177	0.024075468	0.03	0.010593284

EMFAC2011 emission factors for 2014

Assume startup after 8 hours

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Substation General Construction	Light-Duty Truck, catalyst	3	35	80	1.89	0.17	0.10	0.00	0.03	0.01	0.03	0.01	200.07	0.01	0.02
Substation Wiring	Light-Duty Truck, catalyst	3	35	80	1.89	0.17	0.10	0.00	0.03	0.01	0.03	0.01	200.07	0.01	0.02
Substation Above Grade Construction	Light-Duty Truck, catalyst	10	35	80	6.30	0.58	0.32	0.01	0.09	0.04	0.08	0.03	666.89	0.03	0.06
Telecom	Light-Duty Truck, catalyst	2	35	80	1.26	0.12	0.06	0.00	0.02	0.01	0.02	0.01	133.38	0.01	0.01
Simultaneous Worker Trips					**1.89**	**0.17**	**0.10**	**0.00**	**0.03**	**0.01**	**0.03**	**0.01**	**200.07**	**0.01**	**0.02**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-8. Daily Maximum Construction Emissions, Construction Heavy Equipment Use, TL6965

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Trans: TL6965 - OH Conductor Pulling and Tensioning																							
Manlift	DIESEL	34	0.46	0.0534	0.1414	0.1834	0.0003	0.0155	0.0138091	19.6	0.0048	0.0174	2	8	0.85	2.26	2.93	0.00	0.25	0.22	313.80	0.08	0.28
Puller	DIESEL	300		0.1379	0.5080	1.3457	0.0025	0.0441	0.0392193	254.2	0.0124	0.1278	1	8	1.10	4.06	10.77	0.02	0.35	0.31	2033.91	0.10	1.02
Bull Wheel Tensioner	DIESEL	300		0.1379	0.5080	1.3457	0.0025	0.0441	0.0392193	254.2	0.0124	0.1278	1	8	1.10	4.06	10.77	0.02	0.35	0.31	2033.91	0.10	1.02
Reel Trailer	DIESEL	300		0.1379	0.5080	1.3457	0.0025	0.0441	0.0392193	254.2	0.0124	0.1278	1	8	1.10	4.06	10.77	0.02	0.35	0.31	2033.91	0.10	1.02
Boom Truck	DIESEL	235		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	8	1.06	3.01	8.84	0.01	0.29	0.26	1332.36	0.10	0.84
Crane	DIESEL	399	0.43	0.1468	0.9834	1.7248	0.0018	0.0567	0.0504951	180.1	0.0132	0.1639	1	8	1.17	7.87	13.80	0.01	0.45	0.40	1440.81	0.11	1.31
Subtotal															**6.40**	**25.33**	**57.87**	**0.09**	**2.05**	**1.83**	**9188.70**	**0.58**	**5.50**
Trans: TL6965 - Underground Trench/Conduit/Substructure																							
Dump Trucks	DIESEL	381		0.2065	0.3761	1.1048	0.0027	0.0368	0.0327961	272.3	0.0186	0.1050	3	8	4.96	9.03	26.52	0.06	0.88	0.79	6536.02	0.45	2.52
Backhoe	DIESEL	87	0.55	0.0634	0.3903	0.4981	0.0006	0.0316	0.0281657	51.7280	0.0057	0.0473	2	8	1.01	6.24	7.97	0.01	0.51	0.45	827.65	0.09	0.76
Concrete Trucks	DIESEL	235		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	5	4	2.65	7.52	22.10	0.04	0.74	0.66	3330.91	0.24	2.10
Excavator	DIESEL	157	0.57	0.1657	0.7300	0.8115	0.0023	0.0434	0.03862906	234	0.0149	0.0771	1	8	1.33	5.84	6.49	0.02	0.35	0.31	1869.88	0.12	0.62
Subtotal															**9.95**	**28.63**	**63.07**	**0.13**	**2.47**	**2.20**	**12564.45**	**0.90**	**5.99**
Total															**16.35**	**53.97**	**120.94**	**0.22**	**4.53**	**4.03**	**21753.16**	**1.47**	**11.49**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-9. Daily Maximum Construction Emissions, Construction Truck Trips, TL6965

Vehicle	Vehicle Class	Peak No. of Trucks per day	Total No. of Trucks	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Trans: TL6965 - OH Conductor Pulling and Tensioning																													
Delivery Trucks	Heavy Duty Truck, Diesel	3		35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.59	4.14	0.16	0.01	0.19	0.14	0.00	0.00	588.13	0.03	0.02
Subtotal																													
Trans: TL6965 - Underground Trench/Conduit/Substructure																													
Delivery Trucks	Heavy Duty Truck, Diesel	2		35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.39	2.76	0.10	0.00	0.13	0.09	0.00	0.00	392.09	0.02	0.01
Subtotal																													
																			0.99	**6.90**	**0.26**	**0.01**	**0.32**	**0.23**	**0.00**	**0.00**	**980.22**	**0.06**	**0.03**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-10. Daily Maximum Construction Emissions, Worker Trips, TL6965

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
OH Conductor Pulling and Tensioning	Light-Duty Truck, catalyst	24	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328
UG Trench Conduit Substructure	Light-Duty Truck, catalyst	33	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328

EMFAC2011 emission factors for 2014

Assume startup after 8 hours
Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
OH Conductor Pulling and Tensioning	Light-Duty Truck, catalyst	24	35	80	15.13	1.39	0.77	0.02	0.21	0.09	0.20	0.08	1600.53	0.08	0.14
UG Trench Conduit Substructure	Light-Duty Truck, catalyst	33	35	80	20.80	1.92	1.06	0.02	0.29	0.13	0.28	0.11	2200.73	0.10	0.19
Total					**35.93**	**3.31**	**1.82**	**0.04**	**0.50**	**0.22**	**0.48**	**0.20**	**3801.27**	**0.18**	**0.33**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-11. Daily Maximum Construction Emissions, Construction Heavy Equipment Use, TL6910

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Trans: TL6910 - Underground Trench/Conduit/Substructure																							
Dump Trucks	DIESEL	381		0.2065	0.3761	1.1048	0.0027	0.0368	0.0327961	272.3	0.0186	0.1050	4	8	6.61	12.04	35.35	0.09	1.18	1.05	8714.69	0.60	3.36
Backhoe	DIESEL	87	0.55	0.0634	0.3903	0.4981	0.0006	0.0316	0.0281657	51.7280	0.0057	0.0473	2	8	1.01	6.24	7.97	0.01	0.51	0.45	827.65	0.09	0.76
Concrete Trucks	DIESEL	235		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	4	4	2.12	6.02	17.68	0.03	0.59	0.52	2664.73	0.19	1.68
Excavator	DIESEL	157	0.57	0.1657	0.7300	0.8115	0.0023	0.0434	0.03862906	234	0.0149	0.0771	1	8	1.33	5.84	6.49	0.02	0.35	0.31	1869.88	0.12	0.62
Subtotal															**11.07**	**30.14**	**67.49**	**0.14**	**2.62**	**2.33**	**14076.94**	**1.00**	**6.41**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-12. Daily Maximum Construction Emissions, Construction Truck Trips, TL6910

Vehicle	Vehicle Class	Peak No. of Trucks per day	Total No. of Trucks	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_x Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day																	
																			CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O								
Underground Trench/Conduit/Substructure																																			
Dump/Haul Trucks	Heavy Duty Truck, Diesel	2		35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.39	2.76	0.10	0.00	0.13	0.09	0.00	0.00	392.09	0.02	0.01	15	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	2.94	0.00	0.00
Delivery Trucks	Heavy Duty Truck, Diesel	4		35	80	1.119564193	7.828027	0.29672835	0.010712	0.224693	0.01199994	0.13033932	0.206717	0.003	0.0558597	1111.549	0.06351726	0.03	0.79	5.52	0.21	0.01	0.26	0.19	0.00	0.00	784.18	0.04	0.02	5	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.00	0.00
Subtotal																			**1.18**	**8.28**	**0.31**	**0.01**	**0.39**	**0.28**	**0.00**	**0.00**	**1176.27**	**0.07**	**0.03**		**0.00**	**0.03**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**4.90**	**0.00**	**0.00**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-13. Daily Maximum Construction Emissions, Worker Trips, TL6910

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
UG Trench/Conduit/Substructure	Light-Duty Truck, catalyst	5	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328

EMFAC2011 emission factors for 2014

Assume startup after 8 hours
Assume 45 minutes run time total

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
UG Trench/Conduit/Substructure	Light-Duty Truck, catalyst	4	35	80	3.15	0.29	0.16	0.00	0.04	0.02	0.04	0.02	333.44	0.02	0.03
Simultaneous Worker Emissions					**3.15**	**0.29**	**0.16**	**0.00**	**0.04**	**0.02**	**0.04**	**0.02**	**333.44**	**0.02**	**0.03**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-14. Daily Maximum Construction Emissions, Construction Heavy Equipment Use, 12kV Distribution

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Trans: TL6910 - Underground Trench/Conduit/Substructure																							
Dump Trucks	DIESEL	381		0.2065	0.3761	1.1048	0.0027	0.0368	0.0327961	272.3	0.0186	0.1050	1	8	1.65	3.01	8.84	0.02	0.29	0.26	2178.67	0.15	0.84
Compactor	DIESEL	84	0.56	0.0921	0.3837	0.4896	0.0007	0.0311	0.0276889	59.0	0.0083	0.0465	1	8	0.74	3.07	3.92	0.01	0.25	0.22	471.91	0.07	0.37
Subtotal															**2.39**	**6.08**	**12.76**	**0.03**	**0.54**	**0.48**	**2650.58**	**0.22**	**1.21**
Total															**2.39**	**6.08**	**12.76**	**0.03**	**0.54**	**0.48**	**2650.58**	**0.22**	**1.21**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

ROG	SOx	PM10			PM2.5			CO2	CH4	N2O	Emissions, lbs/day										
Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	Running Exhaust (g/mi)	CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
											0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-16. Daily Maximum Construction Emissions, Worker Trips, 12kV Distribution

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
UG Conduit	Light-Duty Truck, catalyst	48	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328

EMFAC2011 emission factors for 2014

Assume startup after 8 hours

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
UG Conduit	Light-Duty Truck, catalyst	48	35	80	30.26	2.79	1.54	0.03	0.42	0.19	0.41	0.17	3201.07	0.15	0.28
Simultaneous Worker Emissions					**30.26**	**2.79**	**1.54**	**0.03**	**0.42**	**0.19**	**0.41**	**0.17**	**3201.07**	**0.15**	**0.28**

Table A-17. 2015 Maximum Daily Construction Emissions, Fugitive Dust, Salt Creek Substation
Salt Creek Substation

Substation Below Grade Construction
Earthmoving - Material Handling
Emission Factor from SCAQMD CEQA Air Quality Handbook, Table A9-9-G
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J]
where
G = Mean wind speed in miles per hour
H = Moisture content of surface material
I = Pounds of overburden handled per day
J = lbs/ton, 2000
For the Salt Creek Substation, assume 12 miles per hour daily maximum wind speed
Assume H = 2.0% moisture - unmitigated
Assume H = 15.0% moisture - watering 3 times daily
I = 3000 cubic yards x 1600 lbs/cubic yard = 4,800,000 lbs
Assume earthmoving occurs over 30 days, maximum per day could be 10 x daily average

	Unmitigated	Mitigated	
E = [0.00112 x ({[G/5]^1.3/}/{[H/2]^1.4})] x [I/J] =	2.7962927	0.166531677	lbs/day
	0.0041944	0.000249798	total tons

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-18. 2016 Maximum Daily Construction Emissions, Construction Heavy Equipment, Salt Creek Substation

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Salt Creek Energization																							
Relay/Telecommunication Van	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	2	0.27	0.75	2.21	0.00	0.07	0.07	333.09	0.02	0.21
Subtotal															**0.27**	**0.75**	**2.21**	**0.00**	**0.07**	**0.07**	**333.09**	**0.02**	**0.21**
Simultaneous Construction Equipment																							

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-19. 2016 Maximum Daily Construction Emissions, Construction Trucks, Salt Creek Substation

Vehicle	Vehicle Class	Peak No. of Trucks per day	Total No. of Trucks	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Salt Creek Energization																													
Foreman Pick-Up	Light Duty Truck 1, Diesel	3		15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.11	0.24	0.02	0.00	0.03	0.02	0.00	0.00	117.18	0.01	0.00
Simultaneous Construction Trucks																			**0.11**	**0.24**	**0.02**	**0.00**	**0.03**	**0.02**	**0.00**	**0.00**	**117.18**	**0.01**	**0.00**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-20. 2016 Maximum Daily Construction Emissions, Worker Trips, Salt Creek Substation

					CO		NO_X		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Salt Creek Energization	Light-Duty Truck, catalyst	3	35	80	3.097499636	38.14685119	0.301283873	2.236170577	0.094166774	3.031413185	1.876347192	0.796435959	0.200509602	1.078686691	0.004047839	0.005840781	0.00437055	0.034040096	0.007999958	0.036749816	0.00399961	0.031110746	0.00199999	0.01574992	372.0083571	488.7328404	0.0177	0.024075468	0.03	0.010593284

EMFAC2011 emission factors for 2014

Assume startup after 8 hours

					Emissions, lbs/day											
Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Salt Creek Energization	Light-Duty Truck, catalyst	3	35	80	1.89	0.17	0.10	0.00	0.03	0.01	0.03	0.01	200.07	0.01	0.02
Simultaneous Worker Trips					**1.89**	**0.17**	**0.10**	**0.00**	**0.03**	**0.01**	**0.03**	**0.01**	**200.07**	**0.01**	**0.02**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-21. 2016 Maximum Daily Construction Emissions, Construction Heavy Equipment, Miguel Substation

				Emission Factors											Emissions								
Equipment/Phase	**FUEL**	**HP**	**Load Factor**	**ROG (lb/hr)**	**CO (lb/hr)**	**NOX (lb/hr)**	**SOX (lb/hr)**	**PM10 (lb/hr)**	**PM2.5 (lb/hr)**	**CO2 (lb/hr)**	**CH4 (lb/hr)**	**N2O (lb/hr)**	**No of Equipment**	**Hrs Per Day**	**ROG lbs/day**	**CO lbs/day**	**NOX lbs/day**	**SOX lbs/day**	**PM10 lbs/day**	**PM2.5 lbs/day**	**CO2 lbs/day**	**CH4 lbs/day**	**N2O lbs/day**
Salt Creek Energization																							
Relay/Telecommunication Van	DIESEL	175		0.1326	0.3761	1.1048	0.0019	0.0368	0.0327961	166.5	0.0120	0.1050	1	2	0.27	0.75	2.21	0.00	0.07	0.07	333.09	0.02	0.21
Subtotal															**0.27**	**0.75**	**2.21**	**0.00**	**0.07**	**0.07**	**333.09**	**0.02**	**0.21**
Simultaneous Construction Equipment																							

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-22. 2016 Maximum Daily Construction Emissions, Construction Trucks, Miguel Substation

Vehicle	Vehicle Class	Peak No. of Trucks per day	Total No. of Trucks	Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_X Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Salt Creek Energization																													
Foreman Pick-Up	Light Duty Truck 1, Diesel	3		15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.11	0.24	0.02	0.00	0.03	0.02	0.00	0.00	117.18	0.01	0.00
Simultaneous Construction Trucks																			**0.11**	**0.24**	**0.02**	**0.00**	**0.03**	**0.02**	**0.00**	**0.00**	**117.18**	**0.01**	**0.00**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-23. 2016 Maximum Daily Construction Emissions, Worker Trips, Miguel Substation

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
Salt Creek Energization	Light-Duty Truck, catalyst	3	35	80	3.097499636	38.14685119	0.301283873	2.236170577	0.094166774	3.031413185	1.876347192	0.796435959	0.200509602	1.078686691	0.00047839	0.005840781	0.00437055	0.034040096	0.007999958	0.036749816	0.00399961	0.031110746	0.00199999	0.01574992	372.0083571	488.7328404	0.0177	0.024075468	0.03	0.010593284

EMFAC2011 emission factors for 2014

Assume startup after 8 hours

Construction Phase	Vehicle Class	No. of Daily Workers Per Construction Phase	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Salt Creek Energization	Light-Duty Truck, catalyst	3	35	80	1.89	0.17	0.10	0.00	0.03	0.01	0.03	0.01	200.07	0.01	0.02
Simultaneous Worker Trips					**1.89**	**0.17**	**0.10**	**0.00**	**0.03**	**0.01**	**0.03**	**0.01**	**200.07**	**0.01**	**0.02**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-24. Maximum Daily Unmitigated Construction Emissions, Summary

2014	Maximum Daily Construction Emissions, lbs/day					
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment	19.89	69.85	128.27	0.22	5.62	5.00
Construction Truck Trips	4.52	17.41	115.96	0.17	6.47	4.25
Worker Trips	0.86	17.02	1.57	0.02	0.46	0.20
Fugitive Dust (Unmitigated)					152.80	32.09
Total	**25.28**	**104.28**	**245.80**	**0.41**	**165.35**	**41.54**

2015	Maximum Daily Construction Emissions, lbs/day					
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment	32.91	99.54	225.62	0.43	8.58	7.64
Construction Truck Trips	0.68	2.62	17.13	0.03	0.86	0.61
Worker Trips	3.62	71.24	6.56	0.08	1.94	0.83
Fugitive Dust (Unmitigated)					2.80	0.59
Total	**37.20**	**173.40**	**249.32**	**0.54**	**14.17**	**9.67**

2016	Maximum Daily Construction Emissions, lbs/day					
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment	0.53	1.50	4.42	0.01	0.15	0.13
Construction Truck Trips	0.04	0.22	0.48	0.00	0.07	0.04
Worker Trips	0.19	3.78	0.35	0.00	0.10	0.04
Total	**0.76**	**5.50**	**5.25**	**0.01**	**0.32**	**0.22**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-25. Maximum Daily Mitigated Construction Emissions, Summary

	Maximum Daily Construction Emissions, lbs/day					
2014						
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment	19.89	69.85	128.27	0.22	5.62	5.00
Construction Truck Trips	4.52	17.41	115.96	0.17	6.47	4.25
Worker Trips	0.86	17.02	1.57	0.02	0.46	0.20
Fugitive Dust (Mitigated)					9.10	1.91
Total	**25.28**	**104.28**	**245.80**	**0.41**	**21.65**	**11.36**

2015	Maximum Daily Construction Emissions, lbs/day					
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment	32.91	99.54	225.62	0.43	8.58	7.64
Construction Truck Trips	0.68	2.62	17.13	0.68	0.86	0.61
Worker Trips	3.62	71.24	6.56	0.08	1.94	0.83
Fugitive Dust (Unmitigated)					0.17	0.03
Total	**37.20**	**173.40**	**249.32**	**1.19**	**11.54**	**9.12**

2016	Maximum Daily Construction Emissions, lbs/day					
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Equipment	0.53	1.50	4.42	0.01	0.15	0.13
Construction Truck Trips	0.04	0.22	0.48	0.00	0.07	0.04
Worker Trips	0.19	3.78	0.35	0.00	0.10	0.04
Total	**0.76**	**5.50**	**5.25**	**0.01**	**0.32**	**0.22**

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-26. ARB and USEPA Off-Road Compression-Ignition (Diesel) Engine Standards (NMHC+NOx/CO/PM in g/bhp-hr). When ARB and USEPA standards differ, the standards shown here represent the more stringent of the two.

Maximum horsepower	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015+
<11	See Table 2 footnote (a)					7.8 / 6.0 / 0.75					5.6 / 6.0 / 0.6			5.6 / 6.0 / 0.30[a]							
11≤hp<25						7.1 / 4.9 / 0.60					5.6 / 4.9 / 0.60			5.6 / 4.9 / 0.30							
25≤hp<50	-					7.1 /4.1 / 0.60					5.6 / 4.1 / 0.45			5.6 / 4.1 / 0.22				3.5 / 4.1 / 0.02			
50≤hp< 75						- / 6.9 / - / -[b]					5.6 / 3.7 / 0.30			3.5 / 3.7 / 0.22[c]				3.5 / 3.7 / 0.02[c]			
75≤hp<100														3.5 / 3.7 / 0.30			0.14 / 2.5 / 3.7 / 0.015[b,d]				0.14 / 0.30 / 3.7 / 0.015[b]
100≤hp<175									4.9 / 3.7 / 0.22				3.0 / 3.7 / 0.22								
175≤hp<300									4.9 / 2.6 / 0.15												
300≤hp<600	-		1.0 / 6.9 / 8.5 / 0.40[b]					4.8 / 2.6 / 0.15				3.0 / 2.6 / 0.15[e]					0.14 / 1.5 / 2.6 / 0.015[b,d]				0.14 / 0.30 / 2.2 / 0.015[b]
600≤hp≤750																					
Mobile Machines > 750hp			-				1.0 / 6.9 / 8.5 / 0.40[b]					4.8 / 2.6 / 0.15					0.30 / 2.6 / 2.6 / 0.07[b]				0.14 / 2.6 / 2.6 / 0.03[b]
750hp<GEN ≤1200hp																					0.14 / 0.50 / 2.6 / 0.02[b]
GEN>1200 hp																	0.30 / 0.50 / 2.6 / 0.07[b]				

a) The PM standard for hand-start, air cooled, direct injection engines below 11 hp may be delayed until 2010 and be set at 0.45 g/bhp-hr.
b) Standards given are NMHC/NOx/CO/PM in g/bhp-hr.
c) Engine families in this power category may alternately meet Tier 3 PM standards (0.30 g/bhp-hr) from 2008-2011 in exchange for introducing final PM standards in 2012.
d) The implementation schedule shown is the three-year alternate NOx approach. Other schedules are available.
e) Certain manufacturers have agreed to comply with these standards by 2005.

: Tier 1 : Tier 2 : Tier 3 : Tier 4 Interim / Final : Tier 2 : Tier 3

	TIER 2 Emission Factors					
	NOx		CO		PM	
Maximum horsepower	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr
<11	5.32	0.0117284	6	0.0132275	0.6	0.0013228
11≤hp<25	5.32	0.0117284	4.9	0.0108025	0.6	0.0013228
25≤hp<50	5.32	0.0117284	4.1	0.0090388	0.45	0.0009921
50≤hp< 75	5.32	0.0117284	3.7	0.008157	0.3	0.0006614
75≤hp<100	5.32	0.0117284	3.7	0.008157	0.3	0.0006614
100≤hp<175	4.655	0.0102623	3.7	0.008157	0.22	0.000485
175≤hp<300	4.655	0.0102623	2.6	0.0057319	0.15	0.0003307
300≤hp<600	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
600≤hp≤750	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
Mobile Machines > 750hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
750hp<GEN ≤1200hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
GEN>1200 hp	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307

	TIER 3 Emission Factors					
	NOx		CO		PM	
	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr	g/bhp-hr	lb/bhp-hr
	5.32	0.0117284	6	0.0132275	0.6	0.0013228
	5.32	0.0117284	4.9	0.0108025	0.6	0.0013228
	5.32	0.0117284	4.1	0.0090388	0.45	0.0009921
	5.32	0.0117284	3.7	0.008157	0.3	0.0006614
	3.325	0.0073302	3.7	0.008157	0.3	0.0006614
	2.85	0.0062831	3.7	0.008157	0.22	0.000485
	2.85	0.0062831	2.6	0.0057319	0.15	0.0003307
	2.85	0.0062831	2.6	0.0057319	0.15	0.0003307
	2.85	0.0062831	2.6	0.0057319	0.15	0.0003307
	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307
	4.56	0.0100529	2.6	0.0057319	0.15	0.0003307

Composite Emission Factors - 70% Tier 2, 30% Tier 3		
NOx	CO	PM
lb/bhp-hr	lb/bhp-hr	lb/bhp-hr
0.011728395	0.013227513	0.001322751
0.011728395	0.010802469	0.001322751
0.011728395	0.009038801	0.000992063
0.011728395	0.008156966	0.000661376
0.010408951	0.008156966	0.000661376
0.009068563	0.008156966	0.000485009
0.009068563	0.005731922	0.000330688
0.008921958	0.005731922	0.000330688
0.008921958	0.005731922	0.000330688
0.01005291	0.005731922	0.000330688
0.01005291	0.005731922	0.000330688
0.01005291	0.005731922	0.000330688
0.01005291	0.005731922	0.000330688

% reduction from TIER 2 to TIER 3		
NOx	CO	PM
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
0.00%	0.00%	0.00%
37.50%	0.00%	0.00%
38.78%	0.00%	0.00%
38.78%	0.00%	0.00%
37.50%	0.00%	0.00%
37.50%	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%

Table A-27. PSR Offroad Load Factors

Used in conjunction with Tier 2-3 emission factors.

Source: mailout MSC99-32,
http://www.arb.ca.gov/msei/onroad/downloads/pubs/mo9932.zip (4/2/2009)

Category	Equipment	Load
Commercial	Air Compressor	0.48
	Generators	0.74
	Pressure Washer	0.30
	Pumps	0.74
	Welders	0.45
	Manlift	0.46

Table A-27. PSR Offroad Load Factors

Used in conjunction with Tier 2-3 emission factors.

Source: mailout MSC99-32,
http://www.arb.ca.gov/msei/onroad/downloads/pubs/mo9932.zip (4/2/2009)

Category	Equipment	Load
Construction	Drill Rig	0.75
	Concrete Saw	0.73
	Crane	0.43
	Crawler Tractor	0.64
	Crushing/Proc. Equipment	0.78
	Excavator	0.57
	Excavator w/ Breaker	0.57
	Excavator/Drill	0.57
	Road Grader/Blade	0.61
	Off-Highway Tractor	0.65
	Dump/Haul Truck	0.57
	Water Truck	0.57
	Cable Dolly	0.62
	Paver	0.62
	Paving Equipment	0.53
	Compactor	0.56
	Fork Lift	0.60
	Bulldozer	0.59
	Backhoe - Rubber tire	0.54
	Scraper	0.72
	Signal Board	0.78
	Backhoe, loader, skid steer	0.55
	Skid Steer Loader	0.55
	Skid Steer / Skip Loader	0.55
	Surfacing Equipment	0.45
	Street Sweeper	
	Backhoe	0.55
	Loader	0.55
	Trencher/Ditch Witch	0.75

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-28. Maximum Daily Operational Emissions, Trucks

Operational Vehicles	Vehicle Class	Peak No. of Trucks per day		Speed (mph)	VMT (mi/vehicle-day)	CO Running Exhaust (g/mi)	NO_x Running Exhaust (g/mi)	ROG Running Exhaust (g/mi)	SOx Running Exhaust (g/mi)	PM10 Running Exhaust (g/mi)	PM10 Tire Wear (g/mi)	PM10 Brake Wear (g/mi)	PM2.5 Running Exhaust (g/mi)	PM2.5 Tire Wear (g/mi)	PM2.5 Brake Wear (g/mi)	CO2 Running Exhaust (g/mi)	CH4 Running Exhaust (g/mi)	N2O Running Exhaust (g/mi)	Emissions, lbs/day CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O	Support Days	Total Emissions, tons CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Support/Delivery Vehicles																																								
3/4 Ton Truck, Pick-Up	Light Duty Truck 1, Diesel	2		15	60	0.271736729	0.610084	0.05175358	0.003186	0.040573	0.00799996	0.03674982	0.037327	0.002	0.0157499	295.2811	0.01687325	0.01	0.07	0.16	0.01	0.00	0.02	0.01	0.01	0.00	78.12	0.00	0.00	30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.17	0.0001	0.0000

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-29. Maximum Daily Operational Emissions, Worker Trips

Construction Phase	Vehicle Class	No. of Daily Workers Operations	Speed (mph)	VMT (mi/vehicle-day)	CO		NO_x		ROG						SOx		PM10				PM2.5				CO2		CH4		N2O	
					Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Hot-Soak (g/vehicle-day)	Resting Loss (g/vehicle-day)	Running Evaporative (g/mi)	Diurnal Evaporative (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Tire Wear (g/mi)	Brake Wear (g/mi)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)	Running Exhaust (g/mi)	Start-Up (g/vehicle-day)
General Construction	Light-Duty Truck, catalyst	10	35	80	3.0975	38.14685	0.301284	2.236171	0.094167	3.031413	1.876347	0.796436	0.20051	1.078687	0.004048	0.005841	0.004371	0.03404	0.008	0.03675	0.004	0.031111	0.002	0.01575	372.0084	488.7328	0.0177	0.02407547	0.03	0.01059328

EMFAC2011 emission factors for 2014

Assume startup after 8 hours
Assume 45 minutes run time total

Operations	Vehicle Class	No. of Daily Workers Operations	Speed (mph)	VMT (mi/vehicle-day)	Emissions, lbs/day											Work Days	Total Emissions, tons										
					CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O		CO	NOx	VOCs	SOx	PM10	PM2.5	Paved Road Fugitive Dust PM10	Paved Road Fugitive Dust PM2.5	CO2	CH4	N2O
Inspection and Maintenance	Light-Duty Truck, catalyst	10	35	40	3.57	0.31	0.24	0.00	0.04	0.02	0.05	0.02	338.83	0.02	0.03	250	0.22	0.02	0.01481	2.31E-04	0.00275	0.00124	0.00282	0.00116	21	0.00101	0.00181

Table B-1
Construction Heavy Equipment Emissions
Salt Creek Substation Construction

Table A-30. Maximum Daily Mitigated Operational Emissions, Summary

	Maximum Daily Operational Emissions, lbs/day					
Source	**ROG**	**CO**	**NOx**	**SOx**	**PM10**	**PM2.5**
Construction Truck Trips	0.01	0.07	0.16	0.00	0.03	0.02
Worker Trips	0.24	3.57	0.31	0.00	0.09	0.04
Total	**0.25**	**3.64**	**0.48**	**0.00**	**0.12**	**0.06**