

APPENDIX F

Air Quality Modeling Results

Appendix F - Emissions Worksheet Index	
No.	Title
Table 1	Phase 3 - NEMDC South - Cutoff Wall Installation
Table 2	Phase 4a - SREL Summary
Table 3	ARNL Reach I: 1-4
Table 4	PGCC&NEMDC South - Waterside
Table 5	PGCC&NEMDC South - Levee Raise
Table 6	PGCC Culvert
Table 7	SREL Reaches 16-20
Table 8	NEMDC North
Table 9	WDC
Table 10	Riego Road
Table 11	NCC - Bridge
Table 12	NCC - South Levee
Table 13	District 1000 Pumping Plants
Table 14	City of Sacramento Pumping Plants
Table 15	Triangle Properties Borrow Site
Table 16	South Fisherman's Lake and W. Lakeside Borrow Site
Table 17	Phase 4b Summary by Element
Table 18	Fix-In-Place Alternative
Table 19a	Fix-In-Place Summary - Sutter County
Table 19b	Fix-In-Place Summary - Sacramento County
Table 19c	Fix-In-Place Annual, Unmitigated Emissions
Table 19d	Fix-In-Place Annual, Mitigated Emissions
Table 20	No Action Alternative - Emissions Summary
Table 21	Conformity Table
Table 22	SMAQMD Offset Mitgation Fee Summary

Table 1: Phase 3 - NEMDC South - Cutoff Wall Installation¹

Unmitigated 2011 Emissions*							
Phase Element	Emissions, Worst-Case (lb/day)			Emissions (tons/year)			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2
NEMDC South Total	31.0	195.0	306.0	1.0	8.0	13.0	581.0
Mitigated 2011 Emissions							
% Reduction	5%	20%	85%	5%	20%	85%	-
TOTAL	29.5	156.0	45.9	1.0	6.4	2.0	-

Notes:

1. Phase 3 NEMDC South could be constructed in 2015 concurrent with Phase 4b
2. All work conducted in Sacramento County

*Emissions data presented as analyzed in Phase 3 EIS/EIR

Table 2: Phase 4a - SREL Summary¹								
Project Element	Emissions (lb/day) - Worst Case				Emissions (tons/yr)			
	ROG	NOX	PM10	CO2	ROG	NOX	PM10	CO2
Total from SREL Reaches 13-15	69.0	409.3	3799.0	-	4.4	25.6	365.2	2896.4
Total from Riverside Canal	21.7	101.0	1645.8	-	1.0	5.4	60.5	693.4
Phase 4a - SREL, Mitigated Emission								
	Emissions (lb/day) - Worst Case				Emissions (tons/yr)			
	5%	20%	85%	-	5%	20%	85%	-
Mitigation Reductions								
Total Mitigated Phase 4a - SREL R:13-15 and Riverside Canal, Sacramento County	86.2	327.4	569.8	-	4.2	20.5	54.8	2896.4
Notes:								
1. 100% of Phase 4a - SREL R:13-15 and 100% of Riverside Canal could be constructed during 2012, overlapping with Phase 4b components constructed during 2012.								
3. All work conducted in Sacramento County								
*Emissions data presented as analyzed in Phase 4a EIS/EIR, August 28, 2009								

Table 3: American River North Levee (ARNL) Reach I: 1-4 - Phase 4b Improvements

Phase 4b American River North Levee (ARNL) Reach I: 1-4 includes slope flattening and seepage remediation
 Work Schedule : May - Nov., 2012 (1, 2, and 3)
 Work Schedule: May-Nov., 2013 (4, 5, and 6)

		Total ARNL Reaches 1-4 length in Phase 4b =		2.3 mi		12144.0 ft						Conversion										
		ARNL Reaches 1-4 length in Sacramento County =		12144.0 ft		100.0%		of the total length				0.00220462 lb/gram		2000 lb/ton								
Qty	Unit	Emission Factor						Emissions (lb/yr)						Input Data								
		ROG	NOX	PM10	PM2.5	CO2	Unit	PM10		PM2.5		CO2	Unit	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day			
								Combustion	Earthmoving	COMB	EM											
[1] Site Preparation																						
Mobile Sources																						
Haul Truck(s)	6	trucks	1.19	15.82	0.62	0.57	1847.96	lb/day	193.3	2563.2	100.4	-	92.4	-	299369.5	lb/yr	-	-	-	4.0	648.00	24.00
Haul Truck(s)	162	trips	11.23	8.02	0.02	0.01	271.22	g/trip ²	4.0	2.9	0.0	-	0.0	-	96.9	lb/yr	Activity Period (days) = 27.0					
Water Truck(s)	1		0.10	1.27	0.05	0.05	163.47	lb/day	2.7	34.3	1.4	-	1.2	-	4413.7	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Scraper(s)	2		0.46	4.36	0.18	0.16	409.54	lb/day	25.1	235.5	9.5	-	8.8	-	22115.4	lb/yr	*Assumes haul load=14 yd ³					
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	23.1	179.9	10.4	-	9.6	-	16586.5	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes					
Crawler Tractor(s)	2		0.48	4.45	0.19	0.17	369.73	lb/day	26.0	240.5	10.0	-	9.2	-	19965.3	lb/yr	Notes:					
Motor Grader(s)	2		0.49	3.79	0.22	0.20	346.97	lb/day	26.4	204.9	11.9	-	10.9	-	18736.6	lb/yr	1. Emission factor represents running exhaust (grams/mile)					
Chippers/Grinder(s)	4		0.58	3.78	0.32	0.30	352.66	lb/day	62.4	407.7	35.0	-	32.2	-	38087.6	lb/yr	2. Emission factor represents start emission rate @ 480 minutes (grams/trip)					
Employee Trips	25	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employee	15.5	19.6	2.7	-	2.6	-	26497.1	lb/yr						
Fugitive Sources																						
Travel on unpaved roads	324	VMT/year	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	290.9	-	27.2	-	lb/yr					
Travel on paved roads	324	VMT/year	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	91.5	-	13.4	-	lb/yr					
Total Emissions (lb/year) =									378.5	3888.4	181.3	382.3	166.9	40.7	445868.5	lb/yr						
Total Emissions (lb/day) =									14.0	144.0	6.7	14.2	6.2	1.5	16513.6	lb/day						
[2] Removal of Landside Structures and Other Facilities																						
Mobile Sources																						
Haul Truck(s)	8	trucks	1.19	15.82	0.62	0.57	1847.96	g/mile ¹	2.0	26.8	1.0	-	1.0	-	3128.9	lb/yr	-	-	-	4.0	768.00	32.00
Haul Truck(s)	192	trips	11.23	8.02	0.02	0.01	271.22	g/trip ²	4.8	3.4	0.01	-	0.01	-	114.80	lb/yr	Activity Period (days) = 24.0					
Excavator(s)	2		0.46	4.36	0.18	0.16	409.54	lb/day	22.3	209.3	8.5	-	7.8	-	19658.1	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Loader(s)	1		0.43	3.33	0.19	0.18	307.16	lb/day	10.3	79.9	4.6	-	4.2	-	7371.8	lb/yr	*Assumes haul load=14 yd ³					
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employee	8.3	10.4	1.4	-	1.4	-	14131.8	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes					
Fugitive Sources																						
Travel on unpaved roads	384	VMT/year	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	344.72	-	32.29	-	lb/yr					
Travel on paved roads	384	VMT/year	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	108.43	-	15.93	-	lb/yr					
Total Emissions (lb/year) =									47.6	329.9	15.6	453.2	14.4	48.2	44405.4	lb/yr						
Total Emissions (lb/day) =									2.0	13.7	0.6	18.9	0.6	2.0	1850.2	lb/day						
[3] Flattening Slope																						
Mobile Sources																						
Haul Truck(s)	10	trucks	1.19	15.82	0.62	0.57	1847.96	g/mile ¹	145.8	1933.4	75.8	-	69.7	-	225819.1	lb/yr	Levee Fill	167,000	11,928.57	4.0	47,714.29	340.82
Haul Truck(s)	14440	trips	11.23	8.02	0.02	0.01	271.22	g/trip ²	357.5	255.2	0.5	-	0.5	-	8634.2	lb/yr	Waste Material	27000	1928.57	4	7,714.29	55.10
Excavator(s)	2		0.42	3.22	0.19	0.18	324.22	lb/day	118.8	902.9	53.8	-	49.5	-	90782.1	lb/yr	Aggregate Base**	6960	497.14	60	29,828.57	213.06
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	119.7	932.6	53.9	-	49.6	-	86004.1	lb/yr	Asphalt Concrete**	1200	85.71	60	5,142.86	36.73
Scraper(s)	2		0.46	4.36	0.18	0.16	409.54	lb/day	130.1	1221.1	49.3	-	45.4	-	114672.3	lb/yr	Total Material =	202,160	14,440	128	90,400	646
Dozer(s)	2		0.46	4.06	0.17	0.16	335.60	lb/day	128.2	1136.4	48.5	-	44.6	-	93967.4	lb/yr	Material	Tons/CY	Tons/day			
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	80.1	503.5	24.0	-	22.0	-	68484.8	lb/yr		1.25	1805.0			
Grader(s)	2		0.49	3.79	0.22	0.20	346.97	lb/day	137.0	1062.4	61.5	-	56.6	-	97152.8	lb/yr	Activity Period (days) = 140.0					
Water Truck(s)	1		0.10	1.27	0.05	0.05	163.47	lb/day	14.0	177.8	7.0	-	6.4	-	22885.8	lb/yr	Haul Truck capacity (CY) = 14.0					
Employee Trips	25	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employee	80.5	101.5	14.0	-	13.5	-	137392.5	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Fugitive Sources																						
Travel on unpaved roads	45200	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	40576.6	-	3800.5	-	lb/yr					
Travel on paved roads	45200	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	12763.4	-	1875.1	-	lb/yr					
Total Emissions (lb/year) =									1,311.7	8,226.9	388.2	63,090.8	357.7	6,888.6	945,795.1	lb/yr						
Total Emissions (lb/day) =									9.4	58.8	2.8	450.6	2.6	49.2	6,755.7	lb/day						
[4] Cutoff Wall Construction																						
Mobile Sources																						
Haul Truck(s)	2	trucks	1.19	15.82	0.62	0.57	1847.96	g/mile ¹	1.3	16.7	0.7	-	0.6	-	1955.5	lb/yr	-	-	-	4.0	480.00	8.00
Haul Truck(s)	120	trips	11.23	8.02	0.02	0.01	271.22	g/trip ²	3.0	2.1	0.0	-	0.0	-	71.8	lb/yr	Activity Period (days) = 60.0					
Loader(s)	6		0.43	3.33	0.19	0.18	307.16	lb/day	153.9	1199.1	69.3	-	63.7	-	110576.8	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Dozer(s)	12		0.46	4.06	0.17	0.16	335.60	lb/day	329.7	2922.2	124.6	-	114.7	-	241630.4	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes					
Pallet Loader(s) [Forklifts]	6		0.66	4.01	0.37	0.34	341.29	lb/day	239.1	1442.6	133.2	-	122.6	-	122863.1	lb/yr	Notes:					
Generator(s)	6		0.29	3.78	0.11	0.10	420.92	lb/day	104.2	1361.4	41.0	-	37.7	-	151531.1	lb/yr	1. Emission factor represents running exhaust (grams/mile)					
Pump(s)	6		0.76	4.91	0.40	0.36	420.92	lb/day	274.5	1768.2	142.4	-	131.0	-	151531.1	lb/yr	2. Emission factor represents start emission rate @ 480 minutes (grams/trip)					
Pickup(s)	6		0.02	0.03	0.00	0.00	39.26	lb/day	8.3	10.4	1.4	-	1.4	-	14131.8	lb/yr						
Excavator(s)	2		0.42	3.22	0.19	0.18	324.22	lb/day	50.9	387.0	23.0	-	21.2	-	38906.6	lb/yr						

Table 3: American River North Levee (ARNL) Reach I: 1-4 - Phase 4b Improvements

Phase 4b American River North Levee (ARNL) Reach I: 1-4 includes slope flattening and seepage remediation																	
Deep Soil Mix Rig	6		0.20	2.34	0.08	0.08	426.61	lb/day	73.5	841.9	30.3	-	27.9	-	153578.7	lb/yr	
Employee Trips	120	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employee	165.6	208.8	28.8	-	27.8	-	282636.0	lb/yr	
Fugitive Sources																	
Travel on unpaved roads	240	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	215.5	-	20.2	-	lb/yr
Travel on paved roads	240	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	67.8	-	10.0	-	lb/yr
Material Handling																	
Bulldozing	8	hrs/day	-	-	0.75	0.11	-	lb/hr	-	-	-	-	361.3	-	50.6	-	lb/yr
Total Emissions (lb/year) =									1403.9	10160.3	594.7	644.5	548.5	80.7	1269413.0	lb/yr	
Total Emissions (lb/day) =									23.4	169.3	9.9	10.7	9.1	1.3	21156.9	lb/day	
[5] Reconstruction of Garden Highway at four intersections																	
Mobile Sources																	
Haul Truck(s)	12	trucks	1.193	15.822	0.620	0.570	1847.960	g/mile ¹	3.41	45.21	1.77	-	1.63	-	5279.98	lb/yr	
Haul Truck(s)	324	trips	10.736	0.000	0.015	0.015	209.040	g/trip ²	7.67	0.00	0.01	-	0.01	-	149.32	lb/yr	
Backhoe(s)	4		0.184	1.194	0.046	0.043	312.846	lb/day	19.88	128.91	4.99	-	4.59	-	33787.35	lb/yr	
Compactor(s)	4		0.285	1.783	0.071	0.066	244.589	lb/day	30.75	192.56	7.69	-	7.07	-	26415.57	lb/yr	
Paver(s)	2		0.749	4.481	0.396	0.365	352.663	lb/day	40.46	241.97	21.41	-	19.69	-	19043.78	lb/yr	
Off-Highway Truck(s)	2		0.269	2.319	0.084	0.077	324.222	lb/day	14.55	125.24	4.54	-	4.17	-	17507.98	lb/yr	
Truck-Mounted Auger(s)	2		0.269	2.319	0.084	0.077	324.222	lb/day	14.55	125.24	4.54	-	4.17	-	17507.98	lb/yr	
Employee Trips	15	employees	0.023	0.029	0.004	0.004	39.255	lb/day/employee	9.32	11.75	1.62	-	1.56	-	15898.28	lb/yr	
Fugitive Sources																	
Travel on unpaved roads	648	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	581.72	-	54.49	-	lb/yr
Travel on paved roads	648	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	183.0	-	26.9	-	lb/yr
Total Emissions (lb/year) =									140.6	870.9	46.6	764.7	42.9	81.4	135590.2	lb/yr	
Total Emissions (lb/day) =									5.2	32.3	1.7	28.3	1.6	3.0	5021.9	lb/day	
[6] Site Restoration/Demobilization																	
Mobile Sources																	
Haul Truck(s)	3	trucks	1.19	15.82	0.62	0.57	1847.96	g/mile ¹	1.1	14.2	0.6	-	0.5	-	1662.2	lb/yr	
Haul Truck(s)	102	trips	10.74	0.00	0.02	0.01	209.04	g/trip ²	2.4	0.0	0.0	-	0.0	-	47.0	lb/yr	
Off-Highway Truck(s)	3		0.27	2.32	0.08	0.08	324.22	lb/day	27.5	236.6	8.6	-	7.9	-	33070.6	lb/yr	
Water Truck(s)	3		0.10	1.27	0.05	0.05	163.47	lb/day	10.2	129.5	5.1	-	4.7	-	16673.9	lb/yr	
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employee	11.7	14.8	2.0	-	2.0	-	20020.1	lb/yr	
Fugitive Sources																	
Travel on unpaved roads	204	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	183.1	-	17.2	-	lb/yr
Travel on paved roads	204	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	57.6	-	8.5	-	lb/yr
Total Emissions (lb/year) =									52.9	395.1	16.3	240.7	15.1	25.6	71473.8	lb/yr	
Total Emissions (lb/day) =									1.6	11.6	0.5	7.1	0.4	0.8	2102.2	lb/day	
Summary - ARNL																	
									ROG	NOX	PM10		PM2.5		CO2		
											Combustion	Earthmoving	Combustion	Earthmoving			
											0.9	6.2	0.3	32.0	0.3	3.5	718.0
											14.0	144.0	6.7	450.6	6.2	49.2	16513.6
											0.8	5.7	0.3	0.8	0.3	0.1	738.2
											23.4	169.3	9.9	28.3	3.0	3.0	21156.9

*These calculations represent worst-case emissions from construction activities associated with American River North Levee Reaches 1-4 work

Year	Group	Phase	Emissions (lb/day)						
			ROG	NOx	PM10 Combustion	PM10 Earthmoving	PM2.5 Combustion	PM2.5 Earthmoving	CO2
2012	I	1	14.0	144.0	6.7	14.2	6.2	1.5	16513.6
	II	2	2.0	13.7	0.6	18.9	0.6	2.0	1850.2
	III	3	9.4	58.8	2.8	450.6	2.6	49.2	6755.7
		Worst-case lb/day	14.0	144.0	6.7	450.6	6.2	49.2	16513.6
2013	IV	4	23.4	169.3	9.9	10.7	9.1	1.3	21156.9
	V	5	5.2	32.3	1.7	28.3	1.6	3.0	5021.9
	VI	6	1.6	11.6	0.5	7.1	0.4	0.8	2102.2
		Worst-case lb/day	23.4	169.3	9.9	28.3	9.1	3.0	21156.9

Table 4: Pleasant Grove Creek Canal (PGCC) and Natomas East Main Drainage Canal South Reaches E and H (NEMDC South) - Waterside Improvements - Phase 4b Improvements

Project Information

Phase 4b PGCC and NEMDC Canal South Reaches E and H (NEMDC South) Waterside Improvements includes levee raising and slope flattening
 PGCC/NEMDC South - Waterside Improvements Work Schedule: May-Nov 2015

total PGCC/NEMDC South - Waterside Improvements length in Phase 4b	0.8	mi
	4224.0	ft
PGCC/NEMDC South length in Sutter County =	1200.0	ft
PGCC/NEMDC South length in Sacramento County =	2900.0	ft
	28.4%	of the total length
	68.7%	of the total length

0.002204623 lb/gram
2000 lb/ton

Emission Factor	ROG	NOX	PM10	PM2.5	CO2	Unit	Emissions (lb/yr)						Input Data										
							PM10		PM2.5		CO2	Unit	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day					
							COMB	EM	COMB	EM													
[1] Erosion Repair and Rock Slope Protection Installation																							
Mobile Sources																							
Haul Truck(s)	15	trucks	1.193	15.82	0.62	0.57	1847.96	g/mile ³	3.72	49.37	1.93	-	1.78	-	5766.15	lb/yr	Rock slope protection	4,246.00	354	4.00	1,415.33	8	
Haul Truck(s)	354	trips	11.23	8.02	0.02	0.01	271.22	g/trip ²	8.76	6.25	0.01	-	0.01	-	211.57	lb/yr	Material	1.25	252.7				
Pick-up Truck(s)	2		0.02	0.03	0.00	0.00	39.26	lb/day	1.0	1.2	0.2	-	0.2	-	1648.7	lb/yr							
Water Truck(s)	2		0.10	1.27	0.05	0.05	163.47	lb/day	4.2	53.3	2.1	-	1.9	-	6865.7	lb/yr							
Excavator(s)	3		0.42	3.22	0.19	0.18	324.22	lb/day	26.7	203.2	12.1	-	11.1	-	20426.0	lb/yr							
Loader(s)	4		0.43	3.33	0.19	0.18	307.16	lb/day	35.9	279.8	16.2	-	14.9	-	25801.2	lb/yr							
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employ	7.2	9.1	1.3	-	1.2	-	12365.3	lb/yr							
Fugitive Sources																							
Travel on unpaved roads	708	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	635.3	-	59.5	-	lb/yr						
Travel on paved roads	708	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	199.8	-	29.4	-	lb/yr						
Total Emissions (lb/year) =									87.5	602.3	33.7	835.1	31.1	88.9	73084.7	lb/yr							
Total Emissions (lb/day) =									4.17	28.68	1.61	39.77	1.48	4.23	3480.22	lb/day							
[2] Beaver Protection Wall Installation (Independent of No. 1) - Work conducted in 10-hour shifts, 6 days per week																							
Mobile Sources																							
Water Truck	1		0.13	1.59	0.06	0.06	204.34	lb/day	10.00	127.00	5.00	-	4.60	-	16347.00	lb/yr							
Backhoe(s)	3		0.24	1.60	0.07	0.06	391.06	lb/day	58.08	383.10	16.41	-	15.10	-	93853.70	lb/yr							
Loader(s)	2		0.53	4.16	0.24	0.22	383.95	lb/day	85.48	666.18	38.48	-	35.40	-	61431.53	lb/yr							
Light-Duty Crane	1		0.31	3.01	0.12	0.11	305.74	lb/day	24.72	240.61	9.29	-	8.55	-	24458.85	lb/yr							
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employ	27.60	34.80	4.80	-	4.63	-	47106.00	lb/yr							
Fugitive Sources																							
Travel on unpaved roads	172.0	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	154.4	-	14.5	-	lb/yr						
Travel on paved roads	172.0	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	48.6	-	7.1	-	lb/yr						
Total Emissions (lb/year) =									205.9	1451.7	74.0	203.0	68.3	21.6	243197.1	lb/yr							
Total Emissions (lb/day) =									2.6	18.1	0.9	2.5	0.9	0.3	3040.0	lb/day							
[3] NEMDC Low Flow Channel Relocation (Independent of No. 1 and 2) - Work conducted in 10-hr shifts, 6 days per week																							
Mobile Sources																							
Excavator(s)	1		0.47	3.48	0.21	0.19	405.28	lb/day	14.00	104.36	6.18	-	5.69	-	12158.32	lb/yr							
Vibratory Roller	1		0.71	4.47	0.39	0.36	398.17	lb/day	21.40	134.13	11.66	-	10.73	-	11945.03	lb/yr							
Loader(s)	2		0.48	3.67	0.21	0.19	383.95	lb/day	28.52	220.01	12.68	-	11.66	-	23036.82	lb/yr							
Employee Trips	12	employees	0.02	0.03	0.00	0.00	39.26	lb/day/employ	8.28	10.44	1.44	-	1.39	-	14131.80	lb/yr							
Total Emissions (lb/year) =									72.2	468.9	32.0	0.0	29.5	0.0	61272.0	lb/yr							
Total Emissions (lb/day) =									2.4	15.6	1.1	0.0	1.0	0.0	2042.4	lb/day							

Summary - PGCC/NEMDC South Waterside Improvements							ROG	NOx	PM10		PM2.5		CO2
									combustion	arthmov	combustion	arthmov	
2015 Total from PGCC/NEMDC South - Waterside Improvements (tons/year) =							0.2	1.3	0.1	0.5	0.1	0.1	188.8
2015 Total from PGCC/NEMDC South - Waterside Improvements (lb/day) - Worst Case Day =							4.2	28.7	1.6	39.8	1.5	4.2	3480.2
Emissions in Sacramento County (tons/year) =							68.7%	0.13	0.87	0.05	0.36	0.04	129.61
Emissions in Sacramento County (lb/day)- Worst Case =							68.7%	2.9	19.7	1.1	27.3	1.0	2389.4
Emissions in Sutter County (tons/year) =							28.4%	0.1	0.4	0.0	0.1	0.0	53.6
Emissions in Sutter County (lb/day)- Worst Case =							28.4%	1.2	8.1	0.5	11.3	0.4	988.7

*These calculations represent worst-case emissions from construction activities associated with NEMDC South - Waterside work

Year	Group	Phase	Emissions (lb/day)						
			ROG	NOx	PM10		PM2.5		CO2
					combustion	arthmov	combustion	arthmov	
2015	1	1	4.2	28.7	1.6	39.8	1.5	4.2	3480.2
	2	2	2.6	18.1	0.9	2.5	0.9	0.3	3040.0
	3	3	2.4	15.6	1.1	0.0	1.0	0.0	2042.4
	Worst-case lb/day			4.2	28.7	1.6	39.8	1.5	4.2

Table 6: Pleasant Grove Creek Canal (PGCC) Culvert Remediation - Phase 4b Improvements

Project Information

Phase 4b PGCC Culvert Remediation includes culvert upgrades or removal
PGCC Culvert Work Schedule: May-Nov 2014

Total PGCC length in Phase 4b	3.3	mi
	17424	ft
PGCC length in Sutter County =	17424	100.0% of the total length

Conversion	
0.002204623	lb/gram
2000	lb/ton

	Qty	Unit	Emission Factor								Emissions (lb/yr)								Input Data														
			ROG		NOX		PM10		PM2.5		CO2		Unit		ROG		NOX		PM10		PM2.5		CO2		Unit								
			COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM	COMB	EM							
[1] Culvert Removal																																	
Mobile Sources																																	
Haul Truck(s)	2	trucks	1.19	15.82	0.62	0.57	1847.96	g/mile ¹	0.32	4.19	0.16	-	0.15	-	488.89	lb/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Haul Truck(s)	30	trips	10.74	0.00	0.02	0.01	209.04	g/trip ²	0.71	0.00	0.00	-	0.00	-	13.83	lb/yr	Activity Period (days) = 15.0																
Pick-up Truck(s)	5		0.02	0.03	0.00	0.00	39.26	lb/day	1.73	2.18	0.30	-	0.29	-	2944.13	lb/yr	*Assumes haul load is approximately 4 miles roundtrip																
Water Truck(s)	1		0.10	1.27	0.05	0.05	163.47	lb/day	1.50	19.05	0.75	-	0.69	-	2452.05	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes																
Loader(s)	2		0.38	2.93	0.17	0.16	307.16	lb/day	11.41	88.00	5.07	-	4.66	-	9214.73	lb/yr	Notes:																
Rollers	2		0.57	3.58	0.31	0.29	318.53	lb/day	17.12	107.31	9.33	-	8.58	-	9556.02	lb/yr	1. Emission factor represents running exhaust (grams/mile)																
Excavator(s)	2		0.37	2.78	0.16	0.15	324.22	lb/day	11.20	83.49	4.94	-	4.55	-	9726.66	lb/yr	2. Emission factor represents start emission rate @ 480 minutes (grams/trip)																
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	5.18	6.53	0.90	-	0.87	-	8832.38	lb/yr																	
Fugitive Sources																																	
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	53.9	-	5.0	-	lb/yr																	
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	16.9	-	2.5	-	lb/yr																	
Total Emissions (lb/year) =																49.2	310.7	21.5	70.8	19.8	7.5	43228.7	lb/yr										
Total Emissions (lb/day) =																3.28	20.72	1.43	4.72	1.32	0.50	2881.91	lb/day										
[2] Detention Basin Area Stripping																																	
Mobile Sources																																	
Water Truck	2		0.10	1.27	0.05	0.05	163.47	lb/day	1.0	12.7	0.5	-	0.5	-	1634.7	lb/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Scraper(s)	4		0.42	3.84	0.15	0.14	409.54	lb/day	8.5	76.9	3.0	-	2.8	-	8190.9	lb/yr	Activity Period (days) = 5.0																
Loader(s)	2		0.38	2.93	0.17	0.16	307.16	lb/day	3.8	29.3	1.7	-	1.6	-	3071.6	lb/yr	*Assumes scrapers travel 100% on unpaved road																
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	1.7	2.2	0.3	-	0.3	-	2944.1	lb/yr																	
Fugitive Sources																																	
Travel on unpaved roads	20.0	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	18.0	-	1.7	-	lb/yr																	
Travel on paved roads	-	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	-	-	-	lb/yr																	
Total Emissions (lb/year) =																15.0	121.1	5.5	18.0	5.1	1.7	15841.3	lb/yr										
Total Emissions (lb/day) =																3.0	24.2	1.1	3.6	1.0	0.3	3168.3	lb/day										
[3] Detention Basin Excavation (follows no. 2) - Work conducted in 10-hr shifts, 6 days per week																																	
Mobile Sources																																	
Scraper(s)	15		0.53	4.80	0.19	0.17	511.93	lb/day	238.73	2161.46	85.22	-	78.40	-	230368.39	lb/yr	Excavation	4,750.00	339.29	4.00	1357.14	45.24											
Water Truck(s)	2		0.13	1.59	0.06	0.06	204.34	lb/day	7.50	95.25	3.75	-	3.45	-	12260.25	lb/yr	Backfill	5,875.00	419.64	4.00	1678.57	55.95											
Motor Grader(s)	5		0.55	4.18	0.24	0.22	433.72	lb/day	81.83	627.56	36.21	-	33.31	-	65057.72	lb/yr	Material	Tons/CY	Tons/day														
Employee Trips	40	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	27.60	34.80	4.80	-	4.63	-	47106.00	lb/yr		1.25	442.7														
Fugitive Sources																																	
Travel on unpaved roads	1518	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	1362.6	-	127.6	-	lb/yr	Activity Period (days) = 30.0																
Travel on paved roads	1518	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	428.6	-	63.0	-	lb/yr	Haul Truck capacity (CY) = 14.0																
Material Handling																																	
Scraper Unloading			-	-	0.03	0.00	-	lb/ton	-	-	398.4	-	55.8	-	lb/yr	*Assumes haul load is approximately 4 miles roundtrip																	
Total Emissions (lb/year) =																355.7	2919.1	528.4	1791.2	175.6	190.6	354792.4	lb/yr	*Assumes that material hauling is along 50% paved and 50% unpaved haul routes									
Total Emissions (lb/day) =																11.9	97.3	17.6	59.7	5.9	6.4	11826.4	lb/day										
[4] Demobilization/cleanup (follows no. 3)																																	
Mobile Sources																																	
Haul Truck(s)	2	trucks	1.19	15.82	0.62	0.57	1847.96	g/mile ¹	0.3	3.3	0.1	-	0.1	-	391.1	lb/yr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Haul Truck(s)	24	trips	10.18	0.00	0.01	0.01	199.87	g/trip ²	0.54	0.00	0.00	-	0.00	-	10.58	lb/yr	Activity Period (days) = 12.0																
Water Truck(s)	2		0.10	1.27	0.05	0.05	163.47	lb/day	2.4	30.5	1.2	-	1.1	-	3923.3	lb/yr	*Assumes haul load is approximately 4 miles roundtrip																
Off-Highway Truck(s)	2		0.26	2.13	0.08	0.07	324.22	lb/day	6.20	51.10	1.81	-	1.66	-	7781.33	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes																
Employee Trips	25	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	6.9	8.7	1.2	-	1.2	-	11776.5	lb/yr	Notes:																
Fugitive Sources																																	
Travel on unpaved roads	48	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	43.1	-	4.0	-	lb/yr	1. Emission factor represents running exhaust (grams/mile)																
Travel on paved roads	48	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	13.6	-	2.0	-	lb/yr	2. Emission factor represents start emission rate @ 480 minutes (grams/trip)																
Total Emissions (lb/year) =																16.3	93.6	4.3	56.6	4.0	6.0	23882.8	lb/yr										
Total Emissions (lb/day) =																1.4	7.8	0.4	4.7	0.3	0.5	1990.2	lb/day										

Summary - PGCC Culvert Remediation	ROG	NOx	PM10	PM2.5	CO2
2014 Total PGCC Culverts Emissions (tons/year) =	0.2	1.7	0.3	1.0	218.9
2014 Total PGCC Culverts Emissions, Worst Case (lb/day) =	11.9	97.3	17.6	59.7	11826.4

Table 6: Pleasant Grove Creek Canal (PGCC) Culvert Remediation - Phase 4b Improvements

Project Information

*These calculations represent worst-case emissions from construction activities associated with PGCC Culvert Remediation work

Year	Group	Phase	Emissions (lb/day)						
			ROG	NOx	PM10		PM2.5		CO2
					COMB	EM	COMB	EM	
2014	I	1	3.3	20.7	1.4	4.7	1.3	0.5	2881.9
		2	3.0	24.2	1.1	3.6	1.0	0.3	3168.3
		Total	6.3	44.9	2.5	8.3	2.3	0.8	6050.2
	II	3	11.9	97.3	17.6	59.7	5.9	6.4	11826.4
		Total	11.9	97.3	17.6	59.7	5.9	6.4	11826.4
	III	4	1.4	7.8	0.4	4.7	0.3	0.5	1990.2
		Total	1.4	7.8	0.4	4.7	0.3	0.5	1990.2
	Worst-case lb/day			11.9	97.3	17.6	59.7	5.9	6.4

Table 7: Sacramento River East Levee Reaches (SREL) 16-20 - Phase 4b Improvements

Phase 4b Sacramento River East Levee (SREL) Reaches 16-20 includes levee widening, rehabilitation, and seepage remediation
 SREL Reaches 16-20 Work Schedule: May - Nov. 2013 (50%)
 SREL Reaches 16-20 Work Schedule: May - Nov. 2014 (50%)

Total SREL Reaches 16-20 length in Phase 4b =	3.4 mi	
	17688.0 ft	
SREL Reaches 16-20 length in Sacramento County =	17688.0 ft	100.0% of the total length

Conversion	
	0.002204623 lb/gram
	2000 lb/ton

	Qty	Unit	Emission Factor					Emissions (lb/yr)							Input Data							
			ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10		CO2	Unit	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day		
											COMB	EM	COMB	EM								
[1] Site Preparation (concurrent with 2)																						
Mobile Sources																						
Haul Truck(s)	10	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile ³	2.84	37.67	1.48	-	1.36	-	4,399.98	lb/yr	-	-	-	4.0	1080	40
Haul Truck(s)	270	trips	10.74	-	0.02	0.01	209.04	g/trip ²	6.39	-	0.01	-	0.01	-	124.43	lb/yr	-	-	-	Activity Period (days) = 27		
Water Truck(s)	2		0.10	1.27	0.05	0.05	163.47	lb/day	5.40	68.58	2.70	-	2.48	-	8,827.38	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Scrapper(s)	6		0.42	3.84	0.15	0.14	409.54	lb/day	68.75	622.50	24.54	-	22.58	-	66,346.10	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes					
Loader(s)	2		0.38	2.93	0.17	0.16	307.16	lb/day	20.53	158.40	9.13	-	8.40	-	16,586.51	lb/yr	Notes:					
Grader(s)	2		0.44	3.35	0.19	0.18	346.97	lb/day	23.57	180.74	10.43	-	9.59	-	18,736.62	lb/yr	1. Emission factor represents running exhaust (grams/mile)					
Chipper(s)	4		0.56	4.34	0.25	0.23	443.67	lb/day	59.95	468.91	27.16	-	24.99	-	47,916.60	lb/yr	2. Emission factor represents start emission rate @ 480 minutes (grams/trip)					
Crawler Tractor(s)	2		0.18	1.19	0.05	0.04	312.85	lb/day	9.94	64.45	2.49	-	2.30	-	16,893.67	lb/yr						
Employee Trips	30	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	18.63	23.49	3.24	-	3.12	-	31,796.55	lb/yr						
Fugitive Sources																						
Travel on unpaved road	540	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	484.76	-	45.40	-	lb/yr					
Travel on paved road	540	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	152.48	-	22.40	-	lb/yr					
Total Emissions (lb/year) =																						
Total Emissions (lb/day) =																						
[2] Removal of Landside Structures and Other Facilities (concurrent with 1)																						
Mobile Sources																						
Haul Truck(s)	24	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile ³	6.06	80.37	3.15	-	2.90	-	9,386.62	lb/yr	-	-	-	4.0	2304	96
Haul Truck(s)	576	trips	10.74	-	0.02	0.01	209.04	g/trip ²	13.63	-	0.02	-	0.02	-	265.45	lb/yr	-	-	-	Activity Period (days) = 24		
Excavator(s)	2		0.37	2.78	0.16	0.15	324.22	lb/day	17.92	133.58	7.91	-	7.28	-	15,562.65	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Loader(s)	1		0.38	2.93	0.17	0.16	307.16	lb/day	9.12	70.40	4.06	-	3.73	-	7,371.78	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes					
Employee Trips	30	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	16.56	20.88	2.88	-	2.78	-	28,263.60	lb/yr	Notes:					
Fugitive Sources																						
Travel on unpaved road	1152	VMT/year	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	1,034.17	-	96.86	-	lb/yr					
Travel on paved road	1152	VMT/year	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	325.30	-	47.79	-	lb/yr					
Total Emissions (lb/year) =																						
Total Emissions (lb/day) =																						
[3] Construction of Adjacent Levee Raise & Seepage Berms - Reaches 16-20																						
Mobile Sources																						
Haul Truck(s)	50	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile ³	967.32	12,828.93	502.71	-	462.50	-	1,498,379.27	lb/yr	Levee Fill	505000	36071	4.0	144286	1031
Haul Truck(s)	75600	trips	10.74	-	0.02	0.01	209.04	g/trip ²	1,789.36	-	2.50	-	2.44	-	34,840.59	lb/yr	Seepage Berm Fill	663000	47357	4.0	189429	1353
Water Truck(s)	2		0.10	1.27	0.05	0.05	163.47	lb/day	28.00	356.60	14.00	-	12.88	-	45,771.60	lb/yr	**Aggregate	15900	1136	30.0	34071	243
Scrapper(s)	5		0.42	3.84	0.15	0.14	409.54	lb/day	297.08	2,689.82	106.05	-	97.57	-	286,680.66	lb/yr	Material	Tons/CY	R 16-20 Tons/day	367786		
Loader(s)	5		0.38	2.93	0.17	0.16	307.16	lb/day	266.14	2,053.38	118.30	-	108.84	-	215,010.32	lb/yr						
Bulldozer(s)	5		0.42	3.65	0.15	0.14	335.60	lb/day	296.17	2,554.44	107.10	-	98.53	-	234,918.74	lb/yr	Reaches 16-19A*					
Compactor(s)	2		0.28	1.78	0.07	0.07	244.59	lb/day	79.72	499.24	19.94	-	18.34	-	68,484.81	lb/yr	Activity Period (days) =			140.0		
Grader(s)	2		0.44	3.35	0.19	0.18	346.97	lb/day	122.19	937.16	54.07	-	49.74	-	97,152.86	lb/yr	Haul Truck capacity (CY) =			14.0		
Excavator(s)	5		0.37	2.78	0.16	0.15	324.22	lb/day	261.31	1,948.10	115.36	-	106.13	-	226,955.33	lb/yr	Truck Trips (trips/day) =			540		
Employee Trips	60	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	193.20	243.60	33.60	-	32.39	-	329,742.00	lb/yr	*Assumes quantity of material is based on given # of trips per day times haul capacity times activity period (540 trips/day*14 cy*140 days); total fill material for Reaches 16-20 = 1,168,000 cy					
Travel on unpaved road	183893	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	165,082.96	-	15,462.20	-	lb/yr	*Assumes haul load is approximately 4 miles roundtrip				
Travel on paved road	183893	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	51,926.85	-	7,628.78	-	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes				
Material Handling																						
Scrapper Unloading			-	-	0.03	0.00	-	lb/ton	-	-	-	-	44,396.25	-	6,215.48	-	lb/yr	*Date provided by HDR One Company, Inc.				
Truck Unloading			-	-	0.01	0.00	-	lb/ton	-	-	-	-	7,769.34	-	196.82	-	lb/yr	**Commercial Source; approximately 60 miles round trip				
Bulldozing	8	hrs/day	-	-	0.75	0.11	-	lb/hr	-	-	-	-	843.09	-	118.03	-	lb/yr	**Assumes 50% of aggregate material hauled in 16-19A and 50% hauled in 19B-20				
Total Emissions (lb/year) =																						
Total Emissions (lb/day) =																						
[4] Cutoff Wall Construction (24 hours per day day, 7 days per week)																						
Mobile Sources																						
Haul Truck(s)	8	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile ³	5.05	66.97	2.62	-	2.41	-	7,822.19	lb/yr	-	-	-	4.0	1920	32
Haul Truck(s)	480	trips	10.74	-	0.02	0.01	209.04	g/trip ²	11.36	-	0.02	-	0.02	-	221.21	lb/yr	Activity Period (days) = 60.0					
Loader(s)	10		0.51	8.80	0.51	0.47	921.47	lb/day	684.36	5,280.12	304.20	-	279.86	-	552,883.68	lb/yr	Haul Truck capacity (CY) = 14.0					
Bulldozer(s)	20		1.27	10.95	0.46	0.42	1,006.79	lb/day	1,523.16	13,137.12	550.80	-	506.74	-	1,208,153.52	lb/yr	*Assumes haul load is approximately 4 miles roundtrip					
Pallet Loader(s) [Forklifts]	10		1.71	10.55	0.96	0.89	1,023.86	lb/day	1,023.84	6,327.72	577.26	-	531.08	-	614,315.16	lb/yr	*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes					
Generator(s)	10		0.73	9.76	0.28	0.26	1,262.76	lb/day	439.56	5,853.60	167.76	-	154.34	-	757,655.28	lb/yr	Notes:					
Pump(s)	10		1.97	13.08	1.06	0.97	1,262.76	lb/day	1,179.36	7,847.82	634.32	-	583.57	-	757,655.46	lb/yr	1. Emission factor represents running exhaust (grams/mile)					
Pickup(s)	8		0.03	0.04	0.01	0.01	68.88	lb/day	16.56	20.88	2.88	-	2.78	-	28,263.60	lb/yr	2. Emission factor represents start emission rate @ 480 minutes (grams/trip)					

Table 7: Sacramento River East Levee Reaches (SREL) 16-20 - Phase 4b Improvements

Phase 4b Sacramento River East Levee (SREL) Reaches 16-20 includes levee widening, rehabilitation, and seepage remediation																	
Excavator(s)	6		0.37	8.35	0.49	0.45	972.67	lb/day	134.99	3,005.64	177.98	-	163.75	-	350,159.65	lb/yr	
Deep Soil Mix Rigs	10		0.19	5.40	0.18	0.16	1,279.82	lb/day	111.18	3,240.36	107.46	-	98.86	-	767,894.22	lb/yr	
Employee Trips	120	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	165.60	208.80	28.80	-	27.76	-	282,636.00	lb/yr	
Fugitive Sources																	
Travel on unpaved roads	960	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	861.80	-	80.72	-	lb/yr
Travel on paved roads	960	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	271.08	-	39.83	-	lb/yr
Material Handling																	
Bulldozing	24	hrs/day	-	-	0.75	0.11	-	lb/day	-	-	-	-	1,083.98	-	151.76	-	lb/yr
Total Emissions (lb/year) =																	
Total Emissions (lb/day) =																	

3. Pickup truck use is assumed to be half of the work day (~12 hours of use); emission factor times 1.5 to represent 12 hours of operation/day

[5] Reconstruct Garden Hwy at one intersection (concurrent with 5 and 6)																	
Mobile Sources																	
Haul Truck(s)	3	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile	0.9	11.3	0.4	-	0.4	-	1,320.0	lb/yr	
Haul Truck(s)	81	trucks	10.74	0.00	0.02	0.01	209.04	g/trip	1.9	0.0	0.0	-	0.0	-	37.3	lb/yr	
Backhoe(s)	1		0.18	1.19	0.05	0.04	312.85	lb/day	5.0	32.2	1.2	-	1.1	-	8446.8	lb/yr	
Smooth Drum Compactor(s)	1		0.28	1.78	0.07	0.07	244.59	lb/day	7.7	48.1	1.9	-	1.8	-	6603.9	lb/yr	
Off-Highway Truck(s)	1		0.27	2.32	0.08	0.08	324.22	g/mile	0.2	1.7	0.1	-	0.1	-	231.6	lb/yr	
Truck Mounter Auger(s)	1		0.27	2.32	0.08	0.08	324.22	lb/day	7.3	62.6	2.3	-	2.1	-	8754.0	lb/yr	
Paver(s)	1		0.75	4.48	0.40	0.36	352.66	lb/day	20.2	121.0	10.7	-	9.8	-	9521.9	lb/yr	
Employee Trips	60	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	37.3	47.0	6.5	-	6.2	-	63593.1	lb/yr	
Fugitive Sources																	
Travel on unpaved roads	162	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	145.4	-	13.6	-	lb/yr
Travel on paved roads	162	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	45.7	-	6.7	-	lb/yr
Total Emissions (lb/year) =																	
Total Emissions (lb/day) =																	

Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
-	-	-	4.0	324	12
Activity Period (days) = 27					

*Assumes haul load is approximately 4 miles roundtrip
 *Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes
 Notes:
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)

[6] Site Restoration/Demobilization																	
Mobile Sources																	
Haul Truck(s)	2	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile	0.72	9.49	0.37	-	0.34	-	1,108.14	lb/yr	
Haul Truck(s)	68	trucks	10.74	-	0.02	0.01	209.04	g/trip	1.61	-	0.00	-	0.00	-	31.34	lb/yr	
Off-Highway Truck(s)	3		0.27	2.32	0.08	0.08	324.22	lb/day	27.48	236.57	8.57	-	7.88	-	33,070.63	lb/yr	
Water Truck(s)	3		0.10	1.27	0.05	0.05	163.47	lb/day	10.20	129.54	5.10	-	4.69	-	16,673.94	lb/yr	
Employee Trips	60	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	46.92	59.16	8.16	-	7.87	-	80,080.20	lb/yr	
Fugitive Sources																	
Travel on unpaved roads	136	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	122.09	-	11.44	-	lb/yr
Travel on paved roads	136	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	38.40	-	5.64	-	lb/yr
Total Emissions (lb/year) =																	
Total Emissions (lb/day) =																	

Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
-	-	-	4.0	272	8
Activity Period (days) = 34					

*Assumes haul load is approximately 4 miles roundtrip
 *Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes
 Notes:
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)

Summary - SREL Reaches 16-20									
		ROG	NOX	PM10		PM2.5		CO2	
		COMB	EM	COMB	EM	COMB	EM		
Total from SREL Reaches 16-20 (tons/year) =		5.02	35.89	1.89	137.29	1.74	15.07	4433.77	
Total from SREL Reaches 16-20 Worst-Case Day (lb/day) =		88.2	749.8	42.6	1928.7	39.2	211.6	88794.3	
2013 Total from SREL Reaches 16-20 (tons/year) =		50.0%	2.5	17.9	0.9	68.6	0.9	7.5	2216.9
2013 Total from SREL Reaches 16-20 Worst-Case Day (lb/day) =		50.0%	44.1	374.9	21.3	964.4	19.6	105.8	44397.2
2014 Total from SREL Reaches 16-20 (tons/year) =		50.0%	2.5	17.9	0.9	68.6	0.9	7.5	2216.9
2014 Total from SREL Reaches 16-20 Worst-Case Day (lb/day) =		50.0%	44.1	374.9	21.3	964.4	19.6	105.8	44397.2

*These calculations represent worst-case emissions from construction activities associated with Sacramento East River Levee work

Year	Group	Phase	Emissions (lb/day)						CO2
			ROG	NOx	PM10		PM2.5		
					COMB	EM	COMB	EM	
2013-14-SREL Reaches 16-20	I	1	8.0	60.2	3.0	23.6	2.8	2.5	7838.1
		2	2.6	12.7	0.8	56.6	0.7	6.0	2535.4
		Total	10.6	72.9	3.8	80.2	3.5	8.5	10373.5
	II	3a	30.7	172.2	7.7	1928.7	7.1	211.6	21699.5
		Total	30.7	172.2	7.7	1928.7	7.1	211.6	21699.5
	III	4	88.2	749.8	42.6	36.9	39.2	4.5	88794.3
		Total	88.2	749.8	42.6	36.9	39.2	4.5	88794.3
	IV	5	3.0	12.0	0.9	7.1	0.8	0.8	3648.5
		6	2.6	12.8	0.7	4.7	0.6	0.5	3851.9
		Total	5.5	24.8	1.5	11.8	1.4	1.3	7500.4
Worst-case lb/day =			88.2	749.8	42.6	1928.7	39.2	211.6	88794.3

Table 8: Natomas East Main Drainage Canal West Levee Reaches F-G (NEMDC North) - Phase 4b Improvements

Project Information																
Scrapper Unloading					0.03	0.00		lb/ton	-	-	-	36997.50	5179.65	-	-	lb/yr
Total Emissions (lb/year) = 3,566.71 19,343.40 853.89 131,742.44 6,129.62 12,294.40 2,221,000.70 lb/yr																
Total Emissions (lb/day) = 39.63 214.93 9.49 1,463.80 68.11 136.60 24,677.79 lb/day																
[6] Demobilization/cleanup (Follows No. 5)																
Mobile Sources																
Haul Truck(s)	2	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile ¹	0.14	1.80	0.07	-	0.06	-	210.22	lb/yr
Haul Truck(s)	24	trucks	10.18	-	0.01	0.01	199.87	g/trip ²	0.54	-	0.00	-	0.00	-	10.58	lb/yr
Off-Highway Truck	2		0.26	2.13	0.08	0.07	324.22	lb/day	6.20	51.10	1.81	-	1.66	-	7,781.33	lb/yr
Pallet Loader	1		0.36	2.75	0.16	0.14	307.16	lb/day	4.30	33.01	1.86	-	1.71	-	3,685.89	lb/yr
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	4.14	5.22	0.72	-	0.69	-	7,065.90	lb/yr
Fugitive Sources																
Travel on unpaved roads	26	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	23.16	-	2.17	-	lb/yr
Travel on paved roads	26	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	7.29	-	1.07	-	lb/yr
Total Emissions (lb/year) = 15.32 91.13 4.46 30.45 4.14 3.24 18,753.92 lb/yr																
Total Emissions (lb/day) = 1.28 7.59 0.37 2.54 0.34 0.27 1,562.83 lb/day																

*Assumes that material hauling is along 90% paved and 10% unpaved haul routes based on location of borrow areas.
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)
 Activity Period (days) = 12.0
 *Assumes haul load is approximately 1 miles roundtrip
 *Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)

Summary - NEMDC North										ROG	NOX	PM10		PM2.5		CO2	
												COMB	EM	COMB	EM		
2016 Total from NEMDC North (tons/year) =										3.9	22.2	1.0	113.4	3.6	12.5	2502.4	
2016 Total from NEMDC North (lb/day) - Worst Case =										45.8	264.2	13.1	1463.8	68.1	148.4	29048.9	
2016 Emissions in Sacramento County (tons/year) =										51.7%	2.01	11.46	0.54	58.64	1.88	6.45	1293.83
2016 Emissions in Sacramento County (lb/day)- Worst Case										51.7%	23.7	136.6	6.8	756.8	35.2	76.7	15019.3
2016 Emissions in Sutter County (tons/year) =										48.9%	1.90	10.84	0.51	55.45	1.78	6.10	1223.50
2016 Emissions in Sutter County (lb/day)- Worst Case										48.9%	22.4	129.2	6.4	715.7	33.3	72.5	14203.0

*These calculations represent worst-case emissions from construction activities associated with NEMDC North work.

Year	Group	Phase	Emissions (lb/day)							
			ROG	NOx	PM10		PM2.5		CO2	
					COMB	EM	COMB	EM		
2016	I	1	5.6	45.6	2.1	11.8	1.9	1.3		5617.0
		2	1.7	11.8	0.5	2.5	0.5	0.3		2197.1
		Total	7.2	57.4	2.6	14.3	2.4	1.5		7814.1
	II	3	11.0	88.1	4.5	2.5	4.2	0.3		9787.7
		Total	11.0	88.1	4.5	2.5	4.2	0.3		9787.7
	III	4	45.8	264.2	13.1	1115.5	12.2	148.4		29048.9
		Total	45.8	264.2	13.1	1115.5	12.2	148.4		29048.9
	IV	5	39.6	214.9	9.5	1463.8	68.1	136.6		24677.8
		Total	39.6	214.9	9.5	1463.8	68.1	136.6		24677.8
	V	6	1.3	7.6	0.4	2.5	0.3	0.3		1562.8
		Total	1.3	7.6	0.4	2.5	0.3	0.3		1562.8
			Worst-case lb/day =	45.8	264.2	13.1	1463.8	68.1	148.4	29048.9

Table 9: West Drainage Canal - Phase 4b Improvements

Project Information		Phase 4b West Drainage Canal (WDC) includes canal realignment Work Schedule - May - Nov., 2013												
Total WDC length in Phase 4b =		3.2 mi		16896.0 ft		Conversion		0.002204623 lb/gram		2000 lb/ton				
WDC length in Sacramento County =		16896.0 ft		100.0%		of the total length								
		Emission Factor					Emissions (lb/yr)					Input Data		
Qty	Unit	ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10	PM2.5	CO2	Unit	
								COMB	EM	COMB	EM			
(1) Mobilization														
Mobile Sources														
Scrapper	1	0.46	4.36	0.18	0.16	409.54	lb/day	3.72	34.89	1.41	-	1.30	-	3,276.35
Dozer	1	0.46	4.06	0.17	0.16	335.60	lb/day	1.83	16.23	0.69	-	0.64	-	1,342.39
Compactor	1	0.29	1.80	0.09	0.08	244.59	lb/day	0.57	3.60	0.17	-	0.16	-	489.18
Loader	1	0.43	3.33	0.19	0.18	307.16	lb/day	1.28	9.99	0.58	-	0.53	-	921.47
Backhoe	1	0.19	1.28	0.05	0.05	312.85	lb/day	0.19	1.28	0.05	-	0.05	-	312.85
Employee Trips	1	employees	0.02	0.03	0.00	39.29	lb/day/empk	0.41	0.52	0.07	-	0.07	-	1,066.39
Total Emissions (lb/year) =							8.0	66.5	3.0	0.0	2.7	0.0	7048.8	lb/yr
Total Emissions (lb/day) =							0.44	3.70	0.17	0.00	0.15	0.00	391.60	lb/day
(2) Clear and Grub														
Mobile Sources														
Water Truck	1	0.10	1.27	0.05	0.05	163.47	lb/day	0.50	6.35	0.25	-	0.23	-	817.35
Scrapper(s)	8	0.46	4.36	0.18	0.16	409.54	lb/day	18.58	174.44	7.05	-	6.49	-	16,381.75
Employee Trips	15	employees	0.02	0.03	0.00	39.29	lb/day/empk	1.73	2.18	0.30	-	0.29	-	2,944.13
Total Emissions (lb/year) =							20.8	183.0	7.6	2198.3	7.0	279.2	20143.2	lb/yr
Total Emissions (lb/day) =							4.2	36.6	1.5	439.7	1.4	55.8	4028.6	lb/day
Fugitive Sources														
Travel on unpaved roads	719.5	VMT/yr	-	-	0.90	0.08	-	-	-	-	-	645.9	-	69.5
Travel on paved roads	719.5	VMT/yr	-	-	0.28	0.04	-	-	-	-	-	203.2	-	29.9
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
(3) Canal Excavation														
Mobile Sources														
Water Truck(s)	2	0.10	1.27	0.05	0.05	163.47	lb/day	5.60	71.12	2.80	-	2.56	-	9,154.32
Scrapper(s)	8	0.46	4.36	0.18	0.16	409.54	lb/day	104.05	976.89	39.47	-	36.32	-	91,737.81
Employee Trips	15	employees	0.02	0.03	0.00	39.29	lb/day/empk	9.66	12.18	1.98	-	1.62	-	16,487.10
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
Fugitive Sources														
Travel on unpaved roads	3558	VMT/yr	-	-	0.90	0.08	-	-	-	-	-	3,193.63	-	299.13
Travel on paved roads	3558	VMT/yr	-	-	0.28	0.04	-	-	-	-	-	1,004.56	-	147.58
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
(4) Canal Embankment														
Mobile Sources														
Dump Truck(s)	10	0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	38,906.86
Dozer(s)	4	0.46	4.06	0.17	0.16	335.60	lb/day	16.48	146.11	6.23	-	5.73	-	12,081.82
Water Truck(s)	2	0.10	1.27	0.05	0.05	163.47	lb/day	1.20	15.24	0.80	-	0.81	-	1,961.64
Compactor(s)	2	0.29	1.80	0.09	0.08	244.59	lb/day	2.29	14.39	0.88	-	0.83	-	1,956.71
Employee Trips	15	employees	0.02	0.03	0.00	39.29	lb/day/empk	10.70	13.49	1.96	-	1.79	-	18,253.58
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
Fugitive Sources														
Travel on unpaved roads	5,360	VMT/yr	-	-	0.90	0.08	-	-	-	-	-	4,811.4	-	450.7
Travel on paved roads	5,360	VMT/yr	-	-	0.28	0.04	-	-	-	-	-	1,513.4	-	222.3
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
(5) Canal Abandonment														
Mobile Sources														
Dump Truck(s)	10	0.30	2.76	0.10	0.10	324.22	lb/day	32.33	278.32	10.08	-	9.27	-	38,906.86
Dozer(s)	4	0.46	4.06	0.17	0.16	335.60	lb/day	15.23	131.37	5.51	-	5.07	-	12,081.82
Water Truck(s)	2	0.10	1.27	0.05	0.05	163.47	lb/day	1.20	15.24	0.80	-	0.81	-	1,961.64
Compactor(s)	2	0.29	1.80	0.09	0.08	244.59	lb/day	2.28	14.39	0.88	-	0.83	-	1,956.71
Employee Trips	15	employees	0.02	0.03	0.00	39.29	lb/day/empk	10.70	13.49	1.96	-	1.79	-	18,253.58
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
Fugitive Sources														
Travel on unpaved roads	16,968	VMT/yr	-	-	0.90	0.08	-	-	-	-	-	15,232.5	-	1,426.7
Travel on paved roads	16,968	VMT/yr	-	-	0.28	0.04	-	-	-	-	-	4,791.4	-	703.9
Total Emissions (lb/year) =							119.31	1,060.19	43.95	10,868.54	40.51	1,380.56	117,379.23	lb/yr
Total Emissions (lb/day) =							4.26	37.86	1.57	388.16	1.45	49.31	4,192.12	lb/day
(6) Topsoil Respread														
Mobile Sources														
Loader(s)	3	0.38	2.93	0.17	0.16	307.16	lb/day	14.83	114.40	6.59	-	6.06	-	11,979.15
Employee Trips	15	employees	0.02	0.03	0.00	39.29	lb/day/empk	4.49	5.66	0.78	-	0.75	-	7,654.73
Total Emissions (lb/year) =							61.73	452.68	18.62	20,704.79	17.21	2,170.00	73,160.09	lb/yr
Total Emissions (lb/day) =							0.59	4.31	0.18	197.19	0.16	20.67	696.76	lb/day
Fugitive Sources														
Travel on unpaved roads	2766	VMT/yr	-	-	0.90	0.08	-	-	-	-	-	2,492.88	-	232.55
Travel on paved roads	2766	VMT/yr	-	-	0.28	0.04	-	-	-	-	-	780.99	-	114.74
Total Emissions (lb/year) =							61.73	452.68	18.62	20,704.79	17.21	2,170.00	73,160.09	lb/yr
Total Emissions (lb/day) =							0.59	4.31	0.18	197.19	0.16	20.67	696.76	lb/day

Table 9: West Drainage Canal - Phase 4b Improvements

Project Information																									
[7] Seeding																									
Mobile Sources																									
Off-Highway Trucks	2		0.27	2.32	0.08	0.08	324.22	lb/day	7.54	64.84	2.35	-	2.16	-	9,078.21	lb/yr	Off Highway Truck	14	6.00	12.00	0.41				
Water Trucks	4		0.10	1.27	0.05	0.05	163.47	lb/day	6.90	76.20	3.00	-	2.76	-	9,838.20	lb/yr	Water Truck	15	6.00	24.00	0.93				
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	10.01	12.62	1.74	-	1.68	-	17,075.93	lb/yr	Total =	29		36.00	1.24				
Fugitive Sources																									
Travel on unpaved roads	18	VM/yr	-	-	0.90	0.08	-	lb/VM	-	-	-	-	16.16	-	1.51	-	lb/yr	*Assumes haul load=14 yd ³							
Travel on paved roads	18	VM/yr	-	-	0.28	0.04	-	lb/VM	-	-	-	-	5.08	-	0.75	-	lb/yr	*Data provided by HDR							
Total Emissions (lb/year) =																									
Total Emissions (lb/day) =																									
[8] Pipe Installation																									
Mobile Sources																									
Backhoe	1		0.18	1.19	0.05	0.04	312.85	lb/day	0.55	3.58	0.14	-	0.13	-	938.54	lb/yr	Excavation	356	Backhoe	3	400	86	0.1	12.00	4.00
Dozer	1		0.42	3.65	0.15	0.14	335.60	lb/day	0.42	3.65	0.15	-	0.14	-	335.60	lb/yr	--	--	Dozer	1	580	41	0.1	5.80	5.80
Water Truck	1		0.10	1.27	0.05	0.05	163.47	lb/day	0.10	1.27	0.05	-	0.05	-	163.47	lb/yr	Tons/CY	Tons/day	Water Truck	0	1888	0.0	0.1	0.00	4.00
Compactor	1		0.28	1.76	0.07	0.07	244.59	lb/day	0.28	1.76	0.07	-	0.07	-	244.59	lb/yr			Compactor	1	280	20.0	0.1	2.80	2.80
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	1.73	2.18	0.30	-	0.29	-	2,944.13	lb/yr	Total =	5		147	0.6	20.6	12.6		
Fugitive Sources																									
Travel on unpaved roads	10	VM/yr	-	-	0.90	0.08	-	lb/VM	-	-	-	-	9.25	-	0.87	-	lb/yr	*Assumes haul load=14 yd ³							
Travel on paved roads	10	VM/yr	-	-	0.28	0.04	-	lb/VM	-	-	-	-	2.91	-	0.43	-	lb/yr	*Data provided by HDR							
Total Emissions (lb/year) =																									
Total Emissions (lb/day) =																									
[9] Demobilization																									
Mobile Sources																									
Scraper	1		0.42	3.84	0.15	0.14	409.54	lb/day	3.40	30.74	1.21	-	1.12	-	3,276.35	lb/yr	Scraper	8							
Dozer	1		0.42	3.65	0.15	0.14	335.60	lb/day	1.69	14.60	0.61	-	0.56	-	1,342.39	lb/yr	Dozer	4							
Compactor	1		0.28	1.76	0.07	0.07	244.59	lb/day	0.57	3.57	0.14	-	0.13	-	489.18	lb/yr	Compactor	2							
Loader	1		0.38	2.93	0.17	0.16	307.16	lb/day	1.14	8.80	0.51	-	0.47	-	921.47	lb/yr	Loader	3							
Backhoe	1		0.18	1.19	0.05	0.04	312.85	lb/day	0.18	1.19	0.05	-	0.04	-	312.85	lb/yr	Backhoe	1							
Employee Trips	1	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	0.41	0.52	0.07	-	0.07	-	706.59	lb/yr	Total =	18							
Total Emissions (lb/year) =																									
Total Emissions (lb/day) =																									
Summary - West Drainage Canal																									
2013 Total from WDC (tons/year) =																									
2013 Total from WDC (lb/day) - Worst Case =																									

*These calculations represent worst-case emissions from construction activities associated with WDC work

Year	Phase	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2013	1	0.4	3.7	0.2	0.0	0.2	0.0	391.6
	2	4.2	36.6	1.5	439.7	1.4	55.8	4028.6
	3	4.3	37.9	1.6	388.2	1.4	49.3	4192.1
	4	2.1	16.8	0.7	210.4	0.7	22.1	2360.0
	5	0.6	4.3	0.2	197.2	0.2	20.7	696.8
	6	1.5	9.2	0.6	257.6	0.5	26.9	1510.3
	7	0.81	5.30	0.24	0.73	0.23	0.08	1240.08
	8	0.6	2.5	0.1	2.4	0.1	0.3	925.3
	9	0.4	3.3	0.1	0.0	0.1	0.0	391.6
Worst-case lb/day =		4.3	37.9	1.6	439.7	1.4	55.8	4192.1

Table 10: Riego Road Canal Relocation - Phase 4b Improvements

Project Information																		
Truck Unloading					0.01	0.00		lb/ton				38.65		0.98		lb/yr		
Total Emissions (lb/year) = 8.11 60.48 3.54 187.57 3.26 16.82 6,235.43 lb/yr																		
Total Emissions (lb/day) = 1.35 10.08 0.59 31.26 0.54 2.80 1,039.24 lb/day																		
*Assumes that material hauling is along 50% paved and 50% unpaved haul routes																		
[7] Seeding																		
Mobile Sources																		
Off-Highway Truck(s)	1		0.30	2.76	0.10	0.10	324.22	lb/day	1.19	11.05	0.41	-	0.38	-	1,296.80	lb/yr	0.60	0.08
Water Truck(s)	2		0.10	1.27	0.05	0.05	163.47	lb/day	0.80	10.16	0.40	-	0.37	-	1,307.76	lb/yr	1.20	0.15
Employee Trips	3	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empld	0.55	0.70	0.10	-	0.09	-	942.12	lb/yr	1.80	0.23
Total = 8																		
Haul Truck capacity (CY) = 14.0																		
Fugitive Sources																		
Travel on unpaved roads	1	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	0.81	-	0.08	-	lb/yr		
Travel on paved roads	1	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	0.25	-	0.04	-	lb/yr		
Total Emissions (lb/year) = 2.54 21.90 0.91 1.06 0.84 0.11 3,546.77 lb/yr																		
Total Emissions (lb/day) = 0.32 2.74 0.11 0.13 0.11 0.01 443.35 lb/day																		
*Assumes that material hauling is along 50% paved and 50% unpaved haul routes																		
[8] Pipe Installation																		
Mobile Sources																		
Backhoe	1		0.19	1.28	0.05	0.05	312.85	lb/day	0.19	1.28	0.05	-	0.05	-	312.85	lb/yr		
Dozer	1		0.46	4.06	0.17	0.16	335.60	lb/day	0.46	4.06	0.17	-	0.16	-	335.60	lb/yr		
Water Truck	1		0.10	1.27	0.05	0.05	163.47	lb/day	0.10	1.27	0.05	-	0.05	-	163.47	lb/yr		
Compactor	1		0.29	1.80	0.09	0.08	244.59	lb/day	0.29	1.80	0.09	-	0.08	-	244.59	lb/yr		
Employee Trips	3	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empld	0.14	0.17	0.02	-	0.02	-	235.53	lb/yr		
Total = 2																		
Haul Truck capacity (CY) = 14.0																		
Fugitive Sources																		
Travel on unpaved roads	1	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	0.87	-	0.08	-	lb/yr		
Travel on paved roads	1	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	0.27	-	0.04	-	lb/yr		
Total Emissions (lb/year) = 1.18 8.58 0.39 1.15 0.36 0.12 1,292.03 lb/yr																		
Total Emissions (lb/day) = 0.59 4.29 0.19 0.57 0.18 0.06 446.02 lb/day																		
*Assumes that material hauling is along 50% paved and 50% unpaved haul routes																		
[9] Demobilization																		
Mobile Sources																		
Scrapper	1		0.46	4.36	0.18	0.16	499.54	lb/day	0.93	8.72	0.35	-	0.32	-	519.00	lb/yr		
Dozer	1		0.46	4.06	0.17	0.16	335.60	lb/day	0.92	8.12	0.35	-	0.32	-	671.20	lb/yr		
Compactor	1		0.29	1.80	0.09	0.08	244.59	lb/day	0.57	3.60	0.17	-	0.16	-	489.18	lb/yr		
Loader	1		0.43	3.33	0.19	0.18	307.16	lb/day	0.85	6.66	0.38	-	0.35	-	614.32	lb/yr		
Backhoe	1		0.19	1.28	0.05	0.05	312.85	lb/day	0.19	1.28	0.05	-	0.05	-	312.85	lb/yr		
Employee Trips	1	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empld	0.21	0.26	0.04	-	0.03	-	353.30	lb/yr		
Total = 9																		
Fugitive Sources																		
Travel on unpaved roads			-	-	0.90	0.08	-	lb/VMT	-	-	-	-	-	-	-	lb/yr		
Travel on paved roads			-	-	0.28	0.04	-	lb/VMT	-	-	-	-	-	-	-	lb/yr		
Total Emissions (lb/year) = 3.7 28.6 1.3 0.0 1.2 0.0 3259.9 lb/yr																		
Total Emissions (lb/day) = 0.41 3.18 0.15 0.00 0.14 0.00 362.21 lb/day																		
Summary - Riego Road Canal Relocation																		
2014 Total from Riego Road (tons/year) =																		
2014 Total from Riego Road (lb/day) - Worst Case =																		
*These calculations represent worst-case emissions from construction activities associated with Riego Road Canal Relocation work																		

Year	Phase	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2014	1	0.4	3.2	0.1	0.0	0.1	0.0	362.2
	2	1.1	10.1	0.4	108.5	0.4	13.7	1100.3
	3	1.1	10.1	0.4	99.2	0.4	12.5	1100.3
	4	1.7	12.7	0.5	31.4	0.5	3.2	1919.4
	5	1.7	13.1	0.6	28.9	0.5	2.9	1951.4
	6	1.4	10.1	0.6	31.3	0.5	2.9	1039.2
	7	0.3	2.7	0.1	0.1	0.1	0.0	443.3
	8	0.6	4.3	0.2	0.6	0.2	0.1	646.0
	9	0.4	3.2	0.1	0.0	0.1	0.0	362.2
Worst-case lb/day =		1.7	13.1	0.6	108.5	0.5	13.7	1951.4

Table 11: Natomas Cross Canal (NCC) Bridge Cutoff Wall and Closure Structure Work - Phase 4b Improvements

Project Information																							
Phase 4b NCC Bridge Cutoff Wall and Closure Structure Work includes construction of moveable barrier, modifications of bridge decks, and seepage remediation																							
Work Schedule: May - Nov, 2012 (1 through 5)																							
Total NCC Bridge Cutoff Wall length in Phase 4b =											0.1 mi	Conversion											
											475.2 ft												
NCC Bridge Cutoff Wall length in Sutter County =											475.2 ft	100.0%	of the total length		0.002204623 lb/gram								
														2000 lb/ton									
Activity	Qty	Unit	Emission Factor							Emissions (lb/yr)							Input Data						
			ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10		PM2.5		CO2	Unit	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day	
[1] Traffic Bypass Construction																							
Mobile Sources																							
Motor Grader	1		0.49	3.79	0.22	0.20	346.97	lb/day	4.89	37.94	2.20	-	2.02	-	3,469.74	lb/yr			0.18	3.60	0.36		
Water Truck	1		0.10	1.27	0.05	0.05	163.47	lb/day	1.00	12.70	0.50	-	0.46	-	1,634.70	lb/yr			Activity Period (days) = 10.0				
Front-end Loader	1		0.43	3.33	0.19	0.18	307.16	lb/day	4.27	33.31	1.92	-	1.77	-	3,071.58	lb/yr			*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes				
Paver	1		0.84	4.94	0.44	0.40	352.66	lb/day	8.36	49.39	4.36	-	4.01	-	3,526.63	lb/yr							
Pickup Truck	2		0.02	0.03	0.00	0.00	39.26	lb/day	0.46	0.58	0.08	-	0.08	-	785.10	lb/yr							
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp/cd	3.45	4.35	0.60	-	0.58	-	5,888.25	lb/yr							
Fugitive Sources																							
Travel on unpaved roads	2	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	1.62	-	0.15	-	lb/yr						
Travel on paved roads	2	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	0.51	-	0.07	-	lb/yr						
Total Emissions (lb/year) =											22.43	138.28	9.66	2.12	8.92	0.23	18,376.00	lb/yr					
Total Emissions (lb/day) =											2.24	13.83	0.97	0.21	0.89	0.02	1,837.60	lb/day					
[2] Cutoff Wall Installation - Southbound Lanes (follows no. 1) - Activity occurs 24 hours per day, 7 days per week																							
Mobile Sources																							
Mix Rig	1		1.73	11.33	0.97	0.89	1,057.99	lb/day	10.39	67.96	5.83	-	5.36	-	6,347.93	lb/yr	Reinforced Concrete	25.00	2	0.18	0.32	0.05	
Excavator	1		1.27	9.67	0.58	0.53	972.67	lb/day	7.64	58.04	3.46	-	3.18	-	5,835.99	lb/yr	Aggregate Base Rock**	500.00	36	60.00	2,142.86	357.14	
Loader	1		1.28	9.99	0.58	0.53	921.47	lb/day	7.69	59.96	3.46	-	3.19	-	5,528.84	lb/yr	Total =	525.00	37.50	60.18	2,143.18	357.20	
Employee Trips	35	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp/cd	4.83	6.09	0.84	-	0.81	-	8,243.55	lb/yr	Material	Tons/CY	Tons/day	Activity Period (days) = 6.0			
Travel on unpaved roads	214.3	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	192.4	-	18.0	-	lb/yr	--	1.25	109.4	Haul Truck capacity (CY) = 14.0		
Travel on paved roads	1928.9	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	544.7	-	80.0	-	lb/yr			*Assumes 10% of VMT occur on unpaved roads; 90% of VMT occurs during material transport to and from commercial location.			
Material Handling																							
Truck Unloading			-	-	0.01	0.00	-	lb/ton	-	-	-	-	3.4	-	0.1	-	lb/yr			*Assumes haul load=14 yd ³			
Total Emissions (lb/year) =											30.55	192.05	13.58	740.50	12.53	98.13	25,956.31	lb/yr					
Total Emissions (lb/day) =											5.09	32.01	2.26	123.42	2.09	16.35	4,326.05	lb/day					
[3] Traffic Bypass Reconfiguration (follows no. 2) - Work conducted in 10-hr shifts, 6 days per week																							
Mobile Sources																							
Mix Rig	1		0.61	4.74	0.27	0.25	433.72	lb/day	6.12	47.43	2.75	-	2.53	-	4,337.18	lb/yr	Asphalt Concrete Paving	800.00	57	0.18	10.29	1.03	
Water Truck	1		0.13	1.59	0.06	0.06	204.34	lb/day	1.25	15.88	0.63	-	0.58	-	2,043.38	lb/yr	Material	Tons/CY	Tons/day	Activity Period (days) = 10.0			
Front-end Loader	1		0.53	4.16	0.24	0.22	383.95	lb/day	5.34	41.64	2.41	-	2.21	-	3,839.47	lb/yr	1.25	100.0	Haul Truck capacity (CY) = 14.0				
Paver	1		1.04	6.17	0.54	0.50	440.83	lb/day	10.45	61.74	5.45	-	5.01	-	4,408.28	lb/yr			*Assumes haul load=14 yd ³				
Pickup Truck(s)	2		0.02	0.03	0.00	0.00	39.26	lb/day	0.46	0.58	0.08	-	0.08	-	785.10	lb/yr			*Assumes that material hauling occurs on 50% paved and 50% unpaved haul routes				
Employee Trips	25	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp/cd	5.75	7.25	1.00	-	0.96	-	9,813.75	lb/yr							
Travel on unpaved roads	5	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	4.62	-	0.43	-	lb/yr						
Travel on paved roads	5	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	1.45	-	0.21	-	lb/yr						
Material Handling																							
Truck Unloading			-	-	0.01	0.00	-	lb/ton	-	-	-	-	5.3	-	0.1	-	lb/yr			*Assumes 50% of material used in No. 2 and 50% used in No. 4			
Total Emissions (lb/year) =											29.37	174.51	17.55	6.07	11.50	0.65	25,227.16	lb/yr					
Total Emissions (lb/day) =											2.94	17.45	1.76	123.55	2.09	16.36	4,326.05	lb/day					
[4] Cutoff Wall Installation - Northbound Lanes (follows no. 3) (Activity occurs 24 hours per day, 7 days per week)																							
Mobile Sources																							
Mix Rig	1		1.73	11.33	0.97	0.89	1,057.99	lb/day	10.39	67.96	5.83	-	5.36	-	6,347.93	lb/yr	Reinforced Concrete	25.00	2	0	0.32	0.05	
Excavator	1		1.27	9.67	0.58	0.53	972.67	lb/day	7.64	58.04	3.46	-	3.18	-	5,835.99	lb/yr	Aggregate Base Rock**	500.00	36	60	2,142.86	357.14	
Loader	1		1.28	9.99	0.58	0.53	921.47	lb/day	7.69	59.96	3.46	-	3.19	-	5,528.84	lb/yr	Total =	525.00	37.50	60.18	2,143.18	357.20	
Employee Trips	35	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp/cd	4.83	6.09	0.84	-	0.81	-	8,243.55	lb/yr	Material	Tons/CY	Tons/day	Activity Period (days) = 6.0			
Travel on unpaved roads	214.3	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	192.4	-	18.0	-	lb/yr	--	1.25	135.4	Haul Truck capacity (CY) = 14.0		
Travel on paved roads	1928.9	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	544.7	-	80.0	-	lb/yr			*Assumes 10% of VMT occur on unpaved roads; 90% of VMT occurs during material transport to and from commercial location.			
Material Handling																							
Truck Unloading			-	-	0.01	0.00	-	lb/ton	-	-	-	-	4.3	-	0.1	-	lb/yr			*Assumes haul load=14 yd ³			
Total Emissions (lb/year) =											30.55	192.05	13.58	741.32	12.53	98.15	25,956.31	lb/yr					
Total Emissions (lb/day) =											5.09	32.01	2.26	123.55	2.09	16.36	4,326.05	lb/day					
[5] Closure Structure Construction (follows no. 4)																							
Mobile Sources																							
Pickup Truck(s)	2		0.02	0.03	0.00	0.00	39.26	lb/day	1.38	1.74	0.24	-	0.23	-	2,355.30	lb/yr	-	-	-	0.18	10.80	0.36	
Light Duty Crane	1		0.25	2.41	0.09	0.09	244.59	lb/day	7.42	72.18	2.79	-	2.56	-	7,337.65	lb/yr			Activity Period (days) = 30.0				
Concrete Truck(s)	7		0.71	4.20	0.37	0.34	301.47	lb/day	149.04	882.66	77.74	-	71.52	-	63,308.65	lb/yr			*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes				

Table 11: Natomas Cross Canal (NCC) Bridge Cutoff Wall and Closure Structure Work - Phase 4b Improvements

Project Information																
Loader	1		0.43	3.33	0.19	0.18	307.16	lb/day	12.82	99.93	5.77	-	5.31	-	9,214.73	lb/yr
Backhoe	1		0.19	1.28	0.05	0.05	312.85	lb/day	5.81	38.31	1.64	-	1.51	-	9,385.37	lb/yr
Employee Trips	35	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emplic	24.15	30.45	4.20	-	4.05	-	41,217.75	lb/yr
Fugitive Sources																
Travel on unpaved roads	5	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	4.8	-	0.5	-	lb/yr
Travel on paved roads	5	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	1.5	-	0.2	-	lb/yr
Total Emissions (lb/year) =									200.62	1,125.27	92.38	6.37	85.19	0.68	132,819.45	lb/yr
Total Emissions (lb/day) =									6.69	37.51	3.08	0.21	2.84	0.02	4,427.32	lb/day

Summary - Natomas Cross Canal Bridge Cutoff Wall							ROG	NOX	PM10		PM2.5		CO2
									COMB	EM	COMB	EM	
2012 Total from NCC Bridge Cutoff Wall (tons/year) =							0.2	0.9	0.1	0.7	0.1	0.1	114.2
2012 Total from NCC Bridge Cutoff Wall (lb/day) - Worst Case =							6.7	37.5	3.1	123.6	2.8	16.4	4427.3

*These calculations represent worst-case emissions from construction activities associated with NCC Bridge Cutoff Wall work

Year	Phase	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2012	1	2.2	13.8	1.0	0.2	0.9	0.0	1837.6
	2	5.1	32.0	2.3	123.4	2.1	16.4	4326.1
	3	2.9	17.5	1.8	0.6	1.1	0.1	2522.7
	4	5.1	32.0	2.3	123.6	2.1	16.4	4326.1
	5	6.7	37.5	3.1	0.2	2.8	0.0	4427.3
Worst-case lb/day =		6.7	37.5	3.1	123.6	2.8	16.4	4427.3

Table 12: Natomas Cross Canal (NCC) South Levee Ditch Relocations - Phase 4b Improvements

Project Information																							
Phase 4b NCC South Levee Ditch Relocations includes relocation of Vestal Drainage Ditch and Morrison Irrigation Canal Work Schedule: May - Nov, 2012 (1 through 3)																							
Total NCC South Levee Ditch Relocation length in Phase 4b =										4.0	mi	Conversion											
NCC South Levee Ditch Relocation length in Sutter County =										21120.0	ft	100.0%	of the total length	0.002204623	lb/gram								
												2000	lb/ton										
	Qty	Unit	Emission Factor					Emissions (lb/yr)					Input Data										
			ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10		PM2.5		CO2	Unit							
											COMB	EM	COMB	EM									
[1] Clearing and grubbing/stripping																							
Mobile Sources																							
Elevating Scraper(s)		4		0.46	4.36	0.18	0.16	409.54	lb/day	27.87	261.67	10.57	-	9.73	-	24,572.63	lb/yr	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
Water Truck(s)		2		0.10	1.27	0.05	0.05	163.47	lb/day	3.00	38.10	1.50	-	1.38	-	4,904.10	lb/yr	Excavated Material	41,666.00	2,976.14	2.00	5,952.29	396.82
Front-end Loader(s)		4		0.43	3.33	0.19	0.18	307.16	lb/day	26.64	199.85	11.54	-	10.62	-	18,429.46	lb/yr	Material	Tons/CY	Tons/day			
Pickup Truck		5		0.02	0.03	0.00	0.00	39.26	lb/day	1.73	2.18	0.30	-	0.29	-	2,944.13	lb/yr	--	1.25	3472.2			
Employee Trips		25	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emplk	8.63	10.88	1.50	-	1.45	-	14,720.63	lb/yr	Activity Period (days) = 15.0					
Fugitive Sources																							
Travel on unpaved roads		2976	VM/yr	-	-	0.90	0.08	-	lb/VM	-	-	-	-	-	2,671.72	-	250.24	-	-	-			
Travel on paved roads		2976	VM/yr	-	-	0.28	0.04	-	lb/VM	-	-	-	-	-	840.39	-	123.47	-	-	-	*Assumes that material hauling is along 50% paved and 50% unpaved haul routes		
Material Handling																							
Scraper Unloading				-	-	0.03	0.00	-	lb/ton	-	-	-	-	-	1,562.48	-	218.75	-	-	-			
Total Emissions (lb/year) =										66.86	512.67	25.42	5,074.59	23.46	592.45	65,570.94	lb/yr						
Total Emissions (lb/day) =										4.46	34.18	1.69	338.31	1.56	39.50	4,371.40	lb/day						
[2] Channel Excavation and Backfill (follows no. 1) - Work conducted in 10-hr shifts, 6 days per week																							
Mobile Sources																							
Elevating Scraper(s)		8		0.58	5.45	0.22	0.20	511.93	lb/day	139.35	1,308.33	52.87	-	48.64	-	122,863.14	lb/yr	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
Excavator(s)		2		0.53	4.03	0.24	0.22	405.28	lb/day	31.83	241.85	14.40	-	13.25	-	24,316.64	lb/yr	Excavated Material	83,334.00	5,952.43	2.00	11,904.86	396.83
Water Truck		1		0.10	1.27	0.05	0.05	163.47	lb/day	3.00	38.10	1.50	-	1.38	-	4,904.10	lb/yr	Material	Tons/CY	Tons/day			
Employee Trips		35	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emplk	24.15	30.45	4.20	-	4.05	-	41,217.75	lb/yr	--	1.25	3472.3	Activity Period (days) = 30.0		
Fugitive Sources																							
Travel on unpaved roads		5952.4	VM/yr	-	-	0.90	0.08	-	lb/VM	-	-	-	-	-	5343.6	-	500.5	-	-	-	*Assumes haul load=14 yd ³		
Travel on paved roads		5952.4	VM/yr	-	-	0.28	0.04	-	lb/VM	-	-	-	-	-	1680.8	-	246.9	-	-	-	*Assumes that material hauling occurs on 50% paved and 50% unpaved haul routes		
Material Handling																							
Scraper Unloading				-	-	0.03	0.00	-	lb/ton	-	-	-	-	-	3,125.0	-	437.5	-	-	-	1. Water trucks are assumed to operate for 8 hours per shift		
Total Emissions (lb/year) =										198.32	1,618.73	72.97	10,149.42	67.31	1,184.94	193,301.63	lb/yr						
Total Emissions (lb/day) =										6.61	53.96	2.43	338.31	2.24	39.50	6,443.39	lb/day						
[3] Demobilization/cleanup (follows no. 2)																							
Mobile Sources																							
Water Truck(s)		2		0.10	1.27	0.05	0.05	163.47	lb/day	2.40	30.48	1.20	-	1.10	-	3,923.28	lb/yr	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
Hydroseeding Truck(s)		2		0.30	2.76	0.10	0.10	324.22	lb/day	7.12	66.28	2.49	-	2.29	-	7,791.33	lb/yr	Excavated Material	-	-	2.00	48.00	4.00
Front-end Loader		1		0.43	3.33	0.19	0.18	307.16	lb/day	5.13	39.97	2.31	-	2.12	-	3,685.89	lb/yr	Material	Tons/CY	Tons/day	Activity Period (days) = 12.0		
Haul Truck(s)		2		1.19	15.82	0.62	0.57	1,847.96	lb/day	28.63	379.73	14.88	-	13.69	-	44,351.04	lb/yr	--	1.25	3472.3	*Assumes that material hauling is along 50% paved and 50% unpaved haul routes		
Employee Trips		25	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emplk	6.90	8.70	1.20	-	1.16	-	11,776.50	lb/yr						
Fugitive Sources																							
Travel on unpaved roads		24	VM/yr	-	-	0.90	0.08	-	lb/VM	-	-	-	-	-	21.55	-	2.02	-	-	-			
Travel on paved roads		24	VM/yr	-	-	0.28	0.04	-	lb/VM	-	-	-	-	-	6.78	-	1.00	-	-	-			
Total Emissions (lb/year) =										50.18	525.16	22.08	28.32	20.36	3.01	71,518.04	lb/yr						
Total Emissions (lb/day) =										4.18	43.76	1.84	2.36	1.70	0.25	5,959.84	lb/day						

Summary - Natomas Cross Canal South Levee Ditch Relocations		ROG	NOX	PM10		PM2.5		CO2
2012 Total from NCC South Levee Ditch Relocations (tons/year) =		0.2	1.3	0.1	7.6	0.1	0.9	165.2
2012 Total from NCC South Levee Ditch Relocations (lb/day) - Worst Case =		6.6	54.0	2.4	338.3	2.2	39.5	6443.4

*These calculations represent worst-case emissions from construction activities associated with NCC South Levee Ditch Relocations work

Year	Phase	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2012	1	4.5	34.2	1.7	338.3	1.6	39.5	4371.4
	2	6.6	54.0	2.4	338.3	2.2	39.5	6443.4
	3	4.2	43.8	1.8	2.4	1.7	0.3	5959.8
Worst-case lb/day =		6.6	54.0	2.4	338.3	2.2	39.5	6443.4

Table 13: Reclamation District 1000 Pumping Plants - Phase 4b Improvements

Project Information
 Phase 4b Reclamation District 1000 Pumping Plants includes raising and replacement of discharge pipes
 Work Schedule: May - Nov, 2015 (1 through 4)

Total Reclamation District 1000 Pumping Plant work length in Phase 4b =	0.5 mi		
	2640.0 ft		
Pumping Plant length in Sacramento County =	2640.0 ft	100.0%	of the total length

Conversion	
0.002204623	lb/gram
2000	lb/ton

Qty	Unit	Emission Factor								Emissions (lb/yr)								Input Data																													
		ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10		PM2.5		CO2	Unit	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day																										
																						COMB	EM	COMB	EM																						
[1] Pumping Plant 1A - Pipeline Relocation, Pumping House Relocation, Channel Realignment																																															
Mobile Sources																																															
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00																									
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0	40.0																										
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-																												
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	39,906.66	lb/yr	-	-	-																												
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-																												
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-																												
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-																												
Fugitive Sources																																															
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-																									
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-																									
Total Emissions (lb/year) =																						406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr																		
Total Emissions (lb/day) =																						10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day																		
[2] Pumping Plant 1B - Pipeline Relocation, Pumping House Relocation, Channel Realignment																																															
Mobile Sources																																															
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00																									
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0	40.0																										
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-																												
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	39,906.66	lb/yr	-	-	-																												
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-																												
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-																												
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-																												
Fugitive Sources																																															
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-																									
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-																									
Total Emissions (lb/year) =																						406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr																		
Total Emissions (lb/day) =																						10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day																		
[3] Pumping Plant No. 6 - Pipeline Relocation, Pumping House Relocation, Channel Realignment																																															
Mobile Sources																																															
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00																									
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0	40.0																										
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-																												
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	39,906.66	lb/yr	-	-	-																												
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-																												
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-																												
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-																												
Fugitive Sources																																															
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-																									
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-																									
Total Emissions (lb/year) =																						406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr																		
Total Emissions (lb/day) =																						10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day																		
[4] Pumping Plant No. 8 - Pipeline Relocation, Pumping House Relocation, Channel Realignment																																															
Mobile Sources																																															
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00																									
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0	40.0																										
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-																												
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	39,906.66	lb/yr	-	-	-																												
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-																												
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-																												
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-																												
Fugitive Sources																																															
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-																									
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-																									
Total Emissions (lb/year) =																						406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr																		
Total Emissions (lb/day) =																						10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day																		

Summary - Reclamation District 1000 Pumping Plants								ROG	NOX	PM10		PM2.5		CO2
2015 Total from Reclamation District 1000 Pumping Plants (tons/year) =								0.8	6.4	0.3	0.1	0.3	0.0	716.0
2015 Total from Reclamation District 1000 Pumping Plants (lb/day) - Worst Case =								10.2	80.4	4.3	1.8	4.0	0.2	8949.8

*These calculations represent worst-case emissions from construction activities associated with Reclamation District 1000 Pumping Plant work

Year	Pumping Plant	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
	1A	10.2	80.4	4.3	1.8	4.0	0.2	8949.8

Table 13: Reclamation District 1000 Pumping Plants - Phase 4b Improvements

Project Information

2015	1B	10.2	80.4	4.3	1.8	4.0	0.2	8949.8
	No. 6	10.2	80.4	4.3	1.8	4.0	0.2	8949.8
	No. 8	10.2	80.4	4.3	1.8	4.0	0.2	8949.8
	Worst-case lb/day =	10.2	80.4	4.3	1.8	4.0	0.2	8949.8

Table 14: City of Sacramento Pumping Plants - Phase 4b Improvements

Project Information

Phase 4b City of Sacramento Pumping Plants includes raising and replacement of discharge pipes
 Work Schedule: May - Nov, 2013 (1 through 3)

Total City of Sacramento Pumping Plant work length in Phase 4b =	0.5 mi		
	2640.0 ft		
Pumping Plant length in Sacramento County =	2640.0 ft	100.0%	of the total length

Conversion	
0.002204623	lb/gram
2000	lb/ton

	Qty	Unit	Emission Factor						Emissions (lb/yr)								Input Data						
			ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10		PM2.5		CO2	Unit	Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day	
											COMB	EM	COMB	EM									
[1] City Sump 160 - Pipeline Relocation, Pumping House Relocation, Channel Realignment																							
Mobile Sources																							
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00	
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0			
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-	Activity Period (days) =	40.0		
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	38,906.66	lb/yr	-	-	-				
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-				
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-				
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-				
Fugitive Sources																							
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-	
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-	
Total Emissions (lb/year) =			406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr													
Total Emissions (lb/day) =			10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day													
[2] City Sump 58 - Pipeline Relocation, Pumping House Relocation, Channel Realignment																							
Mobile Sources																							
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00	
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0			
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-	Activity Period (days) =	40.0		
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	38,906.66	lb/yr	-	-	-				
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-				
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-				
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-				
Fugitive Sources																							
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-	
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-	
Total Emissions (lb/year) =			406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr													
Total Emissions (lb/day) =			10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day													
[3] City Sump 102 - Pipeline Relocation, Pumping House Relocation, Channel Realignment																							
Mobile Sources																							
Grader(s)	5		0.49	3.79	0.22	0.20	346.97	lb/day	97.87	758.88	43.94	-	40.43	-	69,394.87	lb/yr	-	-	-	1.00	120.00	3.00	
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	32.00	406.40	16.00	-	14.72	-	52,310.40	lb/yr	-	-	-	40.0			
Excavator(s)	10		0.42	3.22	0.19	0.18	324.22	lb/day	169.74	1,289.88	76.80	-	70.65	-	129,688.77	lb/yr	-	-	-	Activity Period (days) =	40.0		
Off-Highway Truck(s)	3		0.30	2.76	0.10	0.10	324.22	lb/day	35.60	331.39	12.44	-	11.45	-	38,906.66	lb/yr	-	-	-				
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	34.19	266.47	15.39	-	14.16	-	24,572.61	lb/yr	-	-	-				
Compactor(s)	2		0.29	1.80	0.09	0.08	244.59	lb/day	22.90	143.86	6.85	-	6.30	-	19,567.08	lb/yr	-	-	-				
Employee Trips	15	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	13.80	17.40	2.40	-	2.31	-	23,553.00	lb/yr	-	-	-				
Fugitive Sources																							
Travel on unpaved roads	60	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	53.86	-	5.04	-	lb/yr	-	-	-	-	-	
Travel on paved roads	60	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	16.94	-	2.49	-	lb/yr	-	-	-	-	-	
Total Emissions (lb/year) =			406.09	3,214.28	173.82	70.81	160.02	7.53	357,993.40	lb/yr													
Total Emissions (lb/day) =			10.15	80.36	4.35	1.77	4.00	0.19	8,949.83	lb/day													

Summary - City of Sacramento Pumping Plants		ROG	NOX	PM10		PM2.5		CO2
2013 Total from City of Sacramento Pumping Plants (tons/year) =		0.6	4.8	0.3	0.1	0.2	0.0	537.0
2013 Total from City of Sacramento Pumping Plants (lb/day) - Worst Case =		10.2	80.4	4.3	1.8	4.0	0.2	8949.8

*These calculations represent worst-case emissions from construction activities associated with City of Sacramento Pumping Plant work

Year	Pumping Plant	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2013	City Sump 160	10.2	80.4	4.3	1.8	4.0	0.2	8949.8
	City Sump 58	10.2	80.4	4.3	1.8	4.0	0.2	8949.8
	City Sump 102	10.2	80.4	4.3	1.8	4.0	0.2	8949.8
	Worst-case lb/day =	10.2	80.4	4.3	1.8	4.0	0.2	8949.8

Table 15: Triangle Borrow Site Excavation (PGCC/NEMDC) - Phase 4b Improvements

Project Information

Phase 4b Triangle Borrow Site Excavation includes excavation and rehabilitation of Triangle Area Borrow Site

Work Schedule: May - Nov, 2014

Total Triangle Area Borrow Site work length in Phase 4b =	5.0	mi		
	26400.0	ft		
Triangle Borrow Site length in Sutter County =	26400.0	ft	100.0%	of the total length
			0.002204623	lb/gram
			2000	lb/ton

	Qty	Unit	Emission Factor							Emissions (lb/yr)							Unit	Input Data
			ROG	NOx	PM10	PM2.5	CO2	Unit	ROG	NOx	PM10		PM2.5		CO2			
											COMB	EM	COMB	EM				
[1] Triangle Area Borrow Site Excavation																		
Mobile Sources																		
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	112.00	1,422.40	56.00	-	51.52	-	183,086.40	lb/yr	Amount Available for Excavation (acres) = 290.0	
Loader(s)	2		0.43	3.33	0.19	0.18	307.16	lb/day	119.67	932.65	53.87	-	49.56	-	86,004.15	lb/yr	Activity Period (days) = 140.0	
Bulldozer(s)	2		0.46	4.06	0.17	0.16	335.60	lb/day	128.21	1,136.42	48.46	-	44.59	-	93,967.39	lb/yr		
Excavator(s)	2		0.42	3.22	0.19	0.18	324.22	lb/day	118.82	902.91	53.76	-	49.46	-	90,782.14	lb/yr		
Employee Trips	20	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	64.40	81.20	11.20	-	10.80	-	109,914.00	lb/yr		
Fugitive Sources																		
Disturbed Acreage	290	lb/day	-	-	10.00	-	-	lb/acre/day	-	-	-	-	2,900.00	-	-	lb/yr		
Material Handling																		
Bulldozing	8	hr/day	-	-	0.75	0.11	-	lb/hr	-	-	-	843.00	-	118.03	-	lb/yr		
Total Emissions (lb/year) =									543.10	4,475.58	223.30	3,743.09	205.93	118.03	563,754.08	lb/yr		
Total Emissions (lb/day) =									3.88	31.97	1.59	26.74	1.47	0.84	4,026.81	lb/day		
[2] Habitat Conservation, Borrow Site Restoration																		
Mobile Sources																		
Bulldozer	1		0.41	3.46	0.14	0.13	335.60	lb/day	12.19	103.74	4.30	-	3.96	-	10,067.94	lb/yr	Activity Period (days) = 30.0	
Water Truck(s)	1		0.10	1.27	0.05	0.05	163.47	lb/day	3.00	38.10	1.50	-	1.38	-	4,904.10	lb/yr		
Excavator(s)	1		0.35	2.59	0.15	0.14	324.22	lb/day	10.50	77.58	4.46	-	4.10	-	9,726.66	lb/yr		
Off-Highway Truck(s)	1		0.26	2.13	0.08	0.07	324.22	lb/day	7.75	63.88	2.26	-	2.08	-	9,726.66	lb/yr		
Employee Trips	10	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	6.90	8.70	1.20	-	1.16	-	11,776.50	lb/yr		
Total Emissions (lb/year) =									40.34	292.00	13.72	-	12.67	-	46,201.85	lb/yr		
Total Emissions (lb/day) =									1.34	9.73	0.46	-	0.42	-	1,540.06	lb/day		

Summary - Triangle Properties Borrow Area Excavation		ROG	NOx	PM10		PM2.5		CO2
		COMB	EM	COMB	EM	COMB	EM	
2014 Total from Triangle Properites Borrow Area Excavation (tons/year) =		0.3	2.4	0.1	1.9	0.1	0.1	305.0
2014 Total from Triangle Properties Borrow Area Excavation (lb/day) - Worst Case =		3.9	32.0	1.6	26.7	1.5	0.8	4026.8

*These calculations represent worst-case emissions from construction activities associated with Triangle Properties Borrow Area Excavation work

Year	Phase	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2014	1	3.88	31.97	1.59	26.74	1.47	0.84	4,026.81
	2	1.34	9.73	0.46	-	0.42	-	1,540.06
Worst-case lb/day =		3.88	31.97	1.59	26.74	1.47	0.84	4,026.81

Table 16: South Fisherman's Lake Borrow Area and West Lakeside School Site (ARNL/SREL) - Phase 4b Improvements

Project Information

Phase 4b South Fisherman's Lake Borrow Area and West Lakeside School Site includes excavation and rehabilitation of sites
 Work Schedule: May - Nov, 2014

Total Borrow Site work length in Phase 4b =	1.0	mi
	5280.0	ft
Borrow Site length in Sacramento County =	5280.0	ft
	100.0% of the total length	
	0.002204623	lb/gram
	2000	lb/ton

	Qty	Unit	Emission Factor							Emissions (lb/yr)							Input Data
			ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10		PM2.5		CO2	Unit	
											COMB	EM	COMB	EM			
[1] South Fisherman's Lake Borrow Site Excavation																	
Mobile Sources																	
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	112.00	1,422.40	56.00	-	51.52	-	183,086.40	lb/yr	Amount Available for Excavation (acres) - 610 South Main = 119.0
Loader(s)	2		0.38	2.93	0.17	0.16	307.16	lb/day	106.46	821.35	47.32	-	43.53	-	86,004.13	lb/yr	Amount Available for Excavation (acres) - Los Rios Community College = 95.0
Bulldozer(s)	2		0.42	3.65	0.15	0.14	335.60	lb/day	118.47	1,021.78	42.84	-	39.41	-	93,967.50	lb/yr	Activity Period (days) = 140.0
Excavator(s)	2		0.37	2.78	0.16	0.15	324.22	lb/day	104.52	779.24	46.14	-	42.45	-	90,782.13	lb/yr	
Employee Trips	20	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	64.40	81.20	11.20	-	10.80	-	109,914.00	lb/yr	
Fugitive Sources																	
Disturbed Acreage	214	acres	-	-	10.00	-	-	lb/acre/day	-	-	-	-	2,140.00	-	-	lb/yr	
Material Handling																	
Bulldozing	8	hr/day	-	-	0.75	0.11	-	lb/hr	-	-	-	-	843.00	-	118.03	lb/yr	
Total Emissions (lb/year) =										505.85	4,125.97	203.50	2,983.09	187.72	118.03	563,754.16	lb/yr
Total Emissions (lb/day) =										3.61	29.47	1.45	21.31	1.34	0.84	4,026.82	lb/day
[2] Habitat Conservation, Borrow Site Restoration																	
Mobile Sources																	
Bulldozer	1		0.41	3.46	0.14	0.13	335.60	lb/day	12.19	103.74	4.30	-	3.96	-	10,067.94	lb/yr	Activity Period (days) = 30.0
Water Truck(s)	1		0.10	1.27	0.05	0.05	163.47	lb/day	3.00	38.10	1.50	-	1.38	-	4,904.10	lb/yr	
Excavator(s)	1		0.35	2.59	0.15	0.14	324.22	lb/day	10.50	77.58	4.46	-	4.10	-	9,726.66	lb/yr	
Off-Highway Truck(s)	1		0.26	2.13	0.08	0.07	324.22	lb/day	7.75	63.88	2.26	-	2.08	-	9,726.66	lb/yr	
Employee Trips	10	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	6.90	8.70	1.20	-	1.16	-	11,778.50	lb/yr	
Total Emissions (lb/year) =										40.34	292.00	13.72	-	12.67	-	46,201.85	lb/yr
Total Emissions (lb/day) =										1.34	9.73	0.46	-	0.42	-	1,540.06	lb/day
[3] West Lakefield School Borrow Site Excavation																	
Mobile Sources																	
Water Truck(s)	8		0.10	1.27	0.05	0.05	163.47	lb/day	56.00	711.20	28.00	-	25.76	-	91,543.20	lb/yr	Amount Available for Excavation (acres) = 20.0
Loader(s)	2		0.38	2.93	0.17	0.16	307.16	lb/day	53.23	410.68	23.66	-	21.77	-	43,002.06	lb/yr	Activity Period (days) = 70.0
Bulldozer(s)	2		0.42	3.65	0.15	0.14	335.60	lb/day	59.23	510.89	21.42	-	19.71	-	46,983.75	lb/yr	
Excavator(s)	2		0.37	2.78	0.16	0.15	324.22	lb/day	52.26	389.62	23.07	-	21.23	-	45,391.07	lb/yr	
Employee Trips	20	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	32.20	40.60	5.60	-	5.40	-	54,957.00	lb/yr	
Fugitive Sources																	
Disturbed Acreage	20	lb/day	-	-	10.00	-	-	lb/acre/day	-	-	-	-	200.00	-	-	lb/yr	
Material Handling																	
Bulldozing	8	hr/day	-	-	0.75	0.11	-	lb/hr	-	-	-	-	421.55	-	59.02	lb/yr	
Total Emissions (lb/year) =										252.92	2,062.98	101.75	621.55	93.86	59.02	281,877.08	lb/yr
Total Emissions (lb/day) =										3.61	29.47	1.45	8.88	1.34	0.84	4,026.82	lb/day
[4] Habitat Conservation, Borrow Site Restoration																	
Mobile Sources																	
Bulldozer	1		0.41	3.46	0.14	0.13	335.60	lb/day	12.19	103.74	4.30	-	3.96	-	10,067.94	lb/yr	Activity Period (days) = 30.0
Water Truck(s)	1		0.10	1.27	0.05	0.05	163.47	lb/day	3.00	38.10	1.50	-	1.38	-	4,904.10	lb/yr	
Excavator(s)	1		0.35	2.59	0.15	0.14	324.22	lb/day	10.50	77.58	4.46	-	4.10	-	9,726.66	lb/yr	
Off-Highway Truck(s)	1		0.26	2.13	0.08	0.07	324.22	lb/day	7.75	63.88	2.26	-	2.08	-	9,726.66	lb/yr	
Employee Trips	10	employees	0.02	0.03	0.00	0.00	39.26	lb/day/empl	6.90	8.70	1.20	-	1.16	-	11,778.50	lb/yr	
Total Emissions (lb/year) =										40.34	292.00	13.72	-	12.67	-	46,201.85	lb/yr
Total Emissions (lb/day) =										1.34	9.73	0.46	-	0.42	-	1,540.06	lb/day

Summary - South Fisherman's Borrow Area and West Lakeside School Site Excavation		ROG	NOX	PM10		PM2.5		CO2
2014 Total from Borrow Site Excavation (tons/year) =		0.4	3.4	0.2	1.8	0.2	0.1	469.0
2014 Total from Borrow Site Excavation (lb/day) - Worst Case =		3.6	29.5	1.5	21.3	1.3	0.8	4026.8

*These calculations represent worst-case emissions from construction activities associated with South Fisherman's Borrow Area and West Lakeside School Site excavation work

Year	Phase	Emissions (lb/day)						
		ROG	NOx	PM10		PM2.5		CO2
				COMB	EM	COMB	EM	
2014	1	3.61	29.47	1.45	21.31	1.34	0.84	4,026.82
	2	1.34	9.73	0.46	-	0.42	-	1,540.06
	3	3.61	29.47	1.45	8.88	1.34	0.84	4,026.82
	4	1.34	9.73	0.46	-	0.42	-	1,540.06
Worst-case lb/day =		3.61	29.47	1.45	21.31	1.34	0.84	4,026.82

Table 17a: Sutter County NLP Phase 4b Emissions									
Unmitigated 2012 Emissions									
Significant before offset payment?	No	Yes	No	No	No	Yes	-	-	-
1. Implementation of a FRACMD-approved Fugitive Dust Plan will reduce emissions of PM10 and PM2.5 by 85-90%; enhanced fugitive dust control measures including use of chemical stabilizers will be used during activities with high levels of earthmoving activities.									

Table 17b: Sacramento County NLP Phase 4b Emissions												
Unmitigated 2012 Emissions												
% Reduction	5%		40%		45%		90%		5%		40%	
	5%	40%	45%	90%	45%	90%	5%	40%	45%	90%	45%	90%
			3.7	75.7	19.4	7.7						
TOTAL	22.5	81.9	79.4		27.0		1.9	6.9	6.2		1.7	
Threshold	-	85	-		-		25	25	100		100	
Significant before offset payment?	-	No	-		-		No	No	No		No	
1. Implementation of a SACMD-approved Fugitive Dust Plan will reduce emissions of PM10 and PM2.5 by 85-90%; enhanced fugitive dust control measures including use of chemical stabilizers will be used during activities with high levels of earthmoving activities.												

Table 18: Fix-In-Place Alternative - Phase 4b Improvements

Phase 4b Fix-In-Place Alternative includes levee widening, rehabilitation, and seepage remediation																
Pallet Loader(s) [Forklifts]	10		1.71	10.55	0.96	0.89	1,023.86	lb/day	1,023.84	6,327.72	577.26	-	531.08	-	614,315.16	lb/yr
Generator(s)	10		0.73	9.76	0.28	0.26	1,262.76	lb/day	439.56	5,853.60	167.76	-	154.34	-	757,655.28	lb/yr
Pump(s)	10		1.97	13.08	1.06	0.97	1,262.76	lb/day	1,179.36	7,847.82	634.32	-	583.57	-	757,655.46	lb/yr
Pickup(s) ³	8		0.03	0.04	0.01	0.01	58.88	lb/day	16.56	20.88	2.88	-	2.78	-	28,263.60	lb/yr
Excavator(s)	6		0.37	8.35	0.49	0.45	972.67	lb/day	134.39	3,005.64	177.98	-	163.75	-	350,159.65	lb/yr
Deep Soil Mix Rig	10		0.19	5.40	0.18	0.16	1,279.82	lb/day	111.18	3,240.36	107.46	-	98.86	-	767,894.22	lb/yr
Employee Trips	120	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	165.60	208.80	28.80	-	27.76	-	282,636.00	lb/yr
Fugitive Sources																
Travel on unpaved roads	960	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	861.80	-	80.72	lb/yr
Travel on paved roads	960	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	271.08	-	39.83	lb/yr
Material Handling																
Bulldozing	24	hrs/day	-	-	0.75	0.11	-	lb/day	-	-	-	-	1,083.98	-	151.76	lb/yr
Total Emissions (lb/year) =									5,294.4	44,989.0	2,554.1	2,216.9	2,351.2	272.3	5,327,660.0	lb/yr
Total Emissions (lb/day) =									88.2	749.8	42.6	36.9	39.2	4.5	88,794.3	lb/day
[5] Reconstruct Garden Hwy at one intersection (concurrent with 5 and 6)																
Mobile Sources																
Haul Truck(s)	3	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile ²	0.9	11.3	0.4	-	0.4	-	1,320.0	lb/yr
Haul Truck(s)	81	trips	10.74	0.00	0.02	0.01	209.04	g/trip ²	1.9	0.0	0.0	-	0.0	-	37.3	lb/yr
Backhoe(s)	1		0.18	1.19	0.05	0.04	312.85	lb/day	5.0	32.2	1.2	-	1.1	-	8446.8	lb/yr
Smooth Drum Compactor(s)	1		0.28	1.78	0.07	0.07	244.59	lb/day	7.7	48.1	1.9	-	1.8	-	6603.9	lb/yr
Off-Highway Truck(s)	1		0.27	2.32	0.08	0.08	324.22	g/mile	0.2	1.7	0.1	-	0.1	-	231.6	lb/yr
Truck Mounter Auger(s)	1		0.27	2.32	0.08	0.08	324.22	lb/day	7.3	62.8	2.3	-	2.1	-	8754.0	lb/yr
Paver(s)	1		0.75	4.48	0.40	0.36	352.66	lb/day	29.2	121.0	10.7	-	9.8	-	9521.9	lb/yr
Employee Trips	60	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	37.3	47.0	6.5	-	6.2	-	63593.1	lb/yr
Fugitive Sources																
Travel on unpaved roads	162	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	145.4	-	13.6	lb/yr
Travel on paved roads	162	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	45.7	-	6.7	lb/yr
Total Emissions (lb/year) =									80.4	323.9	23.1	191.2	21.6	20.3	98,508.6	lb/yr
Total Emissions (lb/day) =									3.0	12.0	0.9	7.1	0.8	0.8	3,648.5	lb/day
[6] Site Restoration/Demobilization																
Mobile Sources																
Haul Truck(s)	2	trucks	1.19	15.82	0.62	0.57	1,847.96	g/mile	0.72	9.49	0.37	-	0.34	-	1,108.14	lb/yr
Haul Truck(s)	68	trips	10.74	-	0.02	0.01	209.04	g/trip	1.61	-	0.00	-	0.00	-	31.34	lb/yr
Off-Highway Truck(s)	3		0.27	2.32	0.08	0.08	324.22	lb/day	27.48	236.57	8.57	-	7.88	-	33,070.63	lb/yr
Water Truck(s)	3		0.10	1.27	0.05	0.05	163.47	lb/day	10.20	129.54	5.10	-	4.69	-	16,673.94	lb/yr
Employee Trips	60	employees	0.02	0.03	0.00	0.00	39.26	lb/day/emp	46.92	59.16	8.16	-	7.87	-	80,080.20	lb/yr
Fugitive Sources																
Travel on unpaved roads	136	VMT/yr	-	-	0.90	0.08	-	lb/VMT	-	-	-	-	122.09	-	11.44	lb/yr
Travel on paved roads	136	VMT/yr	-	-	0.28	0.04	-	lb/VMT	-	-	-	-	38.40	-	5.64	lb/yr
Total Emissions (lb/year) =									86.9	434.8	22.2	160.5	20.8	17.1	130,964.3	lb/yr
Total Emissions (lb/day) =									2.6	12.8	0.7	4.7	0.6	0.5	3,851.9	lb/day
Summary - Fix-In-Place SREL Reaches 16-20																
2013 Total from Fix-In-Place SREL Reaches 16-19A (tons/year) =									50.0%	2.7	19.9	1.0	42.6	0.9	4.8	2454.5
2013 Total from Fix-In-Place SREL Reaches 16-19A Worst-Case Day (lb/day) =									50.0%	44.1	374.9	21.3	592.8	19.6	66.2	44397.2
2014 Total from Fix-In-Place SREL Reaches 19B-20 (tons/year) =									50.0%	2.7	19.9	1.0	42.6	0.9	4.8	2454.5
2014 Total from Fix-In-Place SREL Reaches 19B-20 Worst-Case Day (lb/day) =									50.0%	44.1	374.9	21.3	592.8	19.6	66.2	44397.2

*These calculations represent worst-case emissions from construction activities associated with Fix-In-Place Alternative work.

*Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes
 Notes:
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)
 3. Pickup truck use is assumed to be half of the work day (~12 hours of use); emission factor times 1.5 to represent 12 hours of operation/day

Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
-	-	-	4.0	324.00	12.00
				Activity Period (days) =	27.0

*Assumes haul load is approximately 4 miles roundtrip
 *Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes
 Notes:
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)

Import/ Export	Qty (CY)	# of Haul Loads	Round-trip (miles)	Total Miles	Total Miles/day
-	-	-	4.0	272.00	8.00
				Activity Period (days) =	34.0

*Assumes haul load is approximately 4 miles roundtrip
 *Assumes that haul truck travel occurs on 50% paved and 50% unpaved haul routes
 Notes:
 1. Emission factor represents running exhaust (grams/mile)
 2. Emission factor represents start emission rate @ 480 minutes (grams/trip)

Year	Group	Phase	Emissions (lb/day)						
			ROG	NOx	PM10		PM2.5		CO2
					COMB	EM	COMB	EM	
2013 - Fix-In-Place Reaches 16-20	I	1	8.9	72.7	3.5	23.6	3.2	2.5	9304.7
		2	8.4	89.7	3.8	56.6	3.5	6.0	11530.9
		Total	17.4	162.5	7.3	80.2	6.7	8.5	20835.7
	II	3	33.9	213.5	9.4	1185.6	8.7	132.4	26663.0
		Total	33.9	213.5	9.4	1185.6	8.7	132.4	26663.0
		Total	88.2	749.8	42.6	36.9	39.2	4.5	88794.3
	IV	5	3.0	12.0	0.9	7.1	0.8	0.8	3648.5
		6	2.6	12.8	0.7	4.7	0.6	0.5	3851.9
		Total	5.5	24.8	1.5	11.8	1.4	1.3	7500.4
		Worst-case lb/day =	88.2	749.8	42.6	1185.6	39.2	132.4	88794.3

Table 19a: Sutter County NLP Phase 4b Emissions									
Unmitigated 2012 Emissions									
Significant before offset payment?	No	Yes	No	No	No	Yes	-	-	-
1. Implementation of a FRAQMD-approved Fugitive Dust Plan will reduce emissions of PM10 and PM2.5 by 85-90%; enhanced fugitive dust control measures including use of chemical stabilizers will be used during activities with high levels of earthmoving activities.									

Table 19b: Sacramento County NLP Phase 4b Emissions												
Unmitigated 2012 Emissions												
% Reduction	5%	40%	45%	90%	45%	90%	5%	40%	45%	90%	45%	90%
			3.7	75.7	19.4	7.7			0.3	5.9	1.0	0.6
TOTAL	22.5	81.9	79.4		27.0		1.9	6.9	6.2		1.7	1293.83
Threshold	-	85	-		-		25	25	100		100	-
Significant before offset payment?	-	No	-		-		No	No	No		No	-
1. Implementation of a SMAGMD-approved Fugitive Dust Plan will reduce emissions of PM10 and PM2.5 by 85-90%; enhanced fugitive dust control measures including use of chemical stabilizers will be used during activities with high levels of earthmoving activities.												

Table 19c: Fix-In-Place Summary, Unmitigated Emissions (Includes activities within Sutter and Sacramento Counties)													
Year	Worst-Case lb/day		Tons/year										
	ROG	NOx	PM10		PM2.5		ROG	NOx	PM10		PM2.5		CO2
			Comb.	EM	Comb.	EM			Comb.	EM	Comb.	EM	
2012	27.32	235.48	12.22	912.52	11.26	105.06	1.18	8.46	0.43	40.34	6.30	50.19	997.40
2013	81.93	662.47	37.11	1062.53	34.18	125.27	4.23	31.79	1.67	65.41	1.54	7.30	3908.79
2014	65.19	546.73	42.54	809.01	28.80	87.92	3.65	27.86	1.61	48.59	1.23	4.90	3508.46
2015	81.18	618.07	32.39	724.65	29.81	82.88	3.68	25.15	1.24	28.09	15.49	11.65	3046.91
2016	46.06	265.73	13.19	1472.54	68.51	149.27	3.91	22.30	1.05	114.08	3.66	12.54	2517.33

█ *Represents peak day/year

Table 19d: Fix-In-Place Summary, Mitigated Emissions (Included activities within Sutter and Sacramento Counties)													
Year	Worst-Case lb/day		Tons/year										
	ROG	NOx	PM10		PM2.5		ROG	NOx	PM10		PM2.5		CO2
			Comb.	EM	Comb.	EM			Comb.	EM	Comb.	EM	
2012	25.9	141.3	6.7	136.9	6.2	15.8	1.1	5.1	0.4	33.2	0.2	0.7	997.4
2013	77.8	397.5	20.4	159.4	18.8	18.8	4.0	19.1	0.9	9.8	0.8	1.1	3908.8
2014	61.9	328.0	23.4	121.4	15.8	13.2	3.5	16.7	8.2	0.0	0.7	0.8	3508.5
2015	77.1	370.8	17.8	108.7	33.8	18.9	3.5	15.1	4.9	0.0	0.6	0.5	3046.9
2016	43.8	159.4	7.3	147.3	37.7	14.9	3.7	13.4	12.0	0.0	2.0	1.3	2517.3

█ *Represents peak day/year

Table 20: Phase 2 NLIP Emissions Summary

Mitigated 2008 Emissions															
Sutter County	Worst-Case lb/day			Tons/year				Sacramento County	Worst-Case lb/day			Tons/year			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2*		ROG	NOX	PM10	ROG	NOX	PM10	CO2*
TOTAL	160.4	697.4	920.7	8.8	39.8	67.3	-	TOTAL	37.3	144.0	142.2	1.7	7.4	6.3	-
Mitigated 2010 Emissions															
Sutter County	Worst-Case lb/day			Tons/year				Sacramento County	Worst-Case lb/day			Tons/year			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2*		ROG	NOX	PM10	ROG	NOX	PM10	CO2*
TOTAL	15.7	66.6	131.2	0.7	3.3	7.1	-	TOTAL	5.6	21.6	21.3	0.2	1.1	0.9	-

*CO2 was not evaluated in Phase 2

Phase 3 NLIP Emissions Summary

Mitigated 2009 Emissions (100% could occur in 2010)															
Sutter County	Worst-Case lb/day			Tons/year				Sacramento County	Worst-Case lb/day			Tons/year			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2		ROG	NOX	PM10	ROG	NOX	PM10	CO2
TOTAL	74.6	413.3	971.4	7.4	43.7	94.3	2740.9	TOTAL	93.3	498.7	1283.3	6.0	33.0	89.0	1876.8

"No Action Alternative" Emissions Summary (Phase 2 and 3 only)

	Sutter County								Sacramento County						
	Worst-Case lb/day			Tons/yr					Worst-Case lb/day			Tons/yr			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2		ROG	NOX	PM10	ROG	NOX	PM10	CO2
2008 Max Total	160.4	697.4	920.7	8.8	39.8	67.3	-	2008 Max Total	37.3	144.0	142.2	1.7	7.4	6.3	-
2009 Max Total	74.6	413.3	971.4	7.4	43.7	94.3	2740.9	2009 Max Total	93.3	498.7	1283.3	6.0	33.0	89.0	1876.8
2010 Max Total*	90.3	479.8	1102.6	8.1	47.1	101.4	2740.9	2010 Max Total*	98.9	520.3	1304.6	6.3	34.1	89.9	1876.8

*Assumes 100% of Phase 3 is conducted in 2010

*Assumes 100% of Phase 3 is conducted in 2010

Table 22: Phase 4b - SMAQMD Offset Mitigation Fee Summary

1. For both residential and non-residential acreage entries EXCLUDE ONLY undisturbed (not graded) Open Space.
2. Append this calculation sheet to the environmental document.
3. Unmitigated NOx (lbs/day) and duration (days) should be consistent with URBEMIS results.

Construction Emissions Mitigation Fee Calculation						
PART 1: PROJECT INFORMATION						
Project Name:		SAFCA - Phase 4b - 2011 NLIP Construction Emissions within SMAQMD's Jurisdiction				
PART 2: EMISSIONS INFORMATION						
Year	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
2012	ARNL Reaches 1-4	144.01	86.41	1.41	27	38.04
Total project Nox over threshold (lbs)			38.04			
Total project Nox over threshold (tons)			0.02			
PART 3: MITIGATION FEE RESULTS						
TOTAL MITIGATION FEE (\$16,400/TON)**		\$312				
Administrative Fee (5%)		\$16				
TOTAL MITIGATION FEE		\$328				
>>> Fee is to be paid to the SMAQMD prior to any ground disturbance either in total or on a by acre basis.						
* Assumes a construction mitigation plan which achieves a 40% reduction in NOx from on-site, off-road equipment.						
** Or the \$/ton of NOx cost-effectiveness value in effect at the time the fee is collected.						

PART 2: EMISSIONS INFORMATION						
Year	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
2013	ARNL Reaches 1-4	169.34	101.60	16.60	60	996.20
2013	West Drainage Canal	37.86	22.72	22.72	28	636.16
2013	City of Sacramento Pumps	80.36	48.21	48.21	40	1928.40
2013	SREL Reaches 16-20 - Initial 50%	374.91	224.95	224.95	30	6748.50
2013	Total Activities =					10309.26
Total project Nox over threshold (lbs)			10309.26			
Total project Nox over threshold (tons)			5.15			
PART 3: MITIGATION FEE RESULTS						
TOTAL MITIGATION FEE (\$16,400/TON)**		\$84,536				
Administrative Fee (5%)		\$4,227				
TOTAL MITIGATION FEE		\$88,763				
>>> Fee is to be paid to the SMAQMD prior to any ground disturbance either in total or on a by acre basis.						
* Assumes a construction mitigation plan which achieves a 40% reduction in NOx from on-site, off-road equipment.						
** Or the \$/ton of NOx cost-effectiveness value in effect at the time the fee is collected.						

PART 2: EMISSIONS INFORMATION						
Year	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
2014	SREL Reaches 16-20 - Remaining 50%	374.91	224.95	139.95	30	4198.35
2014	Lakeside School Borrow Site	29.47	17.68	17.68	140	2475.58
2014	Total Activities =					6673.94
Total project Nox over threshold (lbs)			6673.94			
Total project Nox over threshold (tons)			3.34			
PART 3: MITIGATION FEE RESULTS						
TOTAL MITIGATION FEE (\$16,400/TON)**		\$54,726				
Administrative Fee (5%)		\$2,736				
TOTAL MITIGATION FEE		\$57,463				
>>> Fee is to be paid to the SMAQMD prior to any ground disturbance either in total or on a by acre basis.						
* Assumes a construction mitigation plan which achieves a 40% reduction in NOx from on-site, off-road equipment.						
** Or the \$/ton of NOx cost-effectiveness value in effect at the time the fee is collected.						

PART 2: EMISSIONS INFORMATION						
Year	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
2015	District 1000 Pumping Plants	80.36	48.21	48.21	120	5785.70
2015	NEMDC South - Levee Raise	482.84	289.70	204.70	14	2917.04
2015	NEMDC South - Waterside	19.69	11.81	11.81	14	168.70
2015	Total Activities =					8871.45
Total project Nox over threshold (lbs)			8871.45			
Total project Nox over threshold (tons)			4.44			
PART 3: MITIGATION FEE RESULTS						
TOTAL MITIGATION FEE (\$16,400/TON)**		\$72,746				

Table 22: Phase 4b - SMAQMD Offset Mitigation Fee Summary

Administrative Fee (5%)	\$3,637
TOTAL MITIGATION FEE	\$76,383
>>> <i>Fee is to be paid to the SMAQMD prior to any ground disturbance either in total or on a by acre basis.</i>	
* Assumes a construction mitigation plan which achieves a 40% reduction in NOx from on-site, off-road equipment.	
** Or the \$/ton of NOx cost-effectiveness value in effect at the time the fee is collected.	

PART 2: EMISSIONS INFORMATION						
Year	Activity Phase	NOx (lbs/day) unmitigated	NOx (lbs/day) mitigated*	NOx over threshold (lbs/day)	duration (days)	Total significant NOx (lbs)
2016	NEMDC North	136.58	81.95	0	85	0.00
Total project Nox over threshold (lbs)			0.00			
Total project Nox over threshold (tons)			0.00			

PART 3: MITIGATION FEE RESULTS	
TOTAL MITIGATION FEE (\$16,400/TON)**	\$0
Administrative Fee (5%)	\$0
TOTAL MITIGATION FEE	\$0
>>> <i>Fee is to be paid to the SMAQMD prior to any ground disturbance either in total or on a by acre basis.</i>	
Mitigation Fee (\$/acre)	-
* Assumes a construction mitigation plan which achieves a 40% reduction in NOx from on-site, off-road equipment.	
** Or the \$/ton of NOx cost-effectiveness value in effect at the time the fee is collected.	

Phase 4b - SMAQMD Mitigation Fee Summary	
Year	Fee Total
2012	\$328
2013	\$88,763
2014	\$57,463
2015	\$76,383
2016	\$0
TOTAL =	\$222,936

Equipment Type	Emission Rates for Year 2010						ROG	NOX	PM10	PM2.5	CO2	Unit
	ROG	NOX	PM10	PM2.5	CO2	Unit						
Employee Light-Duty Trucks	0.023	0.029	0.004	0.004	39.255	lb/day/employee						
Haul Trucks	1.19	15.82	0.62	0.57	1847.96	g/mile	11.60	8.19	0.016	0.014	223.55	g/trip
Backhoes	0.2057	1.3752	0.0650	0.0598	312.8457	lb/day						
Bore/Drill Rigs	0.2041	2.3385	0.0841	0.0774	426.6076	lb/day						
Compactor	0.2862	1.7983	0.0856	0.0787	244.5886	lb/day						
Concrete/Industrial Saws	0.5051	3.2230	0.1580	0.1454	415.2317	lb/day						
Cranes	0.2472	2.4061	0.0929	0.0855	244.5885	lb/day						
Crawler Tractors	0.5212	4.8719	0.2034	0.1871	369.7268	lb/day						
Crushing/Proc. Equipment	0.6290	4.9396	0.2837	0.2610	443.6723	lb/day						
Dozer	0.4579	4.0586	0.1731	0.1592	335.5978	lb/day						
Excavator	0.4244	3.2247	0.1920	0.1766	324.2219	lb/day						
Forklifts, Rough Terrain	0.6643	4.0071	0.3701	0.3405	341.2864	lb/day						
Generator	0.2894	3.7816	0.1139	0.1048	420.9198	lb/day						
Grader	0.4893	3.7944	0.2197	0.2021	346.9744	lb/day						
Loaders, Rubber Tired	0.4274	3.3309	0.1924	0.1770	307.1577	lb/day						
Off-Highway Trucks	0.2966	2.7615	0.1037	0.0954	324.2222	lb/day						
Other Construction Equip.	0.5774	3.7753	0.3236	0.2977	352.6627	lb/day						
Pavers	0.8357	4.9393	0.4357	0.4008	352.6628	lb/day						
Paving Equipment	0.7097	4.2031	0.3702	0.3406	301.4698	lb/day						
Pump	0.7626	4.9115	0.3956	0.3639	420.9197	lb/day						
Rollers	0.6495	3.9873	0.3469	0.3191	318.5338	lb/day						
Scraper	0.4645	4.3611	0.1762	0.1621	409.5438	lb/day						
Signal Boards	1.8307	4.5214	0.4462	0.4105	443.6723	lb/day						
Skid Steer Loaders	0.9654	3.0209	0.2663	0.2450	312.8459	lb/day						
Surfacing Equipment	0.2142	2.3732	0.0856	0.0788	255.9648	lb/day						
Tractors	0.2057	1.3752	0.0650	0.0598	312.8457	lb/day						
Trenchers	0.9928	5.9689	0.5107	0.4698	426.6079	lb/day						
Water Trucks	0.10	1.27	0.05	0.0460	163.47	lb/day						
Fugitive Dust			10			lb/acre/day						
Assumptions: Emission factors from the Road Construction Emissions Model, Version 6.3.2 (SMAQMD 2009) for model year 2010 which assumes equipment operates 8hrs/day												
Equipment Type	Emission Rates for Year 2011						ROG	NOX	PM10	PM2.5	CO2	Unit
	ROG	NOX	PM10	PM2.5	CO2	Unit						
Employee Light-Duty Trucks	0.023	0.029	0.004	0.004	39.255	lb/day/employee						
Haul Trucks	1.19	15.82	0.62	0.57	1847.96	g/mile	11.23	8.015	0.015	0.015	271.220	g/trip
Backhoes	0.1936	1.2770	0.0547	0.05	312.8457	lb/day						
Bore/Drill Rigs	0.2041	2.3385	0.0841	0.08	426.6076	lb/day						
Compactor	0.2862	1.7983	0.0856	0.08	244.5886	lb/day						
Concrete/Industrial Saws	0.5051	3.2230	0.1580	0.15	415.2317	lb/day						
Cranes	0.2472	2.4061	0.0929	0.09	244.5885	lb/day						
Crawler Tractors	0.4819	4.4539	0.1858	0.17	369.7269	lb/day						
Crushing/Proc. Equipment	0.6290	4.9396	0.2837	0.26	443.6723	lb/day						
Dozer	0.4579	4.0586	0.1731	0.16	335.5978	lb/day						
Excavator	0.4244	3.2247	0.1920	0.18	324.2219	lb/day						
Forklifts, Rough Terrain	0.6643	4.0071	0.3701	0.34	341.2864	lb/day						
Generator	0.2894	3.7816	0.1139	0.10	420.9198	lb/day						

Equipment Type	Emission Rates for Year 2010						Unit	ROG	NOX	PM10	PM2.5	CO2	Unit
	ROG	NOX	PM10	PM2.5	CO2	Unit							
Grader	0.4893	3.7944	0.2197	0.20	346.9744	lb/day							
Loaders, Rubber Tired	0.4274	3.3309	0.1924	0.18	307.1577	lb/day							
Off-Highway Trucks	0.2966	2.7615	0.1037	0.10	324.2222	lb/day							
Other Construction Equip.	0.5774	3.7753	0.3236	0.30	352.6627	lb/day							
Pavers	0.8357	4.9393	0.4357	0.40	352.6628	lb/day							
Paving Equipment	0.7097	4.2031	0.3702	0.34	301.4698	lb/day							
Pump	0.7626	4.9115	0.3956	0.36	420.9197	lb/day							
Rollers	0.6495	3.9873	0.3469	0.32	318.5338	lb/day							
Scraper	0.4645	4.3611	0.1762	0.16	409.5438	lb/day							
Signal Boards	1.8307	4.5214	0.4462	0.41	443.6723	lb/day							
Skid Steer Loaders	0.9654	3.0209	0.2663	0.24	312.8459	lb/day							
Surfacing Equipment	0.2142	2.3732	0.0856	0.08	255.9648	lb/day							
Tractors	0.1936	1.2771	0.0547	0.05	312.8457	lb/day							
Trenchers	0.9928	5.9689	0.5107	0.47	426.6079	lb/day							
Water Trucks	0.10	1.27	0.05	0.05	163.47	lb/day							
Fugitive Dust			10			lb/acre/day							
Assumptions: Emission factors from the Road Construction Emissions Model, Version 6.3.2 (SMAQMD 2009) for model year 2011 which assumes equipment operates 8hrs/day													
Travel on Unpaved Haul Roads (Heavy Duty Trucks):													
$E(\text{lbs/VMT})=(k)(s/12)^a (W/3)^b$						$E(\text{lbs/VMT})=(k)(s/12)^a (W/3)^b$							
*AP-42 12/03, 13.2.2-4 eq 1a						*AP-42 12/03, 13.2.2-4 eq 1a							
Where:	PM10					PM2.5							
k =Particle Size Multiplier:	1.5	*AP-42 12/03 Table 13.2.2-2; PM10 emissions; industrial roads				k =Particle Size Multiplier:	0.15						
s =Silt Content:	4.3	*AP-42 12/03 Table 13.2.2-1, service road				s =Silt Content:	4.30						
empirical constants						empirical constants							
a	0.9	*AP-42 12/03 Table 13.2.2-2; PM10 emissions; industrial roads				a	0.90						
b	0.45	*AP-42 12/03 Table 13.2.2-2; PM10 emissions; industrial roads				b	0.45						
W =Vehicle Weight:	11.375	((2+1.25 T/cy*15 cy truck capacity) + 2)/2 (average weight of loaded and unloaded				W =Vehicle Weight:	11.38						
	1.08	lbs/VMT				$E(\text{ext})= E[(365-P)/365]$	0.10						
$E(\text{ext})= E[(365-P)/365]$		*AP-42 12/03 12.2.2-4 eq 2				Where:							
Where:						P =# days/yr with ≥ 0.01 in. precip	63						
P =# days/yr with ≥ 0.01 in. precip	63	*AP-42 12/03 Figure 13.2.2-1 for Sacramento Co/NOAA Technical Memorandum NWS WR-272; CLIMATE OF SACRAMENTO, CALIFORNIA (June 2005)					0.08						
	0.90	lbs/VMT											
Travel on Paved Haul Roads (Heavy Duty Trucks):													
$E(\text{lbs/VMT})=(k)(sL/2)^{.65} (W/3)^{1.5} - C$						$E(\text{lbs/VMT})=(k)(sL/2)^{.65} (W/3)^{1.5} - C$							
*AP-42 12/03, 13.2.1-4 eq 1						*AP-42 12/03, 13.2.1-4 eq 1							
Where:	PM10					PM2.5							
k =Particle Size Multiplier (lb/VMT)	0.016	*AP-42 12/03 Table 13.2.1-1; PM10 emissions; industrial roads				k =Particle Size Multiplier (lb/VMT)	0.0024						
sL =road surface silt loading (g/m ²)	8.2	*AP-42 12/03 Table 13.2.1-4; quarry roads				sL =road surface silt loading (g/m ²)	8.20						
W =Vehicle Weight:	11.375	((2+1.25 T/cy*15 cy truck capacity) + 2)/2 (average weight of loaded and unloaded				W =Vehicle Weight:	11.38						
C =exhaust, break, tire wear (lb/VMT)	0.00047	*AP-42 12/03 Table 13.2.1-2; PM10 emissions				C =exhaust, break, tire wear (lb/VMT)	0.00036						
	0.30	lbs/VMT					0.04						
$E(\text{ext})= E[1-(P/4N)]$		*AP-42 12/03 13.2.1 eq 2				Where:							
Where:						$E(\text{ext})= E[1-(P/4N)]$	12/03 13.2.1 eq 2						

Equipment Type	Emission Rates for Year 2010					Unit	ROG	NOX	PM10	PM2.5	CO2	Unit
	ROG	NOX	PM10	PM2.5	CO2							
$P=\# \text{ days/yr with } \geq 0.01 \text{ in. precip}$	63	*AP-42 12/03 Figure 13.2.2-1 for Sacramento Co/NOAA Technical Memorandum NWS WR-272; CLIMATE OF SACRAMENTO, CALIFORNIA (June 2005)					$P=\# \text{ days/yr with } \geq 0.01 \text{ in. precip}$	63				
$N=\text{number of days in averaging period}$	365										$N=\text{number of days in averaging period}$	365
	0.28	lbs/VMT					0.04					
Fugitive Dust Source Emissions												
	(lb/acre/day)											
Disturbance Area	60.71											
Assumptions: SMAQMD emission factor of 60.71 lbs/acre/day (SMAQMD 1994).												
Aggregate Storage Piles						Aggregate Storage Piles						
equipment traffic in storage area, 3. wind erosion of piles, 4. loadout of material through batch or drop operations (AP-42 12/03, chapt. 13.2.4).												
$E(\text{lb/ton})=(k)(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$	*AP-42 12/03, 13.2.4-3 eq 1					$E(\text{lb/ton})=(k)(0.0032)(U/5)^{1.3}/(M/2)^{1.4}$						
Where:	PM10					Where:	PM2.5					
$k=\text{Particle Size Multiplier:}$	0.35	*AP-42 12/03 13.2.4-3; PM10 emissions					$k=\text{Particle Size Multiplier:}$	0.053				
$U=\text{mean wind speed (mph)}$	8	station, CA RAWs data from 1996-2006 (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#CALIFORNIA)					$U=\text{mean wind speed (mph)}$	8				
$M=\text{moisture content (\%)}:$	2.4	*AP-42 7/98 Table 11.9-3, haul truck					$M=\text{moisture content (\%)}:$	2.4				
	0.0016	lbs/ton					0.00024					
Batch Loading at Borrow Area						Batch Loading at Borrow						
$E(\text{TSP}<15 \text{ um})=(.119/(M^{0.9}))$	*AP-42 7/98, Table 11.9-1					$E(\text{TSP}<15 \text{ um})=(.119/(M^{0.9}))$						
Where:	PM10					Where:	PM2.5					
$M=\text{moisture content (\%)}:$	2.4	*AP-42 7/98 Table 11.9-3, haul truck					$M=\text{moisture content (\%)}:$	2.4				
	0.05	lb/ton					0.05					
$E(\text{TSP}<10 \text{ um})=(E(\text{TSP}<15 \text{ um})*S)$	*AP-42 7/98, Table 11.9-1					$E(\text{TSP}<10 \text{ um})=(E(\text{TSP}<15 \text{ um})*S)$						
$S=\text{scaling factor}$	0.75	*AP-42 7/98 Table 11.9-3, haul truck					$S=\text{scaling factor}$	0.019				
	0.04	lb/ton					0.0010					
Truck Unloading						Truck Unloading						
$E(\text{TSP}<15 \text{ um})$	PM10					$E(\text{TSP}<15 \text{ um})$	PM2.5					
Where:	0.007	lb/ton	*AP-42 7/98 Table 11.9-4, end dump truck unloading (batch drop)					Where:	0.007			
$E(\text{TSP}<10 \text{ um})=(E(\text{TSP}<15 \text{ um})*S)$	*AP-42 7/98, Table 11.9-1					$E(\text{TSP}<10 \text{ um})=(E(\text{TSP}<15 \text{ um})*S)$						
$S=\text{scaling factor}$	0.75	*AP-42 7/98 Table 11.9-1, haul truck					$S=\text{scaling factor}$	0.019				
	0.005	lb/ton					0.0001					
Bulldozing						Bulldozing						
$E(\text{TSP}<15 \text{ um})=(1(s)^{1.5})/(M^{1.4})$	PM10	*AP-42 7/98, Table 11.9-1					$E(\text{TSP}<15 \text{ um})=(18.6(s)^{1.5})/(M^{1.4})$					
Where:						Where:						
$M=\text{moisture content (\%)}:$	7.9	*AP-42 7/98 Table 11.9-3, bulldozer					$M=\text{moisture content (\%)}:$	7.9				
$s=\text{silt content (\%)}:$	6.9	*AP-42 7/98 Table 11.9-3, bulldozer					$s=\text{silt content (\%)}:$	6.9				
	1.00	lb/hr					1.00					
$E(\text{TSP}<10 \text{ um})=(E(\text{TSP}<15 \text{ um})*S)$	*AP-42 7/98, Table 11.9-1					$E(\text{TSP}<10 \text{ um})=(E(\text{TSP}<15 \text{ um})*S)$						
$S=\text{scaling factor}$	0.75	*AP-42 7/98 Table 11.9-1, bulldozer					$S=\text{scaling factor}$	0.105				
	0.75	lb/hr					0.11					

Equipment Type	Emission Rates for Year 2012											
	ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10	PM2.5	CO2	Unit
Employee Light-Duty Tr	0.023	0.029	0.004	0.004	39.255	lb/day/employee						
Haul Trucks	1.19	15.82	0.62	0.57	1847.96	g/mile	10.736	7.788	0.015	0.01	209.04	g/trip
Backhoes	0.1841	1.1936	0.0462	0.04	312.8458	lb/day						
Bore/Drill Rigs	0.1853	1.8002	0.0597	0.05	426.6079	lb/day						
Compactor	0.2847	1.783	0.0712	0.07	244.5886	lb/day						
Concrete/Industrial Saw	0.5018	3.1773	0.1269	0.12	415.2319	lb/day						
Cranes	0.222	2.082	0.0775	0.07	244.5885	lb/day						
Crawler Tractors	0.4436	3.996	0.1637	0.15	369.7268	lb/day						
Crushing/Proc. Equipm	0.5551	4.3418	0.2515	0.23	443.6722	lb/day						
Dozer	0.4231	3.6492	0.153	0.14	335.5982	lb/day						
Excavator	0.3733	2.783	0.1648	0.15	324.2219	lb/day						
Forklifts, Rough Terrain	0.5688	3.5154	0.3207	0.30	341.2862	lb/day						
Generator	0.2442	3.252	0.0932	0.09	420.9196	lb/day						
Grader	0.4364	3.347	0.1931	0.18	346.9745	lb/day						
Loaders, Rubber Tired	0.3802	2.9334	0.169	0.16	307.1576	lb/day						
Off-Highway Trucks	0.2694	2.3193	0.084	0.08	324.2219	lb/day						
Other Construction Equ	0.4831	3.2926	0.277	0.25	352.6626	lb/day						
Pavers	0.7493	4.481	0.3964	0.36	352.6626	lb/day						
Paving Equipment	0.6371	3.8166	0.3379	0.31	301.4696	lb/day						
Pump	0.6552	4.3599	0.3524	0.32	420.9197	lb/day						
Rollers	0.5707	3.5769	0.3109	0.29	318.534	lb/day						
Scraper	0.4244	3.8426	0.1515	0.14	409.5438	lb/day						
Signal Boards	1.56	4.3699	0.3974	0.37	443.6722	lb/day						
Skid Steer Loaders	0.7338	2.9456	0.2217	0.20	312.8457	lb/day						
Surfacing Equipment	0.1886	2.0623	0.0719	0.07	255.9647	lb/day						
Tractors	0.1841	1.1936	0.0462	0.04	312.8458	lb/day						
Trenchers	0.8915	5.4295	0.467	0.43	426.6079	lb/day						
Water Trucks	0.10	1.27	0.05	0.05	163.47	lb/day						
Fugitive Dust			10			lb/acre/day						
Equipment Type	Emission Rates for Year 2013											
	ROG	NOX	PM10	PM2.5	CO2	Unit	ROG	NOX	PM10	PM2.5	CO2	Unit
Employee Light-Duty Tr	0.023	0.029	0.004	0.004	39.255	lb/day/employee						
Haul Trucks	1.19	15.82	0.62	0.57	1847.96	g/mile	10.181	7.568	0.014	0.01225	199.87	g/trip
Backhoes	0.1763	1.232	0.0392	0.04	312.8458	lb/day						
Bore/Drill Rigs	0.1773	1.6044	0.0494	0.05	426.6081	lb/day						
Compactor	0.2847	1.783	0.0698	0.06	244.5885	lb/day						
Concrete/Industrial Saw	0.5011	3.168	0.1228	0.11	415.2316	lb/day						

Revisions to DEIS/DEIR Section 3.11, "Air Quality"

Table 3.11-1 Summary of Annual Air Quality Data (2006—2008)			
	2006	2007	2008
Sacramento–3801 Airport Road			
Ozone			
<i>State standard (1-hour/8-hour average, 0.09/0.07 ppm)</i>			
<i>National standard (8-hour avg., 0.08 ppm)</i>			
Maximum concentration (1-hour/8-hour average, ppm)	0.105/0.086	0.119/0.102	0.109/0.093
Number of days state standard exceeded	5/13	2/8	8/15
Number of days national 8-hour standard exceeded	5	4	9
Respirable Particulate Matter (PM₁₀)			
<i>State standard (24-hour average, 50 µg/m³)</i>			
<i>National standard (24-hour average, 150 µg/m³)</i>			
Maximum concentration (µg/m ³)	84.0	98.0	71.0
Number of days state standard exceeded	4	6	3
Number of days national standard exceeded	0	0	N/A
Nitrogen Dioxide (NO₂)			
<i>State standard (1-hour average, 0.18 ppm)</i>			
<i>National standard (annual, 0.053 ppm)</i>			
Maximum concentration (µg/m ³) (1-hour average, ppm)	0.072	0.064	0.069
Number of days state standard exceeded	0	0	0
Carbon Monoxide (CO)			
<i>State standard (1-hour/8-hour average, 20/9.1 ppm)</i>			
<i>National standard (1-hour/8-hour average, 35/9.5 ppm)</i>			
Maximum concentration (1-hour/8-hour average, ppm)	4.70/3.15	6.30/5.58	N/A /1.83
Number of days state standard exceeded	0	0	0
Number of days national 1-hour/8-hour standard exceeded	0/0	0/0	N/A /0
Yuba City–Almond Street Monitoring Station			
Fine Particulate Matter (PM_{2.5})			
<i>No separate state standard</i> <i>State standard (annual, 12 µg/m³)</i>			
<i>National standard (24-hour average/annual, 35 µg/m³/15 µg/m³)</i>			
Maximum concentration (µg/m ³)	51.6	55.8	147.1
Number of days national standard exceeded	3	6	8
Notes: µg/m ³ = micrograms per cubic meter; NA = not available; ppm = parts per million by volume Sources: ARB 2009a, EPA 2009			

Table 3.11-2 Ambient Air Quality Standards and Attainment Status Designations for Sutter and Sacramento Counties						
Pollutant	Averaging Time	California		National Standards ¹		
		Standards ^{2,3}	Attainment Status ⁴	Primary ^{3,5}	Secondary ^{3,6}	Attainment Status ⁷
Ozone	1-hour	0.09 ppm (180 µg/m ³)	N (Serious)	–	–	–
	8-hour	0.07 ppm ⁸ (137 µg/m ³)	Sutter: N Sacramento: N (Serious)	0.075 ppm (157 µg/m ³)	Same as Primary Standard	Sutter: N (Severe -15) Sacramento: N (Serious Severe -15)
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	A	35 ppm (40 mg/m ³)	–	U/A
	8-hour	9 ppm (10 mg/m ³)		9 ppm (10 mg/m ³)		
Nitrogen Dioxide (NO ₂) ⁹	Annual Arithmetic Mean	0.030 ppm (56 µg/m ³)	A	0.053 ppm (100 µg/m ³)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (338 µg/m ³)		– <u>0.100 ppm</u>		
Sulfur Dioxide (SO ₂)	Annual Arithmetic Mean	–	–	0.030 ppm (80 µg/m ³)	–	U
	24-hour	0.04 ppm (105 µg/m ³)	A	0.14 ppm (365 µg/m ³)	–	
	3-hour	–	–	–	0.5 ppm (1300 µg/m ³)	
	1-hour	0.25 ppm (655 µg/m ³)	A	–	–	
Respirable Particulate Matter (PM ₁₀)	Annual Arithmetic Mean	20 µg/m ³	N	– ¹⁰	Same as Primary Standard	Sutter: U Sacramento: N (Moderate)
	24-hour	50 µg/m ³		150 µg/m ³		
Fine Particulate Matter (PM _{2.5})	Annual Arithmetic Mean	12 µg/m ³	Sutter: U Sacramento: N	15 µg/m ³	Same as Primary Standard	Sutter: N (Proposed) Sacramento: U/A
	24-hour	–	–	35 µg/m ³		
Lead	30-day Average	1.5 µg/m ³	A	–	–	A
	Calendar Quarter	–	–	1.5 µg/m ³	Same as Primary Standard	

**Table 3.11-2
Ambient Air Quality Standards and Attainment Status Designations for Sutter and Sacramento Counties**

Pollutant	Averaging Time	California		National Standards ¹		
		Standards ^{2,3}	Attainment Status ⁴	Primary ^{3,5}	Secondary ^{3,6}	Attainment Status ⁷
Sulfates	24-hour	25 µg/m ³	A	No National Standards		
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)	U			
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer—visibility of 10 miles or more (0.07—30 miles or more for Lake Tahoe) because of particles when the relative humidity is less than 70%.	U			

¹ National standards (other than ozone, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM₁₀ 24-hour standard is attained when 99% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The PM_{2.5} 24-hour standard is attained when 98% of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the EPA for further clarification and current Federal policies.

² California standards for ozone, CO (except Lake Tahoe), SO₂ (1- and 24-hour), NO₂, PM, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equal to or exceeded. California Ambient Air Quality Standards (CAAQS) are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

³ Concentration expressed first in units in which it was promulgated (i.e., parts per million [ppm] or micrograms per cubic meter [µg/m³]). Equivalent units given in parentheses are based upon a reference temperature of 25°C and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

⁴ Unclassified (U): a pollutant is designated unclassified if the data are incomplete and do not support a designation of attainment or nonattainment.
 Attainment (A): a pollutant is designated attainment if the state standard for that pollutant was not violated at any site in the area during a 3-year period.
 Nonattainment (N): a pollutant is designated nonattainment if there was a least one violation of a state standard for that pollutant in the area.
 Nonattainment/Transitional (NT): is a subcategory of the nonattainment designation. An area is designated nonattainment/transitional to signify that the area is close to attaining the standard for that pollutant.

⁵ National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

⁶ National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

⁷ Nonattainment (N): any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
 Attainment (A): any area that meets the national primary or secondary ambient air quality standard for the pollutant.
 Unclassifiable (U): any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

⁸ This concentration effective May 17, 2006.

⁹ The CAAQS were amended on February 22, 2007, to lower the 1-hour standard to 0.18 ppm and establish a new annual standard of 0.03 ppm. These changes become effective after regulatory changes are submitted and approved by the Office of Administrative Law, expected later this year.

¹⁰ Because of a lack of evidence linking health problems to long-term exposure to coarse particle pollution, EPA revoked the annual PM₁₀ standard on September 21, 2006.

Source: ARB 2009b

Revisions to DEIS/DEIR Section 4.11, "Air Quality"

**Table 4.11-1
Construction Schedule for the Adjacent Levee Alternative's (Proposed Action's)
Major Project Components**

Major Project Component	Construction Season (May–November)				
	2012 (%)	2013 (%)	2014 (%)	2015 (%)	2016 (%)
Phase 3 Project – Overlapping Components					
NEMDC South – Cutoff Wall	=	=	=	100	=
Phase 4a Project – Overlapping Components					
Sacramento River east levee Reach A:13–15	100	-	-	-	-
Riverside Canal	100	-	-	-	-
Phase 4b Project – All Components					
Sacramento River east levee Reach A:16–20	-	50	50	-	-
American River north levee Reach I:1–4	50	50	-	-	-
NEMDC North (Reaches F–G) levee raising	-	-	-	-	100
PGCC and NEMDC South (Reaches E and H) levee raising	-	-	-	100	-
PGCC and NEMDC South (Reaches E and H) waterside improvements	-	-	-	100	-
PGCC culvert remediation	-	-	100	-	-
SR 99 NCC Bridge remediation	100	-	-	-	-
West Drainage Canal	-	100	-	-	-
Riego Road Canal relocation	-	-	100	-	-
NCC south levee ditch relocations	100	-	-	-	-
RD 1000 Pumping Plant modifications	-	-	-	100	-
City of Sacramento Pumping Plant modifications	-	100	-	-	-
South Fisherman's Lake Borrow Area and West Lakeside School Site excavation and reclamation	-	-	100	-	-
Triangle Properties Borrow Site excavation and reclamation	-	-	100	-	-
Notes: NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; PGCC = Pleasant Grove Creek Canal; RD = Reclamation District; SR = State Route Source: Data compiled by AECOM in 2010					

**Table 4.11-2a
Summary of Maximum Daily Emissions within Sutter County During 2012–2016
for the Adjacent Levee Alternative (Proposed Action)**

Year	2012						2013				2014				2015				2016										
	Pollutant	ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}					
				C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM						
SR 99 NCC Bridge remediation	6.7	37.5	3.0	211.4 <u>124.0</u>	2.8	22.4 <u>16.4</u>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
NCC south levee ditch relocations	6.6	53.9	2.4	338.3	2.2	39.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
PGCC culvert remediation	-	-	-	-	-	-	-	-	-	-	-	11.9	97.3	17.6	59.7	5.9	6.4	-	-	-	-	-	-	-	-				
Riego Road Canal relocation	-	-	-	-	-	-	-	-	-	-	-	1.7	13.1	0.6	108.5	0.5	13.7	-	-	-	-	-	-	-	-				
Triangle Properties Borrow Site excavation and reclamation	-	-	-	-	-	-	-	-	-	-	-	3.9	32.0	1.6	132.7 <u>26.7</u>	1.5	15.7 <u>0.8</u>	-	-	-	-	-	-	-	-				
PGCC (Reaches E and H) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3.6	27.0	1.4	36.3	1.3	4.2	-	-				
PGCC (Reaches E and H) waterside improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.2	8.2	0.5	11.3	0.4	1.2	-	-				
NEMDC North (Reaches F–G) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22.4	129.2	6.4	1139.7 <u>715.7</u>			
Total unmitigated emissions (lb/day)	13.3	91.491.5	5.5	549.7 <u>461.9</u>	5.85.1	61.9 <u>55.9</u>	-	-	-	-	-	17.5	142.4	19.8	300.9 <u>195.0</u>	7.9	35.7 <u>20.9</u>	4.7	35.2	1.9	47.6	1.7	5.4	22.4	129.2	6.4	1139.7 <u>715.7</u>	33.3	99.6 <u>72.6</u>
			551.2467.4		67.761.0									320.7214.7		43.6				49.5		7.1				1146.1722.1		132.8105.9	
FRAQMD Threshold (lb/day)	25	25	80	- ¹	25	25	80	- ¹	25	25	80	- ¹	25	25	80	- ¹	25	25	80	- ¹	25	25	80	- ¹					
Significant?	No	Yes	Yes	-	No	No	No	No	No	Yes	Yes	-	No	Yes	Yes	-	No	Yes	Yes	-	No	Yes	Yes	-					
Total mitigated emissions (lb/day) ²	12.6	73.2 <u>54.9</u>	30.5 <u>72.3</u>	5.9 <u>11.2</u>	-	-	-	-	16.6	113.985.4	25.9 <u>40.1</u>	6.1 <u>7.5</u>	4.5	28.121.1	3.4 <u>8.2</u>	1.2 <u>1.7</u>	21.3	103.377.5	60.5 <u>75.1</u>	23.3 <u>25.6</u>									
Significant with Mitigation Incorporated?	No	No ³	No	-	No	No ³	No	-	No	No ³	No	-	No	No ³	No	-	No	No ³	No	-									

Notes: Table entries in bold exceed thresholds.

C = combustion sources (construction equipment); EM = earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; µg/m³ = micrograms per cubic meter; NEMDC = Natomas East Main Drainage Canal; NCC = Natomas Cross Canal; NO_x = oxides of nitrogen; PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PGCC = Pleasant Grove Creek Canal; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

¹ FRAQMD does not have an adopted mass emission-based threshold for PM_{2.5}; implementation of the District-recommended Fugitive Dust Control Plan and additional control measures are presumed to assure compliance with the applicable SIP attainment goals.

² Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would reduce ROG, NO_x, and PM₁₀ emissions by approximately 5%, ~~20~~40%, ~~75~~85%, ~~95~~90% for fugitive PM₁₀ emissions from earthmoving activities, and 45% for mobile-source PM₁₀ emissions, respectively.

³ Coordination of an emissions reduction agreement with the FRAQMD for calculation and fee payment by the project proponent(s) to FRAQMD prior to project approval would be used to offset emissions in excess of FRAQMD's significance thresholds for daily NO_x emission resulting in a less-than-significant impact.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

**Table 4.11-2b
Summary of Maximum Daily Emissions within Sacramento County During 2012–2016
(Combined Portions of Phase 4a and 4b Projects) for the Adjacent Levee Alternative (Proposed Action)**

Year	2012						2013						2014						2015						2016						
	Pollutant	ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}	
				C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM		
Phase 4a Project – Overlapping Components																															
Sacramento River east levee Reach A:13–15 ¹	45.9 69.0	272.7 409.3	12.3 100.0	2,438.5 3,395.1	11.3 8.7	213.7 295.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Riverside Canal ²	21.7	101.0	4.7 280.2	1,428.1 1,233.9	4.3 24.4	132.5 98.7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Phase 4b Project – All Components																															
American River north levee Reach I:1–4	14.0	144.0	6.7	556.6 450.7	6.2	64.0 49.2	23.4	169.3	9.9	116.7 28.3	9.1	16.2 3.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
West Drainage Canal	-	-	-	-	-	-	4.3	37.9	1.6	439.7	1.5	55.9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
City of Sacramento Pumping Plant modifications	-	-	-	-	-	-	10.2	80.4	4.4	1.8	4.0	0.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sacramento River east levee Reach A:16–20	-	-	-	-	-	-	44.1	374.9	21.3	1017.4 964.4	19.6	113.2 105.8	44.2	374.9	21.3	1017.4 964.4	19.6	113.2 105.8	-	-	-	-	-	-	-	-	-	-	-		
South Fisherman’s Lake Borrow Area and West Lakeside School Site excavation and reclamation	-	-	-	-	-	-	-	-	-	-	-	-	3.6	29.5	1.5	127.3 21.3	1.3	15.7 0.8	-	-	-	-	-	-	-	-	-	-	-		
RD 1000 Pumping Plant modifications	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.2	80.4	4.4	1.8	4.0	0.2	-	-	-	-	-		
NEDMC South (Reaches E and H) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	64.4 63.4	482.8	25.1	648.0	23.1	74.4	-	-	-	-	-		
NEMDC South (Reaches E and H) waterside improvements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2.9	19.7	1.1	27.3	1.0	2.9	-	-	-	-	-		
NEMDC North (Reaches F–G) levee raising	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	23.7	136.6	6.8	1205.3 756.8	35.2	105.3 76.7	
Total unmitigated emissions (lb/day)	81.6 104.7	517.7 654.3	23.7 386.9	4,423.2 5,079.7	21.8 39.3	410.2 443.1	81.9	662.5	37.1	1,575.5 1,434.1	34.2	185.4 164.9	47.7	404.4	22.7	1,114.6 985.7	20.9	128.9 106.6	76.4	582.9	30.5	677.1	28.1	77.5	23.7	136.6	6.8	1205.3 756.8	35.2	105.3 76.7	
SMAQMD Threshold	-	85	-	-	-	-	-	85	-	-	-	-	-	85	-	-	-	-	85	-	-	-	-	-	-	85	-	-	-	-	
Significant?	-	Yes	- ⁴	-	-	-	-	Yes	- ⁴	-	-	-	-	Yes	- ⁴	-	-	-	-	-	- ⁴	-	-	-	-	Yes	- ⁴	-	-	-	
Total mitigated emissions (lb/day) ³	77.5 99.5	414.2 392.6	234.6 974.8	- 88.1	-	-	77.8	530 397.5	99.2 235.5	28.1 43.5	-	-	45.3	323.5 242.6	69.7 160.4	18 27.5	-	72.6	466.3 349.7	50.6 118.4	19.3 27.1	-	-	22.5	109.3 82.0	64.0 79.4	24.6 27.0	-	-		
Significant with Mitigation Incorporated?	-	No ⁵	No ⁴	-	-	-	-	No ⁵	No ⁴	-	-	-	-	No ⁵	No ⁴	-	-	-	No ⁵	No ⁴	-	-	-	-	No ⁵	No ⁴	-	-	-	-	

Notes: Table entries in bold exceed thresholds.
C = combustion sources; EM = earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; µg/m³ = micrograms per cubic meter; NEMDC = Natomas East Main Drainage Canal; NCC = Natomas Cross Canal; NO_x = oxides of nitrogen; PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; PGCC = Pleasant Grove Creek Canal; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District
¹ Earthmoving activities during Sacramento River east levee Reaches 13–15 include excavation of borrow sites and movement of levee fill material totaling approximately 1.3 million cubic yards.
² Earthmoving activities during Riverside Canal relocation include excavation of borrow site material totaling approximately 410,000 cubic yards.
³ Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would reduce ROG, NO_x, and PM10 emissions by approximately 5%, 2040%, 7585%–9590% for fugitive PM10 emissions from earthmoving activities, and 45% for mobile-source PM10 emissions, respectively.
⁴ SMAQMD does not have an adopted mass emission-based threshold for PM10. However, in absence of a localized threshold, emissions are compared against concentration based Ambient Air Quality Standards (AAQS); PM10 24-hr standard = 50 µg/m³; SMAQMD’s CEQA Guide allows for enhanced PM10 Dust Control Practices to be proposed and implemented at the proposed project site for quantifiable emissions reductions. The proposed Phase 4b Project has developed a comprehensive Fugitive Dust Control Plan in compliance with the guidelines that will effectively reduce mass PM10 emissions below the concentration based thresholds.
⁵ Payment into SMAQMD’s Off-site Construction Mitigation Fee Program to offset NO_x emissions in excess of SMAQMD’s significance threshold would reduce impacts for this pollutant in SMAQMD’s jurisdiction to a less-than-significant level.
See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction, etc.).
Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2009

**Table 4.11-3
Maximum Daily Emissions during the Peak (2013) Construction Season within Sacramento County
for the Fix-in-Place Alternative¹**

Year	2013						
	Pollutant	ROG	NO _x	PM ₁₀		PM _{2.5}	
				Combustion	Earthmoving	Combustion	Earthmoving
Total unmitigated emissions (lb/day)	81.9	662.5	37.1	1203.9 <u>1,062.5</u>	34.2	145.9 <u>125.3</u>	
SMAQMD Threshold²	-	85	-	-	-	-	
Significant?	-	Yes	-	-	-	-	
Total mitigated emissions (lb/day) ²	77.8	530.0 <u>398.0</u>	20.4	60.2 <u>159.3</u>	18.8	7.3 <u>18.8</u>	
			80.6 <u>180.0</u>		26.4 <u>37.6</u>		
Significant with Mitigation Incorporated?	-	No ⁴	-	-	-	-	

Notes: Table entries in bold exceed thresholds. EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; µg/m³ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NO_x = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

¹ Peak daily emissions during the Fix-in-Place Alternative occur entirely within Sacramento County; no activities would occur in Sutter County during the 2013 construction season.

² Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NO_x, and PM₁₀ emissions by approximately 5% for ROG, ~~20.4~~20.4% for NO_x, ~~75.85~~85.90% for fugitive PM₁₀ emissions, and 45% for mobile-source PM₁₀ emissions.

³ SMAQMD does not have an adopted mass emission-based threshold for PM₁₀ or PM_{2.5}; the project proponent(s) have proposed Fugitive Dust Control Plan(s) and Enhanced Control Measures that will effectively reduce and maintain PM₁₀ and PM_{2.5} emissions below the applied concentration based thresholds.

⁴ Payment into SMAQMD's Off-site Construction Mitigation Fee Program to offset NO_x emissions in excess of SMAQMD's significance threshold would reduce impacts for this pollutant in SMAQMD's jurisdiction to a less-than-significant level.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

**Table 4.11-4
Summary of Maximum Annual Emissions During the 2012–2016 Construction Seasons
(Combined Portions of Phase 4a and 4b Projects) for the Adjacent Levee Alternative (Proposed Action)**

Project Phase Components	Annual Emissions																													
	2012 (TPY)						2013 (TPY)						2014 (TPY)						2015 (TPY)						2016 (TPY)					
	ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}		ROG	NO _x	PM ₁₀		PM _{2.5}	
			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM			C	EM	C	EM						
Phase 4a Project – Overlapping Portions	4.0 5.5	22.6 31.2	4 1.3	293.9 414.9	0.9 1.2	31.4 44.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Phase 4b Project – All Components	1.3 1.2	8.4 8.5	0.5 0.4	48.3 40.3	0.5 0.4	5.5 4.5	4.1	29.8	1.6	105.2 91.4	1.5	11.9 10.1	3.5	25.9	1.5	102.8 74.6	1.3	11.8 7.9	3.7 5.0	25.1 33.6	1.2 1.8	28 40.9	1.2 1.3	3.3	3.9	22.3	1.1	187.5 114.1	3.7	17.6 12.5
Annual Unmitigated Emissions Total	5.2 6.7	31.1 39.6	1.4 1.8	342.2 455.2	1.3 1.6	37.0 49.0	4.1	29.8	1.6	105.2 91.4	1.5	12.0 10.1	3.5	25.9	1.5	102.8 74.6	1.3	11.9 7.9	3.7 5.0	25.2 33.6	1.2 1.8	28.1 40.9	1.1 1.3	3.2 3.3	3.9	22.3	1.1	187.5 114.1	3.7	17.6 12.5
	0.8	51.3	0.7	5.5	0.9	15.8																								
Annual Mitigated Emissions Total ¹	5.0 6.4	24.8 24.0	52.1 69.2	6.3 8.2	3.9	23.9 18.0	3.9	23.9 18.0	16.7 14.6	2.6 2.3	3.3	20.7 15.5	16.3 12.0	2.5 1.9	3.5 4.7	20.1	4.9 7.1	1.1 1.2	3.7	17.9 13.4	28.7 17.7	4.7 3.9	25	25	100	100	25	25	100	100
General Conformity Threshold	25	25	100	100	25	25	25	25	100	100	25	25	100	100	25	25	100	100	25	25	100	100	25	25	100	100	25	25	100	100
Exceed <i>de minimus</i> Threshold?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	

Notes: Table entries in bold exceed thresholds. C = Emissions from combustion (from construction equipment); EM = PM emissions from earthmoving activities; EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; µg/m³ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NO_x = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District
¹ Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NO_x, and PM₁₀ emissions by approximately 5% for ROG, 20-40% for NO_x, 75-85%–85-90% for fugitive PM₁₀ emissions, and 45% for mobile-source PM₁₀ emissions.
 See **Appendix F** for assumptions and modeling results for each project activity and subphase (i.e., site preparation, cutoff wall installation, levee construction).
 Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010

**Table 4.11-5
Maximum Annual Emissions during the Peak (2013) Construction Season
for the Fix-in-Place Alternative¹**

Pollutant	ROG	NO _x	PM ₁₀		PM _{2.5}	
			Combustion	Earthmoving	Combustion	Earthmoving
Total unmitigated emissions (tons/year)	4.2	31.8	1.7	79.2 65.4	1.5	9.2 7.3
SMAQMD Threshold²	25	25	100		100	
Significant?	-	Yes	No		No	
Total mitigated emissions (tons/year) ²	4.0	25 19.1	0.9	4.0 9.8	0.8	0.5 1.1
			80.6 10.7		26.1 1.9	
Significant with Mitigation Incorporated?	No	No	No		No	

Notes: Table entries in bold exceed thresholds.

EPA = Environmental Protection Agency; FRAQMD = Feather River Air Quality Management District; lb/day = pounds per day; µg/m³ = micrograms per cubic meter; NCC = Natomas Cross Canal; NEMDC = Natomas East Main Drainage Canal; NO_x = oxides of nitrogen; PGCC = Pleasant Grove Creek Canal; PM₁₀ = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; ROG = reactive organic gases; SMAQMD = Sacramento Metropolitan Air Quality Management District

¹ Peak daily emissions during the Fix-in-Place Alternative occur entirely within Sacramento County; no activities would occur in Sutter County during the 2013 construction season.

² Implementation of all recommended standard mitigation measures listed under Mitigation Measure 4.11-a would result in reductions of ROG, NO_x, and PM₁₀ emissions by approximately 5% for ROG, ~~20~~40% for NO_x, ~~75~~85%–~~85~~90% for fugitive PM₁₀ emissions, and 45% for mobile-source PM₁₀ emissions.

See **Appendix F** for assumptions and modeling results for each activity and subphase (i.e., site preparation, cutoff wall installation, levee construction.).

Source: Calculations performed by AECOM based on data provided by HDR, Wood Rodgers, and Mead & Hunt in 2010