

APPENDIX E

Air Quality Modeling Results

Unmitigated 2009 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		
NCC	20	106	184	4	25	117	1430	SEL	58	354	4714	4	26	342	694		
SEL	42	252	3361	3	18	244	495	Elkhorn GGS	9	75	113	1	6	1	597		
PGCC	17	159	341	1	11	16	816	NEMDC	31	195	306	1	8	13	581		
TOTAL	79	517	3885	8	55	377	2741	TOTAL	98	623	5133	6	40	356	1872		

Mitigated 2009 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		
% Reduction	5%	20%	75%	5%	20%	75%	-	% Reduction	5%	20%	75%	5%	20%	75%	-		
TOTAL	74.6	413.3	971.4	7.4	43.7	94.3	-	TOTAL	93.3	498.7	1283.3	5.9	32.3	89.0	-		
Threshold Significant?	25 Y	25 Y	80 Y	25 N	25 Y	- -	- -	Threshold Significant?	- -	85 Y	- Y	25 N	25 Y	100 N	- -		

*PM10 emissions would likely result in or substantially contribute to a violation of the CAAQS (50 ug/m3)

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*Post-construction mitigation fee payment

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SEL Phases 2 & 3	*2009 calendar year comprises reach 1-9b work to occur over 8 months (April - Nov)							Sutter Portion of Reach 4a: 8232.0 ft					Sutter Co total of SEL work in 2009: 19232 ft					41.6%	total length of 1-9b				
								Sacramento Portion of Reach 4a: 1568.0 ft					Sac Co total of SEL work in 2009: 26978 ft					58.4%	46210 ft				
	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					
Loader(s)	0.48	3.77	0.21	307.16	lb/day	2		25.9	203.4	11.5	16586.5	lb/yr											
Drill Rig(s)	0.21	2.77	0.09	426.61	lb/day	1		5.8	74.9	2.4	11518.4	lb/yr											
Roller(s)	0.74	4.43	0.38	318.53	lb/day	2		39.8	239.1	20.5	17200.8	lb/yr											
Paver(s)	0.93	5.43	0.47	352.66	lb/day	1		25.1	146.6	12.7	9521.9	lb/yr											
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	4		35.0	341.9	12.6	35016.0	lb/yr											
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	6	trucks	4.3	56.5	2.2	6600.0	lb/yr						0.00220462	lb/gram				
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	162	trips	4.3	3.0	0.0	82.1	lb/yr						0.00220462	lb/gram				
Employee Trips	0.03	0.03	0.00	39.23	g/mile	60	employees	3.8	4.7	0.6	5604.5	lb/yr					40.0 per employee	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	1620	VMT/yr	-	-	457.4	-	lb/yr											
Total								155.9	1150.7	524.2	119023.9										2000 lb/ton		
Total								5.8	42.6	19.4	4408.3	lb/day											
[7]Construct Relief Wells (concurrent with [4,5,6])						0	yd3						0.0	0.0	5.0	5.0	30.0	days					
Mobile Sources															*assumes haul load=14 yd3	*assumes trucks drive 5 miles/day							
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	5		48.7	474.9	17.6	48633.3	lb/yr											
Drill Rig(s)	0.21	2.77	0.09	426.61	lb/day	2		12.9	166.5	5.3	25596.5	lb/yr											
Employee Trips	0.03	0.03	0.00	39.23	g/mile	60	employees	4.2	5.3	0.6	6227.2	lb/yr					40.0 per employee	0.00220462	lb/gram				
Fugitive Sources																							
Travel on unpaved roads	-	-	0.90	-	lb/VMT	750	VMT/yr	-	-	673.3	-	lb/yr											
Travel on paved roads	-	-	0.28	-	lb/VMT	0	trucks	-	-	-	-	lb/yr											
Total								65.8	646.6	696.7	80457.0										2000 lb/ton		
Total								2.2	21.6	23.2	2681.9	lb/day											
[8]Site Restoration/Demobilization						0	yd3						0.1	0.0	5.0	5.0	34.0	days					
Mobile Sources															*assumes haul load=14 yd3	*assumes trucks drive 5 miles/day							
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	7		77.2	753.5	27.9	77164.9	lb/yr											
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	3		1.3	17.8	0.7	2077.8	lb/yr							0.00220462	lb/gram			
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	102	trips	2.7	1.9	0.0	51.7	lb/yr							0.00220462	lb/gram			
Employee Trips	0.03	0.03	0.00	39.23	g/mile	60	employees	4.8	6.0	0.7	7057.5	lb/yr					40.0 per employee	0.00220462	lb/gram				
Fugitive Sources																							
Travel on unpaved roads	-	-	0.90	-	lb/VMT	510	VMT/yr	-	-	457.8	-	lb/yr											
Travel on paved roads	-	-	0.28	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr											
Total								86.0	779.1	487.1	86351.8										2000 lb/ton		
Total								2.5	22.9	14.3	2539.8	lb/day											
2009 calendar year																							
Total from SEL								7.2	43.8	586.2	1188.2	TPY	to occur during 2009 calendar year										
Total from SEL								99.8	605.8	8075.2	-	Worst-case lb/day	*assumes some phases will be conducted concurrently										
Emissions to occur in Sutter County								42%	3.0	18.2	244.0	494.5	TPY	to occur during 2009 calendar year									
Emissions to occur in Sacramento County								58%	4.2	25.5	342.2	693.7	TPY	to occur during 2009 calendar year									
Emissions to occur in Sutter County								42%	41.5	252.1	3360.8	-	Worst-case lb/day	*assumes some phases will be conducted concurrently									
Emissions to occur in Sacramento County								58%	58.3	353.7	4714.4	-	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

PGCC													*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)							
*assumes all activity to occur in Sutter 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		
Cutoff Wall Construction																				
[1]Clearing and Grubbing/Stripping (concurrent with [2])						0	yd3						0.0	0.0	5.0	5.0	10.0	days		
<u>Mobile Sources</u>													*assumes haul load=14 yd3 *assumes haul trucks drive 5 miles each day							
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	15	trucks	2.0	26.2	1.0	3055.5	lb/yr							0.00220462	lb/gram
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	150	trips	4.0	2.8	0.0	76.0	lb/yr							0.00220462	lb/gram
Water Truck(s)	0.11	1.39	0.05	162.82	lb/day	2		2.1	27.9	1.1	3256.3	lb/yr								
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	8		40.5	386.9	15.6	32763.5	lb/yr								
Loader(s)	0.48	3.77	0.21	307.16	lb/day	4		19.2	150.7	8.5	12286.3	lb/yr								
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	0.5	0.6	0.1	691.9	lb/yr				40.0	per employee	0.00220462	lb/gram	
<u>Fugitive Sources</u>																				
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	trucks	-	-	-	-	lb/yr								
Travel on paved roads	-	-	0.28	-	lb/VMT	15	trucks	-	-	211.8	-	lb/yr								
Total								68.2	595.0	238.1	52129.6	lb/yr							2000	lb/ton
Total								6.8	59.5	23.8	5213.0	lb/day								
[2]Borrow Site Preparation (concurrent with [1])																				
[2]Borrow Site Preparation (concurrent with [1])						0	yd3						0.0	0.0	0.0	0.0	5.0	days		
<u>Mobile Sources</u>													*assumes haul load=14 yd3							
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	4		10.1	96.7	3.9	8190.9	lb/yr								
Water Truck(s)	0.11	1.39	0.05	162.82	lb/day	1		0.5	7.0	0.3	814.1	lb/yr							0.00220462	lb/gram
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	0.2	0.3	0.0	346.0	lb/yr				40.0	per employee	0.00220462	lb/gram	
Total								10.9	104.0	4.2	9350.9	lb/yr							2000	lb/ton
Total								2.2	20.8	0.8	1870.2	lb/day								

PGCC	*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)																	
*assumes all activity to occur in Sutter 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
[3]Working Surface/Cutoff Wall Construction					Brookfield	20000	yd3						3.0	1428.6	4285.7	85.7	50.0	days
Mobile Sources															*assumes haul load=14 yd3			
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	4		96.9	747.0	43.3	64844.4	lb/yr						
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	15		379.5	3627.5	146.6	307157.8	lb/yr						
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	3	trucks	11.3	149.5	5.9	349.2	lb/yr						0.00220462 lb/gram
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	1429	trips	38.2	26.3	0.1	724.1	lb/yr						0.00220462 lb/gram
Loader(s)	0.48	3.77	0.21	307.16	lb/day	3		72.0	565.0	31.8	46073.7	lb/yr						
Other Equipment	0.69	4.31	0.37	352.66	lb/day	4		137.2	862.4	73.6	70532.5	lb/yr						
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		32.4	316.6	11.7	32422.2	lb/yr						
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	2.3	2.9	0.4	3459.6	lb/yr				40.0	per employee	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	4286	VMT/yr	-	-	1,210.2	-	lb/yr						
Total								769.9	6297.3	1523.5	525563.4	lb/yr						2000 lb/ton
Total								15.4	125.9	30.5	10511.3	lb/day						
[4]Demobilization						0	yd3						0.1	0.0	5.0	5.0	12.0	days
Mobile Sources															*assumes haul load=14 yd3	*assumes trucks drive 5 miles/day		
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	4		15.6	152.0	5.6	15562.7	lb/yr						
Loader(s)	0.48	3.77	0.21	307.16	lb/day	1		5.8	45.2	2.5	3685.9	lb/yr						
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	2		0.3	4.2	0.2	488.9	lb/yr						0.00220462 lb/gram
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	24	trips	0.6	0.4	0.0	12.2	lb/yr						0.00220462 lb/gram
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	0.6	0.7	0.1	830.3	lb/yr				40.0	per employee	0.00220462 lb/gram
Fugitive Sources																		
Travel on unpaved roads	-	-	0.90	-	lb/VMT	120	VMT/yr	-	-	107.7	-	lb/yr						
Travel on paved roads	-	-	0.28	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr						
Total								22.9	202.5	8.4	20579.9	lb/yr						2000 lb/ton
Total								1.9	16.9	0.7	1715.0	lb/day						
Levee Slope Flattening & Widening																		
[1]Clearing and Grubbing/Stripping						0	yd3						0.0	0.0	5.0	5.0	30.0	days
Mobile Sources															*assumes haul load=14 yd3	*assumes haul trucks drive 5 miles each day		
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	7	trucks	2.8	36.6	1.4	4277.8	lb/yr						0.00220462 lb/gram
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	210	trips	5.6	3.9	0.0	106.4	lb/yr						0.00220462 lb/gram
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		19.5	63.3	2.3	6484.4	lb/yr						
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	10		151.8	1451.0	58.6	122863.1	lb/yr						
Loader(s)	0.48	3.77	0.21	307.16	lb/day	2		28.8	226.0	12.7	18429.5	lb/yr						
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	1.4	1.8	0.2	2075.7	lb/yr				40.0	per employee	0.00220462 lb/gram
Fugitive Sources																		
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	trucks	-	-	-	-	lb/yr						
Travel on paved roads	-	-	0.28	-	lb/VMT	15	trucks	-	-	635.3	-	lb/yr						
Total								209.9	1782.6	710.7	154236.9	lb/yr						2000 lb/ton
Total								7.0	59.4	23.7	5141.2	lb/day						
[2,3]Levee Raising/Slope Flattening/Widening/Borrow Site Excavation					Brookfield	469205	yd3						3.0	33514.6	100543.9	1182.9	85.0	days
Mobile Sources															*assumes haul load=14 yd3			
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	2		82.4	634.9	36.8	55117.7	lb/yr						
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	13		559.2	5344.5	216.0	452545.8	lb/yr						
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	4	trucks	264.4	3507.1	137.4	4819.1	lb/yr						0.00220462 lb/gram
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	33515	trips	38.2	26.3	0.1	724.1	lb/yr						0.00220462 lb/gram
Loader(s)	0.48	3.77	0.21	307.16	lb/day	2		81.6	640.3	36.1	52216.8	lb/yr						

PGCC	*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)																		
*assumes all activity to occur in Sutter 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	
Dozer(s)	0.49	4.43	0.19	335.60	lb/day	4		167.4	1507.4	64.2	114103.3	lb/yr							
Roller(s)	0.74	4.43	0.38	318.53	lb/day	2		125.2	752.8	64.6	54150.7	lb/yr							
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	4		110.3	1076.5	39.8	110235.6	lb/yr							
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	4.0	5.0	0.6	5881.2	lb/yr				40.0	per employee	0.00220462	lb/gram
<u>Fugitive Sources</u>																			
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr							
Travel on paved roads	-	-	0.28	-	lb/VMT	100544	VMT/yr	-	-	-	28,391.2	lb/yr							
Total								1432.7	13494.8	28986.8	849794.4	lb/yr							2000
Total								16.9	158.8	341.0	9997.6	lb/day							
[4]Finish Grading						0	yd3						0.0	0.0	0.0	0.0	10.0	days	
<u>Mobile Sources</u>																			
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		6.5	63.3	2.3	6484.4	lb/yr							
Grader(s)	0.55	4.29	0.24	346.97	lb/day	2		11.0	85.7	4.8	6939.5	lb/yr							
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	2		9.7	74.7	4.3	6484.4	lb/yr							
Employee Trips	0.03	0.03	0.00	39.23	g/mile	20	employees	0.5	0.6	0.1	691.9	lb/yr				40.0	per employee	0.00220462	lb/gram
Total								27.6	224.3	11.6	20600.3	lb/yr							2000
Total								2.8	22.4	1.2	2060.0	lb/day							
2009 calendar year																			
Total from PGCC								1.3	11.4	15.7	816.1	TPY	to occur during 2009 calendar year						
Total from PGCC								16.9	158.8	341.0	-	Worst-case lb/day							

NCC South Levee Phase 3 Improvements													*Construction of reaches 1-7 would occur in 2009.											
*All work would occur in Sutter 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						
Total								2.4	19.4	1.0	1879.6	lb/day												
Operating Road Construction						5000	yd3						0.1	357.1	35.7	3.6	10.0	days						
Mobile Sources						(*assumes 2,500 cy salvaged, and 2,500 cy imported)							(*assumes haul load = 14 yd3)											
Roller(s)	0.74	4.43	0.38	318.53	lb/day	2		14.7	88.6	7.6	6370.7	lb/yr												
Grader(s)	0.22	1.49	0.08	312.85	lb/day	2		2.2	14.9	0.8	3128.5	lb/yr	(*assumes that graders are used for 5 days)											
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	10	trucks	0.1	1.2	0.0	14.6	lb/yr						0.00220462	lb/gram					
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	357	trips	9.6	6.6	0.0	181.0	lb/yr						0.00220462	lb/gram					
Employee Trips	0.55	4.29	0.24	346.97	g/mile	55	employees	26.6	207.9	11.8	16828.9	lb/yr					40.0	per employee	0.00220462	lb/gram				
Fugitive Sources																								
Travel on unpaved roads	-	-	0.90	-	lb/VMT	2	trucks	-	-		32.1	-												
Travel on paved roads	-	-	0.28	-	lb/VMT	2	trucks	-	-		10.1	-												
Material Handling													Tons/yd3 (gravel/sand)		Tons/day									
Truck Loading of salvage material	-	-	0.04	-	lb/ton						253.7	-		1.25	625.00									
Truck Unloading at road installation	-	-	0.005	-	lb/ton						32.8	-		1.25	625.00									
Total								53.2	319.2	348.8	26523.6	lb/yr												
Total								5.3	31.9	34.9	2652.4	lb/day							2000	lb/ton				
2009 calendar year																								
Total from NCC								4	25	117	1430	TPY	to occur during 2009 calendar year											
Total from NCC								20	106	184	-	Worst-case	*assumes some phases will be conducted concurrently											

*These calculations represent worst-case emissions from construction activities associated with the NCC

GGG/Elkhorn Canal Relocation		*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)					*Assumes GGS and Elkhorn are constructed concurrently												
*assumes all activity 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	
Embankment & Access Rd Construction (Elkhorn+GGG)						2690	yd3						30.0	179.3	5380.0	597.8	56.0	days	
Mobile Sources																		*assumes haul load=15 yd3	
Dozer(s)	0.49	4.43	0.19	335.60	lb/day	2		55.1	496.6	21.2	37587.0	lb/yr							
Roller(s)	0.74	4.43	0.38	318.53	lb/day	4		164.9	991.9	85.1	71351.6	lb/yr							
Grader(s)	0.55	4.29	0.24	346.97	lb/day	2		61.4	480.2	27.2	38861.1	lb/yr							
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		36.3	354.6	13.1	36312.9	lb/yr							
Heavy-Duty Truck(s)	1.19	15.82	0.62	1847.96	g/mile	10	trucks	141.5	1876.6	73.5	219184.2	lb/yr						0.00220462 lb/gram	
Heavy-Duty Truck(s)	12.14	8.36	0.02	229.92	g/trip	179	trips	4.8	3.3	0.0	90.9	lb/yr						0.00220462 lb/gram	
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	2.0	2.5	0.3	2906.0	lb/yr				40.0	per employee	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	5380	VMT/yr	-	-	1,519.2	-	lb/yr							
Total								466.1	4205.6	1739.6	406293.7	lb/yr						2000 lb/ton	
Total								8.3	75.1	31.1	7255.2	lb/day							
Excavation & Trenching (GGG)						246000	yd3						0.0	16400.0	0.0	0.0	110.0	days	
Mobile Sources																		*assumes haul load=15 yd3	
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	4		222.7	2128.1	86.0	180199.2	lb/yr							
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	2		106.6	821.7	47.7	71328.9	lb/yr							
Water Truck(s)	0.11	1.39	0.05	162.82	lb/day	2		23.1	306.7	12.0	35819.5	lb/yr							
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	3.8	4.8	0.6	5708.3	lb/yr					40.0	per employee	0.00220462 lb/gram
Fugitive Sources													Tons/yr3 (gravel/sand)	Tons/day					
Scraper Unloading	-	-	0.03	-	lb/ton	0		-	-	9,225	-	lb/yr	1.25	2795.45					
Total								356.2	3261.3	9371.3	293055.8	lb/yr						2000 lb/ton	
Total								3.2	29.6	85.2	2664.1	lb/day							
Canal Lining (Elkhorn)						0	yd3						0.0	0.0	0.0	0.0	9.0	days	
Mobile Sources																		*assumes haul load=15 yd3	
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		5.8	57.0	2.1	5836.0	lb/yr							
Other Equipment	0.69	4.31	0.37	352.66	lb/day	1		6.2	38.8	3.3	3174.0	lb/yr							
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	0.3	0.4	0.0	467.0	lb/yr					40.0	per employee	0.00220462 lb/gram
Total								12.3	96.2	5.5	9477.0	lb/yr						2000 lb/ton	
Total								1.4	10.7	0.6	1053.0	lb/day							
Irrigation/Drainage Interconnections (Elkhorn+GGG)						0	yd3						0.0	0.0	0.0	0.0	13.0	days	
Mobile Sources																		*assumes haul load=15 yd3	
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	1		4.2	129.8	4.8	13293.1	lb/yr							
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	2		12.6	97.1	5.6	8429.8	lb/yr							
Grader(s)	0.55	4.29	0.24	346.97	lb/day	1		7.1	55.7	3.2	4510.7	lb/yr							
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	0.5	0.6	0.1	674.6	lb/yr					40.0	per employee	0.00220462 lb/gram
Total								24.4	283.2	13.7	26908.2	lb/yr						2000 lb/ton	
Total								1.9	21.8	1.1	2069.9	lb/day							
Erosion Control (Elkhorn+GGG)						24400	yd3						30.0	1626.7	48800.0	2218.2	22.0	days	
Mobile Sources																		*assumes haul load=15 yd3	
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	2	trucks	128.3	1702.2	66.7	9037.0	lb/yr						0.00220462 lb/gram	

GGG/Elkhorn Canal Relocation		*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)					*Assumes GGS and Elkhorn are constructed concurrently													
*assumes all activity 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		
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	1627	trips	43.5	30.0	0.1	824.5	lb/yr						0.00220462	lb/gram	
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		14.3	139.3	5.2	14265.8	lb/yr								
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	0.8	1.0	0.1	1141.7	lb/yr				40.0	per employee	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	48800	VMT/yr	-	-	13,779.9	-	lb/yr								
Total								15.0	140.3	5.3	15407.4	lb/yr							2000	lb/ton
Total								0.7	6.4	0.2	700.3	lb/day								
Irrigation Canal Abandonment (Elkhorn)						0	yd3						0.0	0.0	0.0	0.0	9.0	days		
Mobile Sources																				*assumes haul load=15 yd3
Loader(s)	0.48	3.77	0.21	307.16	lb/day	2		8.6	67.8	3.8	5528.8	lb/yr								
Compactor(s)	0.69	4.31	0.37	352.66	lb/day	2		12.3	77.6	6.6	6347.9	lb/yr								
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	0.3	0.4	0.0	467.0	lb/yr				40.0	per employee	0.00220462	lb/gram	
Total								21.3	145.8	10.5	12343.8	lb/yr							2000	lb/ton
Total								2.4	16.2	1.2	1371.5	lb/day								
Reclamation (GGS)						0	yd3						0.0	0.0	0.0	0.0	35.0	days		
Mobile Sources																				*assumes haul load=15 yd3
Backhoe(s)	0.22	1.49	0.08	312.85	lb/day	2		4.0	26.8	1.4	5631.2	lb/yr								
Water Truck(s)	0.11	1.39	0.05	162.82	lb/day	2		1.9	25.1	1.0	2930.7	lb/yr								
Employee Trips	0.03	0.03	0.00	39.23	g/mile	15	employees	1.2	1.5	0.2	1816.3	lb/yr				40.0	per employee	0.00220462	lb/gram	
Total								7.1	53.5	2.6	10378.2	lb/yr							2000	lb/ton
Total								0.2	1.5	0.1	296.5	lb/day								
Demobilization/Cleanup (Elkhorn+GGS)						0	yd3						0.0	0.0	0.0	0.0	3.0	days		
Mobile Sources																				*assumes haul load=15 yd3
Loader(s)	1.24	3.13	0.32	312.85	lb/day	1		11.1	28.2	2.9	2815.6	lb/yr								
Truck(s)	0.11	1.39	0.05	162.82	lb/day	5		4.7	62.7	2.5	7326.7	lb/yr								
Employee Trips	0.49	4.43	0.19	335.60	g/mile	15	employees	2.0	17.6	0.7	1331.8	lb/yr				40.0	per employee	0.00220462	lb/gram	
Total								17.8	108.5	6.1	11474.1	lb/yr							2000	lb/ton
Total								5.9	36.2	2.0	3824.7	lb/day								
2009 calendar year																				
Total from GGS Elkhorn Canal								0.7	6.4	0.7	597.0	TPY	to occur during 2009 calendar year							
Total from GGS Elkhorn Canal								8.8	75.1	113.0	-	Worst-case lb/day								

NEMDC		*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)																			
*assumes all activity 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			
[2,3]Cutoff Wall Construction/Levee Crown Restoration					East Side	167000	yd3						3.0	11928.6	35785.7	477.1	75.0	days			
Mobile Sources														*assumes haul load=14 yd3							
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	6		218.0	1680.7	97.5	145899.9	lb/yr									
Paver(s)	0.93	5.43	0.47	352.66	lb/day	1.00		0.9	0.0	0.4	0.0	lb/yr	*operates 1 day								
Roller(s)	0.74	4.43	0.38	318.53	lb/day	3		165.7	996.3	85.5	71670.1	lb/yr									
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	18	trucks	94.1	1248.3	48.9	1943.9	lb/yr							0.00220462		
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	11929	trips	319.3	219.9	0.4	6046.4	lb/yr							0.00220462		
Loader(s)	0.48	3.77	0.21	307.16	lb/day	8		288.0	2260.0	127.3	184294.6	lb/yr									
Other Equipment	0.69	4.31	0.37	352.66	lb/day	6		308.7	1940.5	165.5	158698.2	lb/yr									
Grader(s)	0.55	4.29	0.24	346.97	lb/day	3		123.4	964.6	54.6	78069.3	lb/yr									
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		48.7	474.9	17.6	48633.3	lb/yr									
Employee Trips	0.03	0.03	0.00	39.23	g/mile	25	employees	4.4	5.5	0.7	6486.7	lb/yr				40.0	per employee	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	35786	VMT/yr	-	-	10,105.0	-	lb/yr									
Total								1570.3	9790.7	10703.0	701742.4	lb/yr							2000		
Total								20.9	130.5	142.7	9356.6	lb/day									
[4]Demobilization						0	yd3						0.1	0.0	5.0	5.0	12.0	days			
Mobile Sources														*assumes haul load=14 yd3 *assumes trucks drive 5 miles/day							
Off-Highway Truck(s)	0.32	3.17	0.12	324.22	lb/day	4		15.6	152.0	5.6	15562.7	lb/yr									
Loader(s)	0.48	3.77	0.21	307.16	lb/day	1		5.8	45.2	2.5	3685.9	lb/yr									
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	2		0.3	4.2	0.2	488.9	lb/yr							0.00220462		
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	24	trips	0.6	0.4	0.0	12.2	lb/yr							0.00220462		
Employee Trips	0.03	0.03	0.00	39.23	g/mile	25	employees	0.7	0.9	0.1	1037.9	lb/yr				40.0	per employee	0.00220462	lb/gram		
Fugitive Sources																					
Travel on unpaved roads	-	-	0.90	-	lb/VMT	120	VMT/yr	-	-	107.7	-	lb/yr									
Travel on paved roads	-	-	0.28	-	lb/VMT	0	VMT/yr	-	-	-	-	lb/yr									
Total								17.2	157.5	113.6	17101.6	lb/yr							2000		
Total								1.4	13.1	9.5	1425.1	lb/day									
Levee Slope Flattening & Widening																					
[1]Clearing and Grubbing/Stripping						0	yd3						0.0	0.0	5.0	5.0	30.0	days			
Mobile Sources														*assumes haul load=14 yd3 *assumes haul trucks drive 5 miles each day							
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	2	trucks	0.8	10.5	0.4	1222.2	lb/yr							0.00220462		
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	60	trips	1.6	1.1	0.0	30.4	lb/yr							0.00220462		
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	1		9.7	31.7	1.2	3242.2	lb/yr									
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	2		30.4	290.2	11.7	24572.6	lb/yr									
Loader(s)	0.48	3.77	0.21	307.16	lb/day	1		14.4	113.0	6.4	9214.7	lb/yr									
Employee Trips	0.03	0.03	0.00	39.23	g/mile	25	employees	1.7	2.2	0.3	2594.7	lb/yr				40.0	per employee	0.00220462	lb/gram		
Fugitive Sources																					
Travel on unpaved roads	-	-	0.90	-	lb/VMT	0	trucks	-	-	-	-	lb/yr									
Travel on paved roads	-	-	0.28	-	lb/VMT	15	trucks	-	-	635.3	-	lb/yr									
Total								58.6	448.6	655.3	40876.9	lb/yr							2000		
Total								2.0	15.0	21.8	1362.6	lb/day									
[2,3]Levee Raiseing/Slope Flattening/Widening/Borrow Site Excavation					East Side	225000	yd3						3.0	16071.4	48214.3	567.2	85.0	days			
Mobile Sources														*assumes haul load=14 yd3							
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	1		41.2	317.5	18.4	27558.9	lb/yr									
Scraper(s)	0.51	4.84	0.20	409.54	lb/day	3		129.0	1233.3	49.8	104433.6	lb/yr									
Haul Truck(s)	1.19	15.82	0.62	1847.96	g/mile	1	trucks	126.8	1681.8	65.9	2310.9	lb/yr							0.00220462		
Haul Truck(s)	12.14	8.36	0.02	229.92	g/trip	16071	trips	319.3	219.9	0.4	6046.4	lb/yr							0.00220462		
Loader(s)	0.48	3.77	0.21	307.16	lb/day	1		40.8	320.2	18.0	26108.4	lb/yr									
Dozer(s)	0.49	4.43	0.19	335.60	lb/day	2		83.7	753.7	32.1	57051.7	lb/yr									
Roller(s)	0.74	4.43	0.38	318.53	lb/day	1		62.6	376.4	32.3	27075.4	lb/yr									
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	2		55.2	538.2	19.9	55117.8	lb/yr									

NEMDC		*Work to occur during 2009 is assumed to be phased over 8 months (April - Nov)																		
*assumes all activity 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		
Employee Trips	0.03	0.03	0.00	39.23	g/mile	25	employees	4.9	6.2	0.8	7351.5	lb/yr				40.0	per employee	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	48214	VMT/yr	-	-	13,614.5	-	lb/yr								
Total								863.5	5447.2	13852.2	313054.6	lb/yr							2000	lb/ton
Total								10.2	64.1	163.0	3683.0	lb/day								
[4] Finish Grading																				
						0	yd3						0.0	0.0	0.0	0.0	10.0	days		
Mobile Sources																				
Water Truck(s)	0.32	3.17	0.12	324.22	lb/day	1		3.2	31.7	1.2	3242.2	lb/yr								
Grader(s)	0.55	4.29	0.24	346.97	lb/day	1		5.5	42.9	2.4	3469.7	lb/yr								
Excavator(s)	0.48	3.73	0.22	324.22	lb/day	1		4.8	37.3	2.2	3242.2	lb/yr								
Employee Trips	0.03	0.03	0.00	39.23	g/mile	25	employees	0.6	0.7	0.1	864.9	lb/yr				40.0	per employee	0.00220462	lb/gram	
Total								14.2	112.6	5.9	10819.1	lb/yr							2000	lb/ton
Total								1.4	11.3	0.6	1081.9	lb/day								
2009 calendar year																				
Total from NEMDC								1.3	8.4	12.8	581.1	TPY	to occur during 2009 calendar year							
Total from NEMDC								31.1	194.6	305.7	-	Worst-case lb/day								

Construction Emissions Mitigation Fee Calculation

PART 1: PROJECT INFORMATION

Project Name:	SAFCA - Phase 3 - 2009 NLIP Construction Emissions within SMAQMD's Jurisdiction		
Control/Application #:			
Single Family Dwelling Units:		<i>Note: Enter information only in blue bordered cells</i>	
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)
2009	SEL	353.70	282.96	197.96	140	27714.67
2009	Elkhorn_GGS	75.10	60.08	0	56	0.00
2009	NEMDC	194.63	155.70	70.70	75	5302.68
		<i>Total project Nox over threshold (lbs)</i>		33017.35		
		<i>Total project Nox over threshold (tons)</i>		16.51		

PART 3: MITIGATION FEE RESULTS

TOTAL MITIGATION FEE (\$16,000/TON)**	\$264,139
Administrative Fee (5%)	\$13,207
TOTAL MITIGATION FEE	\$277,346

>>> *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)	-
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* 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.

Alternative 1

Unmitigated 2009 Emissions

Sutter County								Sacramento County							
Worst-Case lb/day				Worst-Case TPY				Worst-Case lb/day				Worst-Case TPY			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2		ROG	NOX	PM10	ROG	NOX	PM10	CO2
TOTAL	78.5	516.6	3885.4	7.8	54.7	377.1	2740.9	TOTAL	98.2	623.4	5133.1	6.3	40.4	356.0	1871.8

Mitigated 2009 Emissions

Sutter County								Sacramento County							
Worst-Case lb/day				Worst-Case TPY				Worst-Case lb/day				Worst-Case TPY			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2		ROG	NOX	PM10	ROG	NOX	PM10	CO2
% Reduction	5%	20%	75%	5%	20%	75%	-	% Reduction	5%	20%	75%	5%	20%	75%	-
TOTAL	74.6	413.3	971.4	7.4	43.7	94.3	-	TOTAL	93.3	498.7	1283.3	5.9	32.3	89.0	-
Threshold Significant?	Y	Y	Y	N	Y	-	-	Threshold Significant?	-	Y	Y	N	Y	N	-

*PM10 emissions would likely result in or substantially contribute to a violation of the CAAQS (50 ug/m3)

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*Post-construction mitigation fee payment = N

Alternative 2

% change borrow material relative to Alt 1

-45%

% change haul trips relative to Alt 1

-40%

Unmitigated 2009 Emissions

Sutter County								Sacramento County							
Worst-Case lb/day				Worst-Case TPY				Worst-Case lb/day				Worst-Case TPY			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2		ROG	NOX	PM10	ROG	NOX	PM10	CO2
TOTAL	43.2	284.1	2137.0	4.3	30.1	207.4	1507.5	TOTAL	54.0	342.9	2823.2	3.4	22.2	195.8	1029.5

Mitigated 2009 Emissions

Sutter County								Sacramento County							
Worst-Case lb/day				Worst-Case TPY				Worst-Case lb/day				Worst-Case TPY			
	ROG	NOX	PM10	ROG	NOX	PM10	CO2		ROG	NOX	PM10	ROG	NOX	PM10	CO2
% Reduction	5%	20%	75%	5%	20%	75%	-	% Reduction	5%	20%	75%	5%	20%	75%	-
TOTAL	41.0	227.3	534.2	4.1	24.0	51.9	-	TOTAL	51.3	274.3	705.8	3.3	17.8	49.0	-
Threshold Significant?	Y	Y	Y	N	N	-	-	Threshold Significant?	-	Y	Y	N	N	N	-

*PM10 emissions would likely result in or substantially contribute to a violation of the CAAQS (50 ug/m3)

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				Unit	ROG	NOX	PM10	CO2	Unit
	ROG	NOX	PM10	CO2						
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										
Travel on Unpaved Haul Roads (Heavy Duty Trucks):										
$E(\text{lbs/VMT})=(k)(s/12)^a (W/3)^b$	*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								
$E(\text{ext})=E[(365-P)/365]$	*AP-42 12/03 12.2.2-4 eq 2									
Where:										

$P = \# \text{ days/yr with } \geq 0.01 \text{ in. precip}$	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)						
	0.90	lbs/VMT						
Travel on Paved Haul Roads (Heavy Duty Trucks):								
$E(\text{lbs/VMT}) = (k) (sL/2)^{.65} (W/3)^{1.5} - ($	*AP-42 12/03, 13.2.1-4 eq 1							
Where:	PM10							
$k = \text{Particle Size Multiplier (lb/VMT)}$	0.016	*AP-42 12/03 Table 13.2.1-1; PM10 emissions; industrial roads						
$sL = \text{road surface silt loading (g/m}^2)$	8.2	*AP-42 12/03 Table 13.2.1-4; quarry roads						
$W = \text{Vehicle Weight:}$	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)						
$C = \text{exhaust, break, tire wear (lb/VMT)}$	0.00047	*AP-42 12/03 Table 13.2.1-2; PM10 emissions						
	0.30	lbs/VMT						
$E(\text{ext}) = E[1 - (P/4N)]$	*AP-42 12/03 13.2.1 eq 2							
Where:								
$P = \# \text{ days/yr with } \geq 0.01 \text{ in. precip}$	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)						
$N = \text{number of days in averaging period}$	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								
Emissions result from several distinct processes within the stockpiling cycle: 1. loading in of materials through batch or drop operations, 2. 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).								
$E(\text{lb/ton}) = (k)(0.0032)(U/5)^{1.3} / (M/2)^{.1}$	*AP-42 12/03, 13.2.4-3 eq 1							
Where:	PM10							
$k = \text{Particle Size Multiplier:}$	0.35	*AP-42 12/03 13.2.4-3; PM10 emissions						
$U = \text{mean wind speed (mph)}$	8	*NOAA Western Regional Climate Center, Sacramento International Airport ASOS station, CA RAWS data from 1996-2006 (http://www.wrcc.dri.edu/htmlfiles/westwind.final.html#CALIFORNIA)						
$M = \text{moisture content (%):}$	2.4	*AP-42 7/98 Table 11.9-3, haul truck						
	0.002	lbs/ton						
Batch Loading at Borrow Area								
$E(\text{TSP} < 15 \mu\text{m}) = (.119 / (M^{.9}))$	*AP-42 7/98, Table 11.9-1							
Where:	PM10							
$M = \text{moisture content (%):}$	2.4	*AP-42 7/98 Table 11.9-3, haul truck						
	0.05	lb/ton						
$E(\text{TSP} < 10 \mu\text{m}) = (E(\text{TSP} < 15 \mu\text{m}) * S)$	*AP-42 7/98, Table 11.9-1							
$S = \text{scaling factor}$	0.75	*AP-42 7/98 Table 11.9-3, haul truck						
	0.04	lb/ton						

