APPENDIX F

Air Quality Modeling Results

PHASE 2 NLIP Emissions Summary

Unmitigated 2008 Emissions

Sutter County	Worst-Case lb/day			Tons/year			Sacramento County	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10		ROG	NOX	PM10	ROG	NOX	PM10
NCC	58	317	184	4	22	80	East Levee	12	62	389	1	3	21
East Levee	110	555	3499	5	28	189	Elkhorn Canal	27	118	180	1	6	4
TOTAL	168.9	871.7	3683.0	9.3	49.7	269.2	TOTAL	39.3	180.0	568.9	1.8	9.2	25.1

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		ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%	% Reduction	5%	20%	75%	5%	20%	75%
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
Threshold	25	25	80	25	25	-		-	85	-	25	25	100
Significant?	Y	Y	Y	N	Y	-		-	Y	Y*	N	N	N

Unmitigated 2010 Emissions

No Phase 2 NCC work would occur in 2010, 15% of all other Phase 2 work could occur in 2010 in Sutter County and 15% could occur in Sacramento County

Sutter County	Worst-Case lb/day			Tons/year			Sacramento County	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10		ROG	NOX	PM10	ROG	NOX	PM10
NCC	0	0	0	0	0	0	East Levee	2	9	58	0	0	3
East Levee	17	83	525	1	4	28	Elkhorn Canal	4	18	27	0	1	1
TOTAL	16.6	83.2	524.8	0.8	4.2	28.4	TOTAL	5.9	27.0	85.3	0.3	1.4	3.8

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		ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%	% Reduction	5%	20%	75%	5%	20%	75%
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

PHASE 2 NLIP Emissions Summary

Unmitigated 2008 Emissions

Sutter County	Worst-Case lb/day			Tons/year			Sacramento County	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10		ROG	NOX	PM10	ROG	NOX	PM10
NCC	58	317	184	4	22	80	East Levee	12	62	389	1	3	21
East Levee	110	555	3499	5	28	189	Elkhorn Canal	27	118	180	1	6	4
TOTAL	168.9	871.7	3683.0	9.3	49.7	269.2	TOTAL	39.3	180.0	568.9	1.8	9.2	25.1

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		ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%	% Reduction	5%	20%	75%	5%	20%	75%
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
Threshold	25	25	80	25	25	-		-	85	-	25	25	100
Significant?	Y	Y	Y	N	Y	-		-	Y	Y*	N	N	N

Unmitigated 2010 Emissions

No Phase 2 NCC work would occur in 2010, 15% of all other Phase 2 work could occur in 2010 in Sutter County and 15% could occur in Sacramento County

Sutter County	Worst-Case lb/day			Tons/year			Sacramento County	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10		ROG	NOX	PM10	ROG	NOX	PM10
NCC	0	0	0	0	0	0	East Levee	2	9	58	0	0	3
East Levee	17	83	525	1	4	28	Elkhorn Canal	4	18	27	0	1	1
TOTAL	16.6	83.2	524.8	0.8	4.2	28.4	TOTAL	5.9	27.0	85.3	0.3	1.4	3.8

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		ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%	% Reduction	5%	20%	75%	5%	20%	75%
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

SEL Phase 4a

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR SEL 10-15 TO OCCUR IN SACRAMENTO COUNTY

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[1]Site Preparation (concurrent with 2,3)						0	yd3						1.0	0.0	540.0	10.0	54.0	days	
Mobile Sources														*assumes haul load=14 yd3		*assumes haul trucks drive length of levee each day			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	10	trucks	1.3	17.2	0.7	2208.9	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	540	trips	14.0	9.7	0.0	266.1	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	2		10.8	137.2	5.4	17654.8	lb/yr							
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	6		150.5	1413.0	57.1	132692.2	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		46.2	359.7	20.8	33173.0	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	2		52.8	409.8	23.7	37473.2	lb/yr							
Chipper(s)	0.63	4.94	0.28	443.67	lb/day	4		135.9	1067.0	61.3	95833.2	lb/yr							
Crawler Tractor(s)	0.52	4.87	0.20	369.73	lb/day	2		56.3	526.2	22.0	39930.5	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	68	employees	84.5	106.5	14.7	144144.4	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	trucks	-	-	-	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	10	trucks	-	-	82,340.7	-	lb/yr							
Total								**552.2**	**4046.3**	**82546.3**	**503376.3**	**lb/yr**						2000	lb/ton
Total								**10.2**	**74.9**	**1528.6**	**9321.8**	**lb/day**							
[2]Removal of Landside Structures and Other Facilities (concurrent with 1,3)						0	yd3						1.0	0.0	1152.0	24.0	48.0	days	

NCC Phase 4a

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR NCC TO OCCUR IN SUTTER COUNTY

Phases 1-7: Cutoff Wall Construction, Phases 8-11: Levee Raise Construction

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[1]Site Preparation						0	yd3						1.0	0.0	2.0	1.0	2.0	days	
Mobile Sources														*assumes haul load=14 yd3		*assumes haul trucks drive length of levee each day			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	1	trucks	0.0	0.1	0.0	8.2	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	2	trips	0.1	0.0	0.0	1.0	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		0.2	2.5	0.1	326.9	lb/yr							
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	1		0.9	8.7	0.4	819.1	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	1		0.9	6.7	0.4	614.3	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	0.7	0.9	0.1	1177.7	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	1	trucks	-	-	1.8	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	1	trucks	-	-	1.1	-	lb/yr							
Total								**2.7**	**18.9**	**3.9**	**2947.2**	**lb/yr**						2000	lb/ton
Total								**1.4**	**9.4**	**1.9**	**1473.6**	**lb/day**							
[2]Levee Degrading						0	yd3						1.0	0.0	0.0	0.0	3.0	days	
Mobile Sources														*assumes haul load=14 yd3		*assumes haul trucks drive length of levee each day			
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	1		1.4	13.1	0.5	1228.6	lb/yr							
Bulldozers	0.46	4.06	0.17	335.60	lb/day	1		1.4	12.2	0.5	1006.8	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	1		1.3	10.0	0.6	921.5	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	1.0	1.3	0.2	1766.5	lb/yr							
Total								**5.1**	**36.6**	**1.8**	**4923.4**	**lb/yr**						2000	lb/ton
Total								**1.7**	**12.2**	**0.6**	**1641.1**	**lb/day**							
[3]Pipeline Removal						0	yd3						4.0	0.0	12.0	4.0	3.0	days	
Mobile Sources																			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	1	trucks	0.0	0.4	0.0	49.1	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	2	trips	0.1	0.0	0.0	1.0	lb/yr						0.00220462	lb/gram
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	1		1.3	9.7	0.6	972.7	lb/yr		*assumes haul load=14 yd3					
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	1.0	1.3	0.2	1766.5	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	6	VMT/yr	-	-	5.4	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes, scraper hauling is on 100% unpaved routes						
Travel on paved roads	-	-	0.28	-	lb/VMT	6	VMT/yr	-	-	3.4	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Total								**2.4**	**11.4**	**9.5**	**2789.2**	**lb/yr**						2000	lb/ton
Total								**0.8**	**3.8**	**3.2**	**929.7**	**lb/day**							
						Brookfield Site	3750	yd3					4.0	267.9	1071.4	89.3	12.0	days	
[4] Cutoff Wall Construction						Commercial Source	150	yd3					30.0	10.7	321.4	26.8	12.0	days	
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	1	trucks	3.4	44.4	1.7	5697.5	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	279	trips	7.2	5.0	0.0	137.3	lb/yr						0.00220462	lb/gram
Loader(s)	0.43	3.33	0.19	307.16	lb/day	1		5.1	40.0	2.3	3685.9	lb/yr							
Pallet Loader(s) [Forklifts]	0.66	4.01	0.37	341.29	lb/day	1		8.0	48.1	4.4	4095.4	lb/yr							
Generator(s)	0.29	3.78	0.11	420.92	lb/day	2		6.9	90.8	2.7	10102.1	lb/yr							
Pump(s)	0.76	4.91	0.40	420.92	lb/day	2		18.3	117.9	9.5	10102.1	lb/yr							
Pickup(s)	0.02	0.03	0.00	39.26	lb/day	3		0.8	1.0	0.1	1413.2	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	1		5.1	38.7	2.3	3890.7	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	4.1	5.2	0.7	7065.9	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	536	VMT/yr	-	-	480.9	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	536	VMT/yr	-	-	151.3	-	lb/yr							
Total								**59.0**	**391.1**	**656.1**	**46190.0**	**lb/yr**						2000	lb/ton
Total								**4.9**	**32.6**	**54.7**	**3849.2**	**lb/day**							
[5]Levee Crown Reconstruction						0	yd3						4.0	0.0	0.0	0.0	6.0	days	
Mobile Sources																			
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		0.6	7.6	0.3	980.8	lb/yr							
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	1		2.8	26.2	1.1	2457.3	lb/yr							
Roller(s)	0.65	3.99	0.35	318.53	lb/day	2		7.8	47.8	4.2	3822.4	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	2.1	2.6	0.4	3533.0	lb/yr							
Total								**13.3**	**84.2**	**5.9**	**10793.4**	**lb/yr**						2000	lb/ton
Total								**2.2**	**14.0**	**1.0**	**1798.9**	**lb/day**							
[6]Borrow Site Excavation						0	yd3						4.0	0.0	72.0	12.0	6.0	days	
Mobile Sources																			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	3	trucks	0.2	2.3	0.1	294.5	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	18	trips	0.5	0.3	0.0	8.9	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		0.6	7.6	0.3	980.8	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	1		2.5	19.3	1.2	1945.3	lb/yr		*assumes haul load=14 yd3					
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	2.1	2.6	0.4	3533.0	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	1.10	-	lb/VMT	36	VMT/yr	-	-	39.7	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes, scraper hauling is on 100% unpaved routes						
Travel on paved roads	-	-	0.52	-	lb/VMT	36	VMT/yr	-	-	37.5	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Total								**5.9**	**32.2**	**79.1**	**6762.5**	**lb/yr**						2000	lb/ton
Total								**1.0**	**5.4**	**13.2**	**1127.1**	**lb/day**							

NCC Phase 4a

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR NCC TO OCCUR IN SUTTER COUNTY

Phases 1-7: Cutoff Wall Construction, Phases 8-11: Levee Raise Construction

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[7]Site Restoration/Demobilization						0	yd3						4.0	1.0	8.0	4.0	2.0	days	
														*assumes haul load=14 yd3	*assumes trucks drive 5 miles/day				
Mobile Sources																			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	1	trucks	0.0	0.3	0.0	32.7	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	2	trips	0.1	0.0	0.0	1.0	lb/yr						0.00220462	lb/gram
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	2		1.2	11.0	0.4	1296.9	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		0.2	2.5	0.1	326.9	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	15	employees	0.7	0.9	0.1	1177.7	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	1.10	-	lb/VMT	8	VMT/yr	-	-	8.8	-	lb/yr							
Travel on paved roads	-	-	0.52	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr							
Total								**3.3**	**25.8**	**9.5**	**2835.2**	**lb/yr**						2000	lb/ton
Total								**1.7**	**12.9**	**4.7**	**1417.6**	**lb/day**							
[8]Levee Raising (Levee Raise Component)						0	yd3						1.0	0.0	0.0	0.0	10.0	days	
																	85.0	days	
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		1.0	12.7	0.5	1634.7	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	1		4.3	33.3	1.9	3071.6	lb/yr							
Roller(s)	0.65	3.99	0.35	318.53	lb/day	4		220.8	1355.7	117.9	108301.5	lb/yr							
Bulldozer(s)	0.46	4.06	0.17	335.60	lb/day	1		38.9	345.0	14.7	28525.8	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	20	employees	39.1	49.3	6.8	66733.5	lb/yr						0.00220462	lb/gram
Total								**304.1**	**1796.0**	**141.9**	**208267.1**	**lb/yr**						2000	lb/ton
Total								**3.6**	**21.1**	**1.7**	**2450.2**	**lb/day**							
[9]Borrow Site Excavation (Levee Raise Component)					Brookfield Site	33000	yd3						4.0	2357.1	9428.6	785.7	12.0	days	
														*assumes haul load=14 yd3					
Mobile Sources																			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	10	trucks	22.9	300.7	11.7	38567.6	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	2357	trips	61.2	42.5	0.1	1161.7	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		1.2	15.2	0.6	1961.6	lb/yr							
Bulldozer(s)	0.46	4.06	0.17	335.60	lb/day	1		5.5	48.7	2.1	4027.2	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	1		5.1	38.7	2.3	3890.7	lb/yr		*assumes haul load=14 yd3					
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	20	employees	5.5	7.0	1.0	9421.2	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	4714	VMT/yr	-	-	4,232.1	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Travel on paved roads	-	-	0.28	-	lb/VMT	4714	VMT/yr	-	-	1,331.2	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Material Handling													Tons/yd3 (gravel/sand)	Tons/day					
Material loading at borrow	-	-	0.04	-	lb/ton					1,674.3	-	lb/yr	1.25	3437.50					
Material unloading at levee	-	-	0.005	-	lb/ton					216.6	-	lb/yr	1.25	3437.50					
Bulldozing	-	-	0.41		lb/hr	8	hrs/day	-	-	39.43	-	lb/yr							
Total								**101.5**	**452.8**	**7511.3**	**59030.0**	**lb/yr**						2000	lb/ton
Total								**8.5**	**37.7**	**625.9**	**4919.2**	**lb/day**							
[10] Finish Grading (Levee Raise Component)						0	yd3						0.0	0.0	0.0	0.0	2.0	days	
														*assumes haul load=14 yd3	*assumes haul trucks drive 10 miles each day				
Mobile Sources																			
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	1		0.6	5.5	0.2	648.4	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	1		1.0	7.6	0.4	693.9	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		0.2	2.5	0.1	326.9	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	20	employees	0.9	1.2	0.2	1570.2	lb/yr							
Total								**2.7**	**16.8**	**0.9**	**3239.5**	**lb/yr**						2000	lb/ton
Total								**1.3**	**8.4**	**0.5**	**1619.8**	**lb/day**							
[11]Operating Road Construction (Levee Raise Component)						0	yd3						4.0	10.0	40.0	20.0	2.0	days	
														*assumes haul load=14 yd3	*assumes haul trucks drive 10 miles each day				
Mobile Sources																			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	5	trucks	0.1	1.3	0.0	163.6	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	0.00	10	trips	0.3	0.2	0.0	4.9	lb/yr						0.00220462	lb/gram
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	2		1.1	7.2	0.3	978.4	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	1		1.0	7.6	0.4	693.9	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	20	employees	0.9	1.2	0.2	1570.2	lb/yr						0.00220462	lb/gram
Fugitive Sources																			
Travel on unpaved roads	-	-	1.10	-	lb/VMT	20	VMT/yr	-	-	22.1	-	lb/yr							
Travel on paved roads	-	-	0.52	-	lb/VMT	20	VMT/yr	-	-	10.4	-	lb/yr							
Total								**3.4**	**17.4**	**33.5**	**3411.1**	**lb/yr**						2000	lb/ton
Total								**1.7**	**8.7**	**16.7**	**1705.5**	**lb/day**							
2010 calendar year																			
Total from NCC								**0.3**	**1.4**	**4.2**	**175.6**	**TPY**	to occur during 2010 calendar year						
Total from NCC								**12.0**	**58.9**	**627.6**	**-**	**Worst-case lb/day**	*assumes some phases will be conducted concurrently						

*These calculations represent worst-case emissions from construction activities associated with South Natomas Cross Canal work

Riverside Canal Phase 4a *2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR RIVERSIDE CANAL TO OCCUR IN SACRAMENTO COUNTY

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[1]Clearing, Grubbing, Stripping						90000	yd3						1.0	6428.6	6428.6	214.3	30.0	days	
Mobile Sources														*assumes haul load=14 yd3					
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	25	trucks	15.6	205.0	8.0	26296.1	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	6429	trips	167.0	115.9	0.2	3168.3	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	2		6.0	76.2	3.0	9808.2	lb/yr							
Bulldozers	0.46	4.06	0.17	335.60	lb/day	4		54.9	487.0	20.8	40271.7	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	4		51.3	399.7	23.1	36858.9	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	40	employees	27.6	34.8	4.8	47106.0	lb/yr							
Total								**139.8**	**997.7**	**51.7**	**134044.9**	**lb/yr**						2000	lb/ton
Total								**4.7**	**33.3**	**1.7**	**4468.2**	**lb/day**							
[2]Water Control Facility Construction						0	yd3						0.0	0.0	0.0	0.0	17.0	days	
Mobile Sources														*assumes haul load=14 yd3					
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	2		9.7	61.1	2.9	8316.0	lb/yr							
Backhoe(s)	0.21	1.38	0.07	312.85	lb/day	2		7.0	46.8	2.2	10636.8	lb/yr							
Generator(s)	0.29	3.78	0.11	420.92	lb/day	2		9.8	128.6	3.9	14311.3	lb/yr							
Pump(s)	0.76	4.91	0.40	420.92	lb/day	1		13.0	83.5	6.7	7155.6	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	4		20.2	187.8	7.1	22047.1	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	40	employees	15.6	19.7	2.7	26693.4	lb/yr							
Total								**75.3**	**527.5**	**25.5**	**89160.2**	**lb/yr**						2000	lb/ton
Total								**4.4**	**31.0**	**1.5**	**5244.7**	**lb/day**							
[3]Embankment and Access Road Construction						Fishermans Lake 410000	yd3	Transported by haul truck					4.0	29285.7	117142.9	1802.2	65.0	days	
Mobile Sources																			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	30	trucks	284.9	3736.2	145.4	479173.0	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	29286	trips	760.6	528.1	1.0	14433.3	lb/yr						0.00220462	lb/gram
Roller(s)	0.65	3.99	0.35	318.53	lb/day	4		168.9	1036.7	90.2	82818.8	lb/yr							
Bulldozers	0.46	4.06	0.17	335.60	lb/day	2		59.5	527.6	22.5	43627.7	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	2		63.6	493.3	28.6	45106.7	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	2		13.0	165.1	6.5	21251.1	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	40	employees	59.8	75.4	10.4	102063.0	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	58571	VMT/yr	-	-	52580.3	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes, scraper hauling is on 100% unpaved routes						
Travel on paved roads	-	-	0.28	-	lb/VMT	58571	VMT/yr	-	-	33078.3	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Material Handling													Tons/yd3 (gravel/sand)	Tons/day					
Material loading at borrow	-	-	0.04	-	lb/ton			-	-	20802.3	-	lb/yr	1.25	7884.62					
Material unloading at levee	-	-	0.005	-	lb/ton			-	-	0.0	-	lb/yr	1.25	7884.62					
Bulldozing	-	-	0.41	-	lb/hr	8	hrs/day	-	-	213.6	-	lb/yr							
Total								**1410.2**	**6562.4**	**106979.1**	**788473.6**	**lb/yr**						2000	lb/ton
Total								**21.7**	**101.0**	**1645.8**	**12130.4**	**lb/day**							
						Fisherman's Lake 0	yd3						4.0	0.0	0.0	0.0	3.0	days	
[4]Canal Lining						Commercial Source 100	yd3						30.0	7.1	214.3	71.4	3.0	days	
Mobile Sources														*assumes haul load=14 yd3					
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	2	trucks	0.5	6.8	0.3	876.5	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	7	trips	0.2	0.1	0.0	3.5	lb/yr						0.00220462	lb/gram
Pump(s)	0.76	4.91	0.40	420.92	lb/day	2		4.6	29.5	2.4	2525.5	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	4		3.6	33.1	1.2	3890.7	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	40	employees	2.8	3.5	0.5	4710.6	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	107	VMT/yr	-	-	96.2	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Travel on paved roads	-	-	0.28	-	lb/VMT	107	VMT/yr	-	-	30.3	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Total								**11.6**	**73.1**	**130.8**	**12006.8**	**lb/yr**						2000	lb/ton
Total								**3.9**	**24.4**	**43.6**	**4002.3**	**lb/day**							

Riverside Canal Phase 4a *2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR RIVERSIDE CANAL TO OCCUR IN SACRAMENTO COUNTY

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[5,6,7] Irrigation Interconnections, Erosion Control, Irrigation Canal Abandonment					Fisherman's Lake	0	yd3						1.0	0.0	0.0	0.0	20.0	days	
Grader(s)	0.49	3.79	0.22	346.97	lb/day	5		48.9	379.4	22.0	34697.4	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	8		16.0	203.2	8.0	26155.2	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	10		84.9	644.9	38.4	64844.4	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	3		17.8	165.7	6.2	19453.3	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		17.1	133.2	7.7	12286.3	lb/yr							
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	2		11.4	71.9	3.4	9783.5	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	40	employees	18.4	23.2	3.2	31404.0	lb/yr							
Total								**214.5**	**1621.6**	**88.9**	**198624.2**	**lb/yr**						2000	lb/ton
Total								**10.7**	**81.1**	**4.4**	**9931.2**	**lb/day**							
[8]Site Restoration/Demobilization					Commercial Source	10800	yd3						30.0	771.4	23142.9	680.7	34.0	days	
Mobile Sources													*assumes haul load=14 yd3		*assumes trucks drive 5 miles/day				
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	5	trucks	56.3	738.1	28.7	94665.9	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	771	trips	20.0	13.9	0.0	380.2	lb/yr						0.00220462	lb/gram
Loader(s)	0.43	3.33	0.19	307.16	lb/day	1		14.5	113.2	6.5	10443.4	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		3.4	43.2	1.7	5558.0	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	40	employees	31.3	39.4	5.4	53386.8	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	11571	VMT/yr	-	-	10,387.8	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	11571	VMT/yr	-	-	3,267.5	-	lb/yr							
Total								**140.1**	**1061.2**	**13704.3**	**164434.2**	**lb/yr**						2000	lb/ton
Total								**4.1**	**31.2**	**403.1**	**4836.3**	**lb/day**							
2010 calendar year																			
Total from Riverside Canal								**1.0**	**5.4**	**60.5**	**693.4**	**TPY**	to occur during 2010 calendar year						
Total from Riverside Canal								**21.7**	**101.0**	**1645.8**	**-**	**Worst-case lb/day**							

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

Pump Plant Work *2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR PUMPING PLANTS TO OCCUR IN SACRAMENTO COUNTY

Riverside, Plant 3, and Plant 5

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[1] Riverside Pipeline Relocation, Pumping House Relocation, Channel Realignment					Fisherman's Lake	0	yd3						1.0	0.0	0.0	0.0	40.0	days	
Grader(s)	0.49	3.79	0.22	346.97	lb/day	5		97.9	758.9	43.9	69394.9	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	8		32.0	406.4	16.0	52310.4	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	10		169.7	1289.9	76.8	129688.8	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	3		35.6	331.4	12.4	38906.7	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		34.2	266.5	15.4	24572.6	lb/yr							
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	2		22.9	143.9	6.8	19567.1	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/employ	15	employees	13.8	17.4	2.4	23553.0	lb/yr							
Total								**406.1**	**3214.3**	**173.8**	**357993.4**	**lb/yr**						2000	lb/ton
Total								**10.2**	**80.4**	**4.3**	**8949.8**	**lb/day**							
[2] #3 Pipeline Relocation, Pumping House Relocation, Channel Realignment					Fisherman's Lake	0	yd3						1.0	0.0	0.0	0.0	40.0	days	
Grader(s)	0.49	3.79	0.22	346.97	lb/day	5		97.9	758.9	43.9	69394.9	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	8		32.0	406.4	16.0	52310.4	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	10		169.7	1289.9	76.8	129688.8	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	3		35.6	331.4	12.4	38906.7	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		34.2	266.5	15.4	24572.6	lb/yr							
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	2		22.9	143.9	6.8	19567.1	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/employ	15	employees	13.8	17.4	2.4	23553.0	lb/yr							
Total								**406.1**	**3214.3**	**173.8**	**357993.4**	**lb/yr**						2000	lb/ton
Total								**10.2**	**80.4**	**4.3**	**8949.8**	**lb/day**							
[3] #5 Pipeline Relocation, Pumping House Relocation, Channel Realignment					Fisherman's Lake	0	yd3						1.0	0.0	0.0	0.0	40.0	days	
Grader(s)	0.49	3.79	0.22	346.97	lb/day	5		97.9	758.9	43.9	69394.9	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	8		32.0	406.4	16.0	52310.4	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	10		169.7	1289.9	76.8	129688.8	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	3		35.6	331.4	12.4	38906.7	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		34.2	266.5	15.4	24572.6	lb/yr							
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	2		22.9	143.9	6.8	19567.1	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/employ	15	employees	13.8	17.4	2.4	23553.0	lb/yr							
Total								**406.1**	**3214.3**	**173.8**	**357993.4**	**lb/yr**						2000	lb/ton
Total								**10.2**	**80.4**	**4.3**	**8949.8**	**lb/day**							
2010 calendar year																			
Total from Pumping Plants								**0.6**	**4.8**	**0.3**	**537.0**	**TPY**	to occur during 2010 calendar year						
Total from Pumping Plants								**20.3**	**160.7**	**8.7**	**-**	**Worst-case lb/day**							

Borrowsite Excavation

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR BORROW SITES TO OCCUR IN SACRAMENTO COUNTY

Fishermans Lake, I-5 Area, Habitat Conservation and Restoration

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/ Day	Time frame	Conversion Factor	
					Fisherman's Lake	500	acres	Includes borrow from Reaches 10-15					0.0	0.0	0.0	0.0	140.0	days	
[1] Borrow Site Excavation					I-5 Area	452	acres						**all hauling accounted for under other components of Phase 4a.						
Mobile Sources																			
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	2		28.0	355.6	14.0	45771.6	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		119.7	932.6	53.9	86004.1	lb/yr							
Bulldozer(s)	0.46	4.06	0.17	335.60	lb/day	2		128.2	1136.4	48.5	93967.4	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	2		118.8	902.9	53.8	90782.1	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/employ	20	employees	64.4	81.2	11.2	109914.0	lb/yr							
Fugitive Sources																			
Disturbed Acreage	-	-	10.00	-	lb/acre	68	lb/day	-	-	9,520.0	-	lb/yr							
Material Handling																			
Bulldozing	-	-	0.41		lb/hr	8	hrs/day	-	-	459.99	-	lb/yr							
Total								**459.1**	**3408.8**	**10161.3**	**426439.3**	**lb/yr**						2000	lb/ton
Total								**3.3**	**24.3**	**72.6**	**3046.0**	**lb/day**							
					Fisherman's Lake	0	yd3						0.0	0.0	0.0	0.0	30.0	days	
[2] Habitat Conservation, Borrow Site Restoration																			
Bulldozer(s)	0.46	4.06	0.17	335.60	lb/day	1		13.7	121.8	5.2	10067.9	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	1		3.0	38.1	1.5	4904.1	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	1		12.7	96.7	5.8	9726.7	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	1		8.9	82.8	3.1	9726.7	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/employ	10	employees	6.9	8.7	1.2	11776.5	lb/yr							
Total								**45.3**	**348.1**	**16.8**	**46201.9**	**lb/yr**						2000	lb/ton
Total								**1.5**	**11.6**	**0.6**	**1540.1**	**lb/day**							
2010 calendar year																			
Total from Borrow Site Work								**0.3**	**1.9**	**5.1**	**236.3**	**TPY**	to occur during 2010 calendar year						
Total from Borrow Site Work								**3.3**	**24.3**	**72.6**	**-**	**Worst-case lb/day**							

Phase 4a Summary

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

Fishermans Lake, I-5 Area, Habitat Conservation and Restoration

	ROG	NOX	PM10	CO2	Unit		
Total from SEL	9.8	56.9	811.6	6436.4	TPY	to occur during 2010 calendar year	
Total from SEL	153.3	909.6	8442.2	-	Worst-case lb/day	*assumes some phases will be conducted concurrently	
Total from NCC	0.3	1.4	4.2	175.6	TPY	to occur during 2010 calendar year	
Total from NCC	12.0	58.9	627.6	-	Worst-case lb/day	*assumes some phases will be conducted concurrently	
Total from Riverside Canal	1.0	5.4	60.5	693.4	TPY	to occur during 2010 calendar year	
Total from Riverside Canal	21.7	101.0	1645.8	-	Worst-case lb/day		
Total from Pumping Plants	0.6	4.8	0.3	537.0	TPY	to occur during 2010 calendar year	
Total from Pumping Plants	20.3	160.7	8.7	-	Worst-case lb/day		
Total from Borrow Site Work	0.3	1.9	5.1	236.3	TPY	to occur during 2010 calendar year	
Total from Borrow Site Work	3.3	24.3	72.6	-	Worst-case lb/day		
Total Phase 4a Sac Co	11.7	69.0	877.4	7903.0	TPY	to occur during 2010 calendar year	
Total Phase 4a Sac Co	198.6	1195.6	10169.3	-	Worst-case lb/day		
Total Phase 4a Sut Co	0.3	1.4	4.2	175.6	TPY	to occur during 2010 calendar year	
Total Phase 4a Sut Co	12.0	58.9	627.6	-	Worst-case lb/day		
Total Phase 4a	11.9	70.4	881.7	8078.6	TPY	to occur during 2010 calendar year	
Total Phase 4a	210.6	1254.5	10796.9	-	Worst-case lb/day		
Mitigation Reductions	5%	20%	75%	-			
Mitigated Phase 4a Sac Co	11.1	55.2	219.4	7903.0	TPY	to occur during 2010 calendar year	
Mitigated Phase 4a Sac Co	188.7	956.5	2542.3	-	Worst-case lb/day		
Mitigated Phase 4a Sut Co	0.2	1.2	1.1	175.6	TPY	to occur during 2010 calendar year	
Mitigated Phase 4a Sut Co	11.4	47.1	156.9	-	Worst-case lb/day		
Total Mitigated Phase 4a	11.3	56.3	220.4	8078.6	TPY	to occur during 2010 calendar year	
Total Mitigated Phase 4a	200.1	1003.6	2699.2	-	Worst-case lb/day		

SEL Phase 4a
Raise in Place Alternative

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR SEL 10-15 TO OCCUR IN SACRAMENTO COUNTY

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
[1]Site Preparation (concurrent with 2,3)						0	yd3						1.0	0.0	540.0	10.0	54.0	days	
Mobile Sources														*assumes haul load=14 yd3		*assumes haul trucks drive length of levee each day			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	10	trucks	1.3	17.2	0.7	2208.9	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	540	trips	14.0	9.7	0.0	266.1	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	2		10.8	137.2	5.4	17654.8	lb/yr							
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	6		150.5	1413.0	57.1	132692.2	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	2		46.2	359.7	20.8	33173.0	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	2		52.8	409.8	23.7	37473.2	lb/yr							
Chipper(s)	0.63	4.94	0.28	443.67	lb/day	4		135.9	1067.0	61.3	95833.2	lb/yr							
Crawler Tractor(s)	0.52	4.87	0.20	369.73	lb/day	2		56.3	526.2	22.0	39930.5	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	68	employees	84.5	106.5	14.7	144144.4	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	trucks	-	-	-	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	10	trucks	-	-	82,340.7	-	lb/yr							
Total								**552.2**	**4046.3**	**82546.3**	**503376.3**	**lb/yr**						2000	lb/ton
Total								**10.2**	**74.9**	**1528.6**	**9321.8**	**lb/day**							
[2]Removal of Landside Structures and Other Facilities (concurrent with 1,3)						0	yd3						1.0	0.0	1152.0	24.0	48.0	days	
Mobile Sources														*assumes haul load=14 yd3		*assumes haul trucks drive length of levee each day			
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	24	trucks	2.8	36.7	1.4	4712.3	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	1152	trips	29.9	20.8	0.0	567.8	lb/yr						0.00220462	lb/gram
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	2		40.7	309.6	18.4	31125.3	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	1		20.5	159.9	9.2	14743.6	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	68	employees	75.1	94.7	13.1	128128.3	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	trucks	-	-	-	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	24	trucks	-	-	374,741.8	-	lb/yr							
Total								**169.0**	**621.6**	**374784.0**	**179277.2**	**lb/yr**						2000	lb/ton
Total								**3.5**	**13.0**	**7808.0**	**3734.9**	**lb/day**							
[3]Excavate Stability Berm (concurrent with 1,2)						0	yd3	Transported by haul truck					1.0	0.0	168.0	12.0	14.0	days	
Mobile Sources					Reusable Fill	351000	yd3	Transported by scraper					0.1	25071.4	2507.1	179.1	14.0	days	
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	12	trucks	0.4	5.4	0.2	687.2	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	24	trips	0.6	0.4	0.0	11.8	lb/yr						0.00220462	lb/gram
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	10		59.4	451.5	26.9	45391.1	lb/yr		*assumes haul load=14 yd3					
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	5		32.5	305.3	12.3	28668.1	lb/yr							
Bulldozers	0.46	4.06	0.17	335.60	lb/day	4		25.6	227.3	9.7	18793.5	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	4		27.4	212.5	12.3	19430.6	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	2		2.8	35.6	1.4	4577.2	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	68	employees	21.9	27.6	3.8	37370.8	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	2591	VMT/yr	-	-	2326.1	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes, scraper hauling is on 100% unpaved routes						
Travel on paved roads	-	-	0.28	-	lb/VMT	84	VMT/yr	-	-	47.4	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Material Handling													Tons/yd3 (gravel/sand)	Tons/day					
Material loading at borrow	-	-	0.04	-	lb/ton			-	-	17808.8	-	lb/yr	1.25	31339.29					
Material unloading at levee	-	-	0.005	-	lb/ton			-	-	2303.4	-	lb/yr	1.25	31339.29					
Bulldozing	-	-	0.41	-	lb/hr	8	hrs/day	-	-	46.0	-	lb/yr							
Total								**170.7**	**1265.5**	**22598.4**	**154930.1**	**lb/yr**						2000	lb/ton
Total								**12.2**	**90.4**	**1614.2**	**11066.4**	**lb/day**							
[4]Construction of Adjacent Levee Raise & Seepage Berms (concurrent with 5,6,7)					Fisherman's Lake	3173000	yd3	Includes borrow from Reaches 10-15					4.0	226642.9	906571.4	6475.5	140.0	days	
					Commercial Source	103040	yd3	Includes borrow from Reaches 10-15, assumes 1.25 tons per yd3					30.0	7360.0	220800.0	1577.1	140.0	days	
Mobile Sources														*assumes haul load=14 yd3					
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	190	trucks	2741.4	35956.7	1399.3	4611514.6	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	234003	trips	6077.2	4220.0	8.3	115326.8	lb/yr						0.00220462	lb/gram
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	5		70.0	889.0	35.0	114429.0	lb/yr							
Scraper(s)	0.46	4.36	0.18	409.54	lb/day	10		650.3	6105.5	246.7	573361.3	lb/yr							
Loader(s)	0.43	3.33	0.19	307.16	lb/day	10		598.3	4663.2	269.4	430020.7	lb/yr							
Bulldozer(s)	0.46	4.06	0.17	335.60	lb/day	25		1602.6	14205.2	605.8	1174592.4	lb/yr							
Compactor(s)	0.29	1.80	0.09	244.59	lb/day	8		320.5	2014.1	95.8	273939.2	lb/yr							
Grader(s)	0.49	3.79	0.22	346.97	lb/day	8		548.0	4249.7	246.1	388611.3	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	10		594.1	4514.6	268.8	453910.7	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	75	employees	241.5	304.5	42.0	412177.5	lb/yr							
Fugitive Sources																			

SEL Phase 4a
Raise in Place Alternative

*2010 calendar year comprises reach 10-15 work to occur over 8 months (April - Nov)

ALL WORK FOR SEL 10-15 TO OCCUR IN SACRAMENTO COUNTY

	ROG	NOX	PM10	CO2	Unit	Quantity	Unit	ROG	NOX	PM10	CO2	Unit	Distance (miles/round-trip)	# of Haul Loads	Total Miles Traveled	Total Miles Traveled/Day	Time frame	Conversion Factor	
Travel on unpaved roads	-	-	0.90	-	lb/VMT	563686	VMT/yr	-	-	506,027.9	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Travel on paved roads	-	-	0.28	-	lb/VMT	674086	VMT/yr	-	-	190,345.3	-	lb/yr	*assumes that material hauling is along 50% paved and 50% unpaved haul routes						
Material Handling													Tons/yd3 (gravel/sand)	Tons/day					
Material loading at borrow	-	-	0.04	-	lb/ton			-	-	166,217.7	-	lb/yr	1.25	29250.36					
Material unloading at levee	-	-	0.005	-	lb/ton			-	-	21,499.0	-	lb/yr	1.25	29250.36					
Bulldozing	-	-	0.41		lb/hr	8	hrs/day	-	-	459.99	-	lb/yr							
Total								**13444.0**	**77122.6**	**887767.1**	**8547883.5**	**lb/yr**						2000	lb/ton
Total								**96.0**	**550.9**	**6341.2**	**61056.3**	**lb/day**							
						Fisherman's Lake	0	yd3	Includes borrow from Reaches 10-15				1.0	8.0	480.0	8.0	60.0	days	
[5] Cutoff Wall Construction (concurrent with 4,6,7)						Commercial Source	0	yd3	Includes borrow from Reaches 10-15				30.0	0.0	14400.0	240.0	60.0	days	
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	8	trucks	36.2	474.6	18.5	60866.7	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	480	trips	12.5	8.7	0.0	236.6	lb/yr						0.00220462	lb/gram
Loader(s)	0.43	3.33	0.19	307.16	lb/day	6		153.9	1199.1	69.3	110576.8	lb/yr							
Bulldozer(s)	0.46	4.06	0.17	335.60	lb/day	25		686.8	6088.0	259.6	503396.7	lb/yr							
Pallet Loader(s) [Forklifts]	0.66	4.01	0.37	341.29	lb/day	6		239.2	1442.5	133.2	122863.1	lb/yr							
Generator(s)	0.29	3.78	0.11	420.92	lb/day	6		104.2	1361.4	41.0	151531.1	lb/yr							
Pump(s)	0.76	4.91	0.40	420.92	lb/day	6		274.5	1768.2	142.4	151531.1	lb/yr							
Pickup(s)	0.02	0.03	0.00	39.26	lb/day	8		11.0	13.9	1.9	18842.4	lb/yr							
Excavator(s)	0.42	3.22	0.19	324.22	lb/day	6		152.8	1160.9	69.1	116719.9	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	75	employees	103.5	130.5	18.0	176647.5	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	240	VMT/yr	-	-	215.5	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	240	VMT/yr	-	-	67.8	-	lb/yr							
Total								**1774.5**	**13647.7**	**1036.3**	**1413211.9**	**lb/yr**						2000	lb/ton
Total								**29.6**	**227.5**	**17.3**	**23553.5**	**lb/day**							
[6, 7]Reconstruct Garden Hwy/Install Surface Drainage (concurrent with [4,5])						0	yd3						1.0	6.0	162.0	6.0	27.0	days	
Mobile Sources														*assumes haul load=14 yd3	*assumes haul trucks drive 10 miles each day				
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	6	trucks	0.4	5.2	0.2	662.7	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	162	trips	4.2	2.9	0.0	79.8	lb/yr						0.00220462	lb/gram
Backhoe(s)	0.21	1.38	0.07	312.85	lb/day	2		11.1	74.3	3.5	16893.7	lb/yr							
Drill Rig(s)	0.20	2.34	0.08	426.61	lb/day	1		5.5	63.1	2.3	11518.4	lb/yr							
Roller(s)	0.65	3.99	0.35	318.53	lb/day	2		35.1	215.3	18.7	17200.8	lb/yr							
Paver(s)	0.84	4.94	0.44	352.66	lb/day	1		22.6	133.4	11.8	9521.9	lb/yr							
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	3		24.0	223.7	8.4	26262.0	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	75	employees	46.6	58.7	8.1	79491.4	lb/yr						0.00220462	lb/gram
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	26244	VMT/yr	-	-	7,410.7	-	lb/yr							
Total								**149.5**	**776.6**	**7463.6**	**161630.7**	**lb/yr**						2000	lb/ton
Total								**5.5**	**28.8**	**276.4**	**5986.3**	**lb/day**							
[8]Site Restoration/Demobilization						0	yd3						4.0	6.0	816.0	24.0	34.0	days	
Mobile Sources														*assumes haul load=14 yd3	*assumes trucks drive 5 miles/day				
Haul Truck(s)	1.10	14.47	0.56	1855.42	g/mile	6	trucks	2.0	26.0	1.0	3337.8	lb/yr						0.00220462	lb/gram
Haul Truck(s)	11.78	8.18	0.02	223.55	g/trip	204	trips	5.3	3.7	0.0	100.5	lb/yr						0.00220462	lb/gram
Off-Highway Truck(s)	0.30	2.76	0.10	324.22	lb/day	6		60.5	563.4	21.2	66141.3	lb/yr							
Water Truck(s)	0.10	1.27	0.05	163.47	lb/day	6		20.4	259.1	10.2	33347.9	lb/yr							
Employee Trips	0.02	0.03	0.00	39.26	lb/day/emp	60	employees	46.9	59.2	8.2	80080.2	lb/yr							
Fugitive Sources																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	4896	VMT/yr	-	-	4,395.2	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr							
Total								**195.6**	**1474.7**	**4456.9**	**183007.8**	**lb/yr**						2000	lb/ton
Total								**5.8**	**43.4**	**131.1**	**5382.6**	**lb/day**							
2010 calendar year																			
Total from SEL								**8.2**	**49.5**	**690.3**	**5571.7**	**TPY**	to occur during 2010 calendar year						
Total from SEL								**131.1**	**807.1**	**6634.9**	**-**	**Worst-case lb/day**	*assumes some phases will be conducted concurrently						

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

Phase 4a Alternative Comparison Summary

Alternative 1

Total Phase 4a Sac Co	**11.7**	**69.0**	**877.4**	**7903.0**	**TPY**	to occur during 2010 calendar year
Total Phase 4a Sac Co	**198.6**	**1195.6**	**10169.3**	**-**	**Worst-case lb/day**	
Total Phase 4a Sut Co	**0.3**	**1.4**	**4.2**	**175.6**	**TPY**	to occur during 2010 calendar year
Total Phase 4a Sut Co	**12.0**	**58.9**	**627.6**	**-**	**Worst-case lb/day**	
Total Phase 4a	**11.9**	**70.4**	**881.7**	**8078.6**	**TPY**	to occur during 2010 calendar year
Total Phase 4a	**210.6**	**1254.5**	**10796.9**	**-**	**Worst-case lb/day**	
Mitigation Reductions	**5%**	**20%**	**75%**	**-**		
Mitigated Phase 4a Sac Co	**11.1**	**55.2**	**219.4**	**7903.0**	**TPY**	to occur during 2010 calendar year
Mitigated Phase 4a Sac Co	**188.7**	**956.5**	**2542.3**	**-**	**Worst-case lb/day**	
Mitigated Phase 4a Sut Co	**0.2**	**1.2**	**1.1**	**175.6**	**TPY**	to occur during 2010 calendar year
Mitigated Phase 4a Sut Co	**11.4**	**47.1**	**156.9**	**-**	**Worst-case lb/day**	
Total Mitigated Phase 4a	**11.3**	**56.3**	**220.4**	**8078.6**	**TPY**	to occur during 2010 calendar year
Total Mitigated Phase 4a	**200.1**	**1003.6**	**2699.2**	**-**	**Worst-case lb/day**	

Alternative 2

Total Phase 4a Sac Co	**10.1**	**61.6**	**756.2**	**7038.3**	**TPY**	to occur during 2010 calendar year
Total Phase 4a Sac Co	**176.4**	**1093.1**	**8362.0**	**0.0**	**Worst-case lb/day**	
Total Phase 4a Sut Co	**0.3**	**1.4**	**4.2**	**175.6**	**TPY**	to occur during 2010 calendar year
Total Phase 4a Sut Co	**12.0**	**58.9**	**627.6**	**-**	**Worst-case lb/day**	
Total Phase 4a	**10.3**	**63.0**	**760.4**	**7213.9**	**TPY**	to occur during 2010 calendar year
Total Phase 4a	**188.5**	**1152.0**	**8989.6**	**-**	**Worst-case lb/day**	
Mitigation Reductions	**5%**	**20%**	**75%**	**-**		
Mitigated Phase 4a Sac Co	**9.6**	**49.3**	**189.0**	**7038.3**	**TPY**	to occur during 2010 calendar year
Mitigated Phase 4a Sac Co	**167.6**	**874.5**	**2090.5**	**-**	**Worst-case lb/day**	
Mitigated Phase 4a Sut Co	**0.2**	**1.2**	**1.1**	**175.6**	**TPY**	to occur during 2010 calendar year
Mitigated Phase 4a Sut Co	**11.4**	**47.1**	**156.9**	**-**	**Worst-case lb/day**	
Total Mitigated Phase 4a	**9.8**	**50.4**	**190.1**	**7213.9**	**TPY**	to occur during 2010 calendar year
Total Mitigated Phase 4a	**179.0**	**921.6**	**2247.4**	**-**	**Worst-case lb/day**	

TIPS FOR USE:

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 Emissons Mitigation Fee Calculation

PART 1: PROJECT INFORMATION

Project Name:	SAFCA - Phase 4 - 2010 NLIP Construction Emissions within SMAQMD's Jurisdiction
Control/Application #:	

Single Family Dwelling Units:		*Note: Enter information only in blue bordered cells*	
Multi Family Dwelling Units:		Total Residential Acreage:	
Non-residential Square Feet:		Total Non-residential Acreage:	

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)
2010	SEL	909.57	727.65	642.65	140	89971.36
2010	Riverside	100.96	80.77	0	65	0.00
2010	Pumping Plants	160.71	128.57	43.57	40	1742.85
2010	Borrow Site Activity	24.35	19.48	0	30	0.00
	Total project Nox over threshold (lbs)		*91714.21*			
	Total project Nox over threshold (tons)		*45.86*			

PART 3: MITIGATION FEE RESULTS

TOTAL MITIGATION FEE ($16,000/TON)*	***$733,714***
Administrative Fee (5%)	***$36,686***
TOTAL MITIGATION FEE	***$770,399***

>>> *Fee is to be paid to the SMAQMD prior to any ground disturbance either in total or on a by acre basis.*

Mitigation Fee ($/acre)	**-**

* Assumes a construction mitigation plan which achieves a 20% 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.

Conformity: Regionally Significant Thresholds Calculations

2006 Estimated Annual Average Emissions

SACRAMENTO COUNTY

ROG	CO	NOX	PM10	
64.4	**365.95**	**81.78**	**44.43**	ton/day
23506.00	133571.8	29849.70	16216.95	tpy
2350.60	13357.18	2984.97	1621.70	10% of total

SUTTER COUNTY

ROG	CO	NOX	PM10	
10.34	**43.06**	**20.27**	**14.45**	ton/day
3774.10	15716.90	7398.55	5274.25	tpy
377.41	1571.69	739.86	527.43	10% of total

Equipment Type	Emission Rates for Year 2009									
	ROG	NOX	PM10	CO2	Unit	ROG	NOX	PM10	CO2	Unit
Employee Light-Duty Trucks	0.026	0.033	0.004	39.231	lb/day/employee					
Haul Trucks	1.19	15.82	0.62	1847.96	g/mile	12.14	8.36	0.02	229.92	g/trip
Backhoes	0.2213	1.4909	0.0779	312.8458	lb/day					
Bore/Drill Rigs	0.2148	2.7743	0.0877	426.6079	lb/day					
Concrete/Industrial Saws	0.5200	3.3866	0.2001	415.2317	lb/day					
Cranes	0.2729	2.6974	0.1045	244.5885	lb/day					
Crawler Tractors	0.5212	4.8719	0.2034	369.7268	lb/day					
Crushing/Proc. Equipment	0.6892	5.4543	0.3030	443.6719	lb/day					
Dozer	0.4924	4.4337	0.1889	335.5979	lb/day					
Excavator	0.4846	3.7349	0.2166	324.2221	lb/day					
Forklifts, Rough Terrain	0.7685	4.5324	0.4144	341.2863	lb/day					
Grader	0.5486	4.2871	0.2425	346.9745	lb/day					
Loaders, Rubber Tired	0.4801	3.7667	0.2122	307.1577	lb/day					
Off-Highway Trucks	0.3245	3.1661	0.1170	324.2222	lb/day					
Other Construction Equip.	0.6859	4.3122	0.3678	352.6626	lb/day					
Pavers	0.9293	5.4283	0.4711	352.6623	lb/day					
Paving Equipment	0.7885	4.6169	0.3992	301.4696	lb/day					
Rollers	0.7364	4.4281	0.3800	318.5338	lb/day					
Scraper	0.5061	4.8366	0.1955	409.5437	lb/day					
Signal Boards	2.0363	4.6463	0.4849	443.6722	lb/day					
Skid Steer Loaders	1.2375	3.1296	0.3184	312.8459	lb/day					
Surfacing Equipment	0.2415	2.6507	0.0953	255.9647	lb/day					
Tractors	0.2213	1.4909	0.0779	312.8458	lb/day					
Trenchers	1.1030	6.5422	0.5508	426.6081	lb/day					
Water Trucks	0.11	1.39	0.05	162.82	lb/day					
Fugitive Dust			10		lb/acre/day					
Assumptions: Emission factors from the Road Construction Emissions Model, Version 6.3 (SMAQMD 2008) for model year 2009 which assumes equipment operates 8hrs/day										

Equipment Type	Emission Rates for Year 2010									
	ROG	NOX	PM10	CO2	Unit	ROG	NOX	PM10	CO2	Unit
Employee Light-Duty Trucks	0.023	0.029	0.004	39.255	lb/day/employee					
Haul Trucks	1.10	14.47	0.56	1855.42	g/mile	11.78	8.18	0.02	223.55	g/trip
Backhoes	0.2057	1.3752	0.0650	312.8457	lb/day					
Bore/Drill Rigs	0.2041	2.3385	0.0841	426.6076	lb/day					
Compactor	0.2862	1.7983	0.0856	244.5886	lb/day					
Concrete/Industrial Saws	0.5051	3.2230	0.1580	415.2317	lb/day					
Cranes	0.2472	2.4061	0.0929	244.5885	lb/day					
Crawler Tractors	0.5212	4.8719	0.2034	369.7268	lb/day					
Crushing/Proc. Equipment	0.6290	4.9396	0.2837	443.6723	lb/day					
Dozer	0.4579	4.0586	0.1731	335.5978	lb/day					
Excavator	0.4244	3.2247	0.1920	324.2219	lb/day					
Forklifts, Rough Terrain	0.6643	4.0071	0.3701	341.2864	lb/day					
Generator	0.2894	3.7816	0.1139	420.9198	lb/day					
Grader	0.4893	3.7944	0.2197	346.9744	lb/day					
Loaders, Rubber Tired	0.4274	3.3309	0.1924	307.1577	lb/day					
Off-Highway Trucks	0.2966	2.7615	0.1037	324.2222	lb/day					
Other Construction Equip.	0.5774	3.7753	0.3236	352.6627	lb/day					
Pavers	0.8357	4.9393	0.4357	352.6628	lb/day					
Paving Equipment	0.7097	4.2031	0.3702	301.4698	lb/day					
Pump	0.7626	4.9115	0.3956	420.9197	lb/day					
Rollers	0.6495	3.9873	0.3469	318.5338	lb/day					
Scraper	0.4645	4.3611	0.1762	409.5438	lb/day					
Signal Boards	1.8307	4.5214	0.4462	443.6723	lb/day					
Skid Steer Loaders	0.9654	3.0209	0.2663	312.8459	lb/day					
Surfacing Equipment	0.2142	2.3732	0.0856	255.9648	lb/day					
Tractors	0.2057	1.3752	0.0650	312.8457	lb/day					
Trenchers	0.9928	5.9689	0.5107	426.6079	lb/day					
Water Trucks	0.10	1.27	0.05	163.47	lb/day					
Fugitive Dust			10		lb/acre/day					
Assumptions: Emission factors from the Road Construction Emissions Model, Version 6.3 (SMAQMD 2008) for model year 2010 which assumes equipment operates 8hrs/day										

Travel on Unpaved Haul Roads (Heavy Duty Trucks):		
E(lbs/VMT)=(k)(s/12)^a (W/3)^b	*AP-42 12/03, 13.2.2-4 eq 1a	
Where:	**PM10**	
k=Particle Size Multiplier:	1.5	*AP-42 12/03 Table 13.2.2-2; PM10 emissions; industrial roads
s=Silt Content:	4.3	*AP-42 12/03 Table 13.2.2-1, service road
empirical constants		
a	0.9	*AP-42 12/03 Table 13.2.2-2; PM10 emissions; industrial roads
b	0.45	*AP-42 12/03 Table 13.2.2-2; PM10 emissions; industrial roads
W=Vehicle Weight:	11.375	((2+1.25 T/cy*15 cy truck capacity) + 2)/2 (average weight of loaded and unloaded haul truck; assumed empty truck weighs 2 tons)
	1.08	lbs/VMT
E(ext)= E[(365-P)/365]	*AP-42 12/03 12.2.2-4 eq 2	
Where:		
P=# days/yr with >=0.01 in. precip	63	CALIFORNIA (June 2005)
	0.90	lbs/VMT
Travel on Paved Haul Roads (Heavy Duty Trucks):		
E(lbs/VMT)=(k) (sL/2)^.65 (W/3)^1.5 -	*AP-42 12/03, 13.2.1-4 eq 1	
Where:	**PM10**	
k=Particle Size Multiplier (lb/VMT)	0.016	*AP-42 12/03 Table 13.2.1-1; PM10 emissions; industrial roads
sL=road surface silt loading (g/m2)	8.2	*AP-42 12/03 Table 13.2.1-4; quarry roads
W=Vehicle Weight:	11.375	((2+1.25 T/cy*15 cy truck capacity) + 2)/2 (average weight of loaded and unloaded haul truck; assumed empty truck weighs 2 tons)
C=exhaust, break, tire wear (lb/VMT)	0.00047	*AP-42 12/03 Table 13.2.1-2; PM10 emissions
	0.30	lbs/VMT
E(ext)= E[1-(P/4N)]	*AP-42 12/03 13.2.1 eq 2	
Where:		
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,
N=number of days in averaging period	365	
	0.28	lbs/VMT
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		
piles, 4. loadout of material through batch or drop operations (AP-42 12/03, chapt. 13.2.4).		
*E(lb/ton)=(k)(0.0032)(U/5)^1.3 /(M/2)^*	*AP-42 12/03, 13.2.4-3 eq 1	
Where:	**PM10**	
k=Particle Size Multiplier:	0.35	*AP-42 12/03 13.2.4-3; PM10 emissions
U=mean wind speed (mph)	8	(http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#CALIFORNIA)
M=moisture content (%):	2.4	*AP-42 7/98 Table 11.9-3, haul truck
	0.002	lbs/ton
Batch Loading at Borrow Area		
E(TSP<15 um)=(.119/(M^0.9))	*AP-42 7/98, Table 11.9-1	
Where:	**PM10**	
M=moisture content (%):	2.4	*AP-42 7/98 Table 11.9-3, haul truck
	0.05	lb/ton
*E(TSP<10um)=(E(TSP<15 um)*S)*	*AP-42 7/98, Table 11.9-1	
S=scaling factor	0.75	*AP-42 7/98 Table 11.9-3, haul truck
	0.04	lb/ton
Truck Unloading		
E(TSP<15 um)	**PM10**	
Where:	**0.007**	lb/ton *AP-42 7/98 Table 11.9-4, end dump truck unloading (batch drop)
*E(TSP<10um)=(E(TSP<15 um)*S)*	*AP-42 7/98, Table 11.9-1	
S=scaling factor	0.75	*AP-42 7/98 Table 11.9-1, haul truck
	0.005	lb/ton
Bulldozing	**PM10**	
E(TSP<15 um)=(18.6(s)^1.5)/(M^1.4)	*AP-42 7/98, Table 11.9-1	
Where:		
M=moisture content (%):	7.9	*AP-42 7/98 Table 11.9-3, bulldozer
s=silt content (%)	6.9	*AP-42 7/98 Table 11.9-3, bulldozer
	18.67	lb/hr
*E(TSP<10um)=(E(TSP<15 um)*S)*	*AP-42 7/98, Table 11.9-1	
S=scaling factor	0.75	*AP-42 7/98 Table 11.9-1, bulldozer
	14.00	lb/hr
Scraper Unloading	**PM10**	
E(TSP<15 um)	**0.04**	lb/ton *AP-42 7/98 Table 11.9-4, scraper unloading
*E(TSP<10um)=(E(TSP<15 um)*S)*	*AP-42 7/98, Table 11.9-1	
S=scaling factor	0.75	*AP-42 7/98 Table 11.9-1, bulldozer/haul truck
	0.03	lb/ton