FINAL ENVIRONMENTAL IMPACT STATEMENT

408 PERMISSION AND 404 PERMIT TO THREE RIVERS LEVEE IMPROVEMENT AUTHORITY

FOR THE

FEATHER RIVER LEVEE REPAIR PROJECT, CALIFORNIA SEGMENT 2

APPENDIX I – AIR EMISSIONS CALCULATIONS FOR SEGMENT 2

October 2008

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APPENDIX I – AIR EMISSIONS CALCULATIONS FOR SEGMENT 2

Air Quality Emissions: Direct Effects

Air Quality Emissions: Indirect Effects

October 2008

Air Quality Emissions: Direct Effects

Unmitigated 2008 Emissions						
	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10
Mobile Sources	102	528	42	11	60	5
Fugitive Sources	-	-	3586	-	-	316
TOTAL	102	528	3627	11	60	320

Mitigated 2008 Emissions						
	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%
TOTAL	96.5	422.3	906.9	10.6	47.7	80.0
FRAQMD Threshold	25	25	80			
De Minimus Threshold				50	50	100
Significant Post-Mitigation?	Y	Y	Y	N	N	N
Regional SignificanceThreshold				310	280	289
Regionally Significant?				N	N	N

Unmitigated 2009 Emissions						
	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10
Mobile Sources	102	491	35	12	61	4
Fugitive Sources	-	-	3984	-	-	263
TOTAL	102	491	4019	12	61	267

Mitigated 2009 Emissions						
	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%
TOTAL	97.3	392.8	1004.8	11.8	48.5	66.8
FRAQMD Threshold	25	25	80			
De minimus Threshold				50	50	100
Significant Post-Mitigation?	Y	Y	Y	N	N	N
Regional SignificanceThreshold				310	280	289
Regionally Significant?				N	N	N

Unmitigated 2010 Emissions						
	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10
Mobile Sources	102	438	33	7	30	2
Fugitive Sources	-	-	3984	-	-	263
TOTAL	102	438	4017	7	30	265

Mitigated 2010 Emissions						
	Worst-Case lb/day			Tons/year		
	ROG	NOX	PM10	ROG	NOX	PM10
% Reduction	5%	20%	75%	5%	20%	75%
TOTAL	96.8	350.5	1004.2	6.4	23.7	66.3
FRAQMD Threshold	25	25	80			
De minimus Threshold				50	50	100
Significant Post-Mitigation?	Y	Y	Y	N	N	N
Regional SignificanceThreshold				310	280	289
Regionally Significant?				N	N	N

Note: Because the extent of the construction activity associated with levee degrading that would occur in 2009 and 2010 respectively was not known, emissions estimated for each calendar year may be double-counted.

Feather River Levee Segment 2 Unmitigated Fugitive PM10 Emissions (Years 2008-2010)													
Activity: M=Mobilization, F=Levee Foundatioin, E=Levee Embankment, B=Borrow, D=Demobilization, R=Removal of Existing Levee	**PM10**	**Unit**	**Quantity**	**Unit**	**PM10**	**Unit**	**Distance (miles/ round-trip)**	**# of Haul Loads**	**Total Miles Traveled**	**Total Miles Traveled/Day**	**Time frame**	**Conversion Factor**	
Putting Setback Levee in Place (2008 work)			3600000	yd3 (import from borrow)			4.0	180000.0	720000.0	4090.9	176.0	days	
			*(assumes 2 miles on average 1 way to/from borrow)					*(assumes haul load = 20 yd3)					
Fugitive Sources													
Travel on unpaved roads	0.90	lb/VMT	*(assumes 50% unpaved)		323,176.6	lb/yr							
Travel on paved roads	0.28	lb/VMT	*(assumes 50% paved)		101,655.2	lb/yr							
Material Handling							Tons/yd3 (gravel/sand)	Tons/day					
Truck Loading at Borrow	0.04	lb/ton			182654.6	lb/yr	1.25	25568.18					
Truck Unloading at Levee	0.005	lb/ton			23625.0	lb/yr	1.25	25568.18					
Total					**631111.4**	**lb/yr**						2000	lb/ton
Total					**3585.9**	**lb/day**							
Total					**315.6**	**tons/year**	to occur during 2008 calendar year						
Degrading Existing Levee (2009 work)			3000000.0	yd3 (borrow)			4.0	150000.0	600000.0	4545.5	132.0	days	
			*(assumes 2 miles on average 1 way to/from borrow)					*(assumes haul load = 20 yd3)					
Fugitive Sources													
Travel on unpaved roads	0.90	lb/VMT	*(assumes 50% unpaved)		269,313.8	lb/yr							
Travel on paved roads	0.28	lb/VMT	*(assumes 50% paved)		84,712.7	lb/yr							
Material Handling							Tons/yd3 (gravel/sand)	Tons/day					
Truck Loading at Levee	0.04	lb/ton			152212.2	lb/yr	1.25	28409.09					
Truck Unloading at Borrow	0.005	lb/ton			19687.5	lb/yr	1.25	28409.09					
Total					**525926.2**	**lb/yr**						2000	lb/ton
Total					**3984.3**	**lb/day**							
Total					**263.0**	**tons/year**	to occur during 2009 calendar year						
Degrading Existing Levee (2010 work)			3000000.0	yd3 (borrow)			4.0	150000.0	600000.0	4545.5	132.0	days	
			*(assumes 2 miles on average 1 way to/from borrow)					*(assumes haul load = 20 yd3)					
Fugitive Sources													
Travel on unpaved roads	0.90	lb/VMT	*(assumes 50% unpaved)		269,313.8	lb/yr							
Travel on paved roads	0.28	lb/VMT	*(assumes 50% paved)		84,712.7	lb/yr							
Material Handling							Tons/yd3 (gravel/sand)	Tons/day					
Truck Loading at Levee	0.04	lb/ton			152212.2	lb/yr	1.25	28409.09					
Truck Unloading at Borrow	0.005	lb/ton			19687.5	lb/yr	1.25	28409.09					
Total					**525926.2**	**lb/yr**						2000	lb/ton
Total					**3984.3**	**lb/day**							
Total					**263.0**	**tons/year**	to occur during 2010 calendar year						
Total from FRL Project					**841**	**Total Unmitigated Emissions (Tons)**	to occur during segment 2 construction						
Total from FRL Project					**3984**	**Worst-case lb/day**	to occur during segment 2 construction						
*These calculations represent worst-case emissions from construction activities associated with the FRL													
Note: Because the extent of the construction activity associated with levee degrading that would occur in 2009 and 2010 respectively was not known, emissions estimated for each calendar year may be double-counted.													

Road Construction Emissions Model

Version 5.2

Data Entry Worksheet

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C28.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Feather River Levee	
Construction Start Year	2008	Enter a Year between 2000 and 2010 inclusive
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	7	months
Predominate Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
On-Road Emission Factors: Enter 1, 2, 3, or 4	4	1. Emfac7fv1.1 4. Emfac2002 (default) 2. Emfac7G 3. Emfac2001
Project Length	5.7	miles
Total Project Area	232	acres
Maximum Area Disturbed/Day	3	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	18182	yd^3/day
Soil Exported	0	yd^3/day
Average Truck Capacity	20	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

	or User Override (for program calculated	
	Months	% Time
	0.7	10
	7.0	40
	2.5	35
	1.1	15

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C37 through C40.

Construction Periods	User Override of Construction Months	Program Calculated Months	2000	%	2001	%	2002	%	2003	%	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%	2010 adjusted	%	sum	
Grubbing/Land Clearing	0.00	0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
Grading/Excavation	7.00	2.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	7
Drainage/Utilities/Sub-Grade	0.00	2.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
Paving	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
Totals	7.00	7.00																										

Hauling emission default values can be overridden in cells C48 through C50.

Soil Hauling Emissions	User Override of Soil Hauling Defaults	Default Values			
User Input					
Miles/round trip	4	30		4	
Round trips/day		909		909.1	4
Vehicle miles traveled/day (calculated)			3636.4		

Hauling Emissions	**ROG**	**NOx**	**CO**	**PM10**
Emission rate (grams/mile)	0.75	8.63	7.25	0.27
Pounds per day	6.0	69.1	58.1	2.2
Tons per contruction period	0.46	5.32	4.47	0.17

Worker commute default values can be overridden in cells C62 through C67.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values			
Miles/ one-way trip	10	20			10
One-way trips/day		2			2
No. of employees: Grubbing/Land Clearing	0	17			0
No. of employees: Grading/Excavation	70	19			70
No. of employees: Drainage/Utilities/Sub-Grade	0	19			0
No. of employees: Paving	0	19			0

	ROG	**NOx**	**CO**	**PM10**	
Emission rate (grams/mile)	0.30	0.55	6.25	0.04	
Emission rate (grams/trip)	1.62	0.72	16.13	0.02	
Pounds per day - Grubbing/Land Clearing	0.0	0.0	0.0	0.0	
Tons per const. Period - Grub/Land Clear	0.0	0.0	0.0	0.0	
Pounds per day - Grading/Excavation	1.9	2.1	29.2	0.1	
Tons per const. Period - Grading/Excavation	0.1	0.2	2.2	0.0	
Pounds per day - Drainage/Utilities/Sub-Grade	0.0	0.0	0.0	0.0	
Tons per const. Period - Drain/Util/Sub-Grade	0.0	0.0	0.0	0.0	
Pounds per day - Paving	0.0	0.0	0.0	0.0	
Tons per const. Period - Paving	0.0	0.0	0.0	0.0	
tons per construction period	0.1	0.2	2.2	0.0	

Water truck default values can be overriden in cells C87 through C89 and E87 through E89.

Water Truck Emissions	Number of Water Trucks	Program Estimate of Number of Water Trucks	User Override of Water Truck Miles Traveled	Default Values Miles Traveled/Day	
Grubbing/Land Clearing - Exhaust	0	1		40	0
Grading/Excavation - Exhaust	2	1		40	80
Drainage/Utilities/Subgrade	0	1		40	0

	ROG	**NOx**	**CO**	**PM10**
Emission rate (grams/mile)	0.75	8.63	7.25	0.27
Pounds per day - Grubbing/Land Clearing	0.0	0.0	0.0	0.0
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.1	1.5	1.3	0.0
Tons per const. Period - Grading/Excavation	0.01	0.12	0.10	0.00
Pound per day - Drainage/Utilities/Subgrade	0.0	0.0	0.0	0.0
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00

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Fugitive dust default values can be overridden in cells C104 and C105.

Fugitive PM10 Dust	User Override of Max Acreage/Day	Default Maximum Acreage/Day	pounds/day	tons/per period	
Fugitive Dust - Grubbing/Land Clearing	0	3	0.0	0.0	0
Fugitive Dust - Grading/Excavation		3	15.0	1.2	3
Fugitive Dust - Drainage/Utilities/Subgrade	0	3	0.0	0.0	0

Off road equipment default number of vehicles can be overridden in cells B115 through B224.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
0	1	Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
0	1	Scrapper	0.00	0.00	0.00	0.00
0	11	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0

Grading/Excavation Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
1		Bore/Drill Rigs	2.87	7.47	5.75	0.43
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
1	0	Cranes	1.44	6.59	6.16	0.34
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
6		Dozer	21.77	103.21	129.30	6.69
6	1	Excavator	11.04	38.02	38.81	2.05
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
4	1	Grader	4.79	22.56	38.92	2.12
1	1	Loaders, Rubber Tired	0.92	4.50	7.01	0.38
1		Off-Highway Trucks	3.60	13.62	13.98	0.72
4	0	Other Construction Equip.	8.32	41.28	37.70	2.08
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
4		Rollers	2.35	11.48	17.87	0.97
10	1	Scrapper	36.42	166.32	159.65	8.50
0	11	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	93.5	415.1	455.1	24.3
		tons per period	10.3	45.7	50.1	2.7

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
0	1	Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
0	1	Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
0	1	Scrapper	0.00	0.00	0.00	0.00
0	11	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
0	1	Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0

Paving Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
0	1	Pavers	0.00	0.00	0.00	0.00
0	1	Paving Equipment	0.00	0.00	0.00	0.00
0	2	Rollers	0.00	0.00	0.00	0.00
		Scrapper	0.00	0.00	0.00	0.00
0	11	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0
Total Emissions (tons per construction period)			10.3	45.7	50.1	2.7

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Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C235 through C256, E235 through E256, and G235 through G256.

Equipment		Default Values Horsepower		Default Values Load Factor		Default Values Hours/day
Bore/Drill Rigs		218		0.75		8
Concrete/Industrial Saws		84		0.73		8
Cranes		190		0.43		8
Crawler Tractors		143		0.575		8
Crushing/Proc. Equipment		154		0.78		8
Excavators		180		0.58		8
Graders		174		0.575		8
Off-Highway Tractors		255		0.41		8
Off-Highway Trucks		417		0.49		8
Other Construction Equipment		190		0.62		8
Pavers		132		0.59		8
Paving Equipment		111		0.53		8
Rollers		114		0.43		8
Rough Terrain Forklifts		94		0.475		8
Rubber Tired Dozers		352		0.59		8
Rubber Tired Loaders		165		0.465		8
Scrapers		313		0.66		8
Signal Boards		25		0.82		8
Skid Steer Loaders		62		0.515		8
Surfacing Equipment		437		0.49		8
Tractors/Loaders/Backhoes		79		0.465		8
Trenchers		82		0.695		8

Horsepower	Load Factor	Hours/Day	Columns (LxMxN)	Horsepower Class
218	0.75	8.0	1306.0	4
84	0.73	8.0	489.0	2
190	0.43	8.0	655.1	4
143	0.575	8.0	659.6	3
154	0.78	8.0	963.0	3
180	0.58	8.0	835.5	4
174	0.575	8.0	800.3	3
255	0.41	8.0	836.6	4
417	0.49	8.0	1635.4	5
190	0.62	8.0	944.6	4
132	0.59	8.0	620.9	3
111	0.53	8.0	470.4	3
114	0.43	8.0	391.9	3
94	0.475	8.0	358.1	2
352	0.59	8.0	1663.7	5
165	0.465	8.0	615.1	3
313	0.66	8.0	1653.5	5
25	0.82	8.0	164.0	1
62	0.515	8.0	255.4	2
437	0.49	8.0	1712.9	5
79	0.465	8.0	295.7	2
82	0.695	8.0	455.6	2

Default load factors from SCAQMD CEQA Handbook, 1993.
Default horsepower values from Appendix B, California Air Resources Board's Offroad Model (see also Appendix B of this spreadsheet).
Signal board horsepower based on: U.S. EPA, 1998. Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines (EPA420-R-98-016).

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END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 5.2

Emission Estimates for -> Feather River Levee					Exhaust	Fugitive Dust	
Project Phases (English Units)	**ROG (lbs/day)**	**CO (lbs/day)**	**NOx (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	
Grubbing/Land Clearing	0	0	0	0	0	0	
Grading/Excavation	102	504	528	42	27	15	
Drainage/Utilities/Sub-Grade	0	0	2	0	0	0	
Paving	0	0	0	0	0	0	
Maximum (pounds/day)	102	504	528	42	27	15	
Total (tons/construction project)	11.16	53.49	59.67	4.58	2.93	1.65	<-tons

Notes:

Project Start Year ->	2008
Project Length (months) ->	10
Total Project Area (acres) ->	232
Maximum Area Disturbed/Day (acres) ->	3
Total Soil Imported/Exported (yd^3/day)->	18182

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Emission Estimates for -> Feather River Levee					Exhaust	Fugitive Dust	
Project Phases (Metric Units)	**ROG (kgs/day)**	**CO (kgs/day)**	**NOx (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	
Grubbing/Land Clearing	0	0	0	0	0	0	
Grading/Excavation	46	229	240	19	12	7	
Drainage/Utilities/Sub-Grade	0	0	1	0	0	0	
Paving	0	0	0	0	0	0	
Maximum (kilograms/day)	46	229	240	19	12	7	
Total (megagrams/construction project)	10.12	48.52	54.12	4.15	2.66	1.50	<-megagrams

Notes:

Project Start Year ->	2008
Project Length (months) ->	10
Total Project Area (hectares) ->	94
Maximum Area Disturbed/Day (hectares) ->	1
Total Soil Imported/Exported ($meters^3$/day)->	13901

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Road Construction Emissions Model
Data Entry Worksheet

Version 5.2

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a
yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C28.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Input Type

Project Name	Feather River Levee	
Construction Start Year	2009	Enter a Year between 2000 and 2010 inclusive
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	11	months
Predominate Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
On-Road Emission Factors: Enter 1, 2, 3, or 4	4	1. Emfac7fv1.1 4. Emfac2002 (default) 2. Emfac7G 3. Emfac2001
Project Length	6.2	miles
Total Project Area	128	acres
Maximum Area Disturbed/Day	2	acres
Water Trucks Used?	1	1. Yes 2. No
Soil Imported	0	yd^3/day
Soil Exported	22727	yd^3/day
Average Truck Capacity	20	yd^3 (assume 20 if unknown)

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

or User Override (for program calculated

Months	% Time
1.1	10
11.0	40
3.9	35
1.7	15

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C37 through C40.

Construction Periods	User Override of Construction Months	Program Calculated Months	2000	%	2001	%	2002	%	2003	%	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%	2010 adjusted	%	sum	
Grubbing/Land Clearing	0.00	1.10	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
Grading/Excavation	11.00	4.40	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	1.00	0.00	0.00	0.00	1.00	11.00	11
Drainage/Utilities/Sub-Grade	0.00	3.85	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
Paving	0.00	1.65	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0
Totals	11.00	11.00																										

Hauling emission default values can be overridden in cells C48 through C50.

Soil Hauling Emissions

User Input	User Override of Soil Hauling Defaults	Default Values		
Miles/round trip	4	30		4
Round trips/day		1136		1136.35
Vehicle miles traveled/day (calculated)			4545.4	

Hauling Emissions	ROG	NOx	CO	PM10
Emission rate (grams/mile)	0.70	7.99	6.67	0.26
Pounds per day	7.0	80.0	66.8	2.6
Tons per contruction period	0.85	9.68	8.08	0.31

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Worker commute default values can be overridden in cells C62 through C67.

Worker Commute Emissions

	User Override of Worker Commute Default Values	Default Values	
Miles/ one-way trip	10	20	10
One-way trips/day		2	2
No. of employees: Grubbing/Land Clearing	0	18	0
No. of employees: Grading/Excavation	70	21	70
No. of employees: Drainage/Utilities/Sub-Grade	0	21	0
No. of employees: Paving	0	19	0

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	ROG	NOx	CO	PM10
Emission rate (grams/mile)	0.27	0.49	5.66	0.04
Emission rate (grams/trip)	1.49	0.67	14.88	0.02
Pounds per day - Grubbing/Land Clearing	0.0	0.0	0.0	0.0
Tons per const. Period - Grub/Land Clear	0.0	0.0	0.0	0.0
Pounds per day - Grading/Excavation	1.7	1.9	26.6	0.1
Tons per const. Period - Grading/Excavation	0.2	0.2	3.2	0.0
Pounds per day - Drainage/Utilities/Sub-Grade	0.0	0.0	0.0	0.0
Tons per const. Period - Drain/Util/Sub-Grade	0.0	0.0	0.0	0.0
Pounds per day - Paving	0.0	0.0	0.0	0.0
Tons per const. Period - Paving	0.0	0.0	0.0	0.0
tons per construction period	0.2	0.2	3.2	0.0

Water truck default values can be overriden in cells C87 through C89 and E87 through E89.

Water Truck Emissions

	Number of Water Trucks	Program Estimate of Number of Water Trucks	User Override of Water Truck Miles Traveled	Default Values Miles Traveled/Day	
Grubbing/Land Clearing - Exhaust	0	1		40	0
Grading/Excavation - Exhaust	2	1		40	80
Drainage/Utilities/Subgrade	0	1		40	0

	ROG	NOx	CO	PM10
Emission rate (grams/mile)	0.70	7.99	6.67	0.26
Pounds per day - Grubbing/Land Clearing	0.0	0.0	0.0	0.0
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.1	1.4	1.2	0.0
Tons per const. Period - Grading/Excavation	0.01	0.17	0.14	0.01
Pound per day - Drainage/Utilities/Subgrade	0.0	0.0	0.0	0.0
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00

Fugitive dust default values can be overridden in cells C104 and C105.

Fugitive PM10 Dust	User Override of Max Acreage/Day	Default Maximum Acreage/Day	pounds/day	tons/per period	
Fugitive Dust - Grubbing/Land Clearing	0	2	0.0	0.0	0
Fugitive Dust - Grading/Excavation		2	10.0	1.2	3
Fugitive Dust - Drainage/Utilities/Subgrade	0	2	0.0	0.0	0

Off road equipment default number of vehicles can be overridden in cells B115 through B224.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
0	1	Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
0	1	Scrapper	0.00	0.00	0.00	0.00
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0

Grading/Excavation Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
1		Bore/Drill Rigs	2.87	7.47	5.75	0.43
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
1	0	Cranes	1.44	5.64	5.37	0.30
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
6		Dozer	21.84	101.37	116.20	6.13
6	1	Excavator	11.04	28.71	31.08	1.66
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
4	1	Grader	4.79	23.27	36.17	2.00
1	1	Loaders, Rubber Tired	0.92	4.67	6.35	0.35
1		Off-Highway Trucks	3.60	11.49	12.21	0.63
4	0	Other Construction Equip.	8.32	36.37	33.62	1.87
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
4		Rollers	2.35	11.91	16.19	0.90
10	1	Scrapper	36.42	148.42	144.77	7.74
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	93.6	379.3	407.7	22.0
		tons per period	11.3	45.9	49.3	2.7

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
0	1	Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
0	1	Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
0	1	Scrapper	0.00	0.00	0.00	0.00
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
0	1	Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0

Paving	Number of Vehicles		ROG	CO	NOx	PM10
Override of Default Number of Vehicles	*Program-estimate*	Type	pounds/day	pounds/day	pounds/day	pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
0	1	Pavers	0.00	0.00	0.00	0.00
0	1	Paving Equipment	0.00	0.00	0.00	0.00
0	1	Rollers	0.00	0.00	0.00	0.00
		Scrapper	0.00	0.00	0.00	0.00
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0
Total Emissions (tons per construction period)			11.3	45.9	49.3	2.7

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Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C235 through C256, E235 through E256, and G235 through G256.

Equipment		Default Values Horsepower		Default Values Load Factor		Default Values Hours/day
Bore/Drill Rigs		218		0.75		8
Concrete/Industrial Saws		84		0.73		8
Cranes		190		0.43		8
Crawler Tractors		143		0.575		8
Crushing/Proc. Equipment		154		0.78		8
Excavators		180		0.58		8
Graders		174		0.575		8
Off-Highway Tractors		255		0.41		8
Off-Highway Trucks		417		0.49		8
Other Construction Equipment		190		0.62		8
Pavers		132		0.59		8
Paving Equipment		111		0.53		8
Rollers		114		0.43		8
Rough Terrain Forklifts		94		0.475		8
Rubber Tired Dozers		352		0.59		8
Rubber Tired Loaders		165		0.465		8
Scrapers		313		0.66		8
Signal Boards		25		0.82		8
Skid Steer Loaders		62		0.515		8
Surfacing Equipment		437		0.49		8
Tractors/Loaders/Backhoes		79		0.465		8
Trenchers		82		0.695		8

Horsepower	**Load Factor**	**Hours/Day**	**Columns (LxMxN)**	**Horsepower Class**
218	0.75	8.0	1306.0	4
84	0.73	8.0	489.0	2
190	0.43	8.0	655.1	4
143	0.575	8.0	659.6	3
154	0.78	8.0	963.0	3
180	0.58	8.0	835.5	4
174	0.575	8.0	800.3	3
255	0.41	8.0	836.6	4
417	0.49	8.0	1635.4	5
190	0.62	8.0	944.6	4
132	0.59	8.0	620.9	3
111	0.53	8.0	470.4	3
114	0.43	8.0	391.9	3
94	0.475	8.0	358.1	2
352	0.59	8.0	1663.7	5
165	0.465	8.0	615.1	3
313	0.66	8.0	1653.5	5
25	0.82	8.0	164.0	1
62	0.515	8.0	255.4	2
437	0.49	8.0	1712.9	5
79	0.465	8.0	295.7	2
82	0.695	8.0	455.6	2

Default load factors from SCAQMD CEQA Handbook, 1993.

Default horsepower values from Appendix B, California Air Resources Board's Offroad Model (see also Appendix B of this spreadsheet).

Signal board horsepower based on: U.S. EPA, 1998. Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines (EPA420-R-98-016).

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END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 5.2

Emission Estimates for -> Feather River Levee					Exhaust	Fugitive Dust	
Project Phases (English Units)	**ROG (lbs/day)**	**CO (lbs/day)**	**NOx (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	
Grubbing/Land Clearing	0	0	0	0	0	0	
Grading/Excavation	102	474	491	35	25	10	
Drainage/Utilities/Sub-Grade	0	0	1	0	0	0	
Paving	0	0	0	0	0	0	
Maximum (pounds/day)	102	474	491	35	25	10	
Total (tons/construction project)	12.38	55.81	60.64	4.20	2.99	1.21	<-tons

Notes:
Project Start Year -> 2009
Project Length (months) -> 11
Total Project Area (acres) -> 128
Maximum Area Disturbed/Day (acres) -> 2
Total Soil Imported/Exported (yd^3/day)-> 22727

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Emission Estimates for -> Feather River Levee					Exhaust	Fugitive Dust	
Project Phases (Metric Units)	**ROG (kgs/day)**	**CO (kgs/day)**	**NOx (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	
Grubbing/Land Clearing	0	0	0	0	0	0	
Grading/Excavation	47	215	223	16	11	5	
Drainage/Utilities/Sub-Grade	0	0	1	0	0	0	
Paving	0	0	0	0	0	0	
Maximum (kilograms/day)	47	215	223	16	11	5	
Total (megagrams/construction project)	11.23	50.62	55.00	3.81	2.72	1.10	<-megagrams

Notes:
Project Start Year -> 2009
Project Length (months) -> 11
Total Project Area (hectares) -> 52
Maximum Area Disturbed/Day (hectares) -> 1
Total Soil Imported/Exported ($meters^3$/day)-> 17375

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Road Construction Emissions Model
Data Entry Worksheet

Version 5.2

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

Note: Required data input sections have a yellow background.
Optional data input sections have a blue background. Only areas with a yellow or blue background can be modified. Program defaults have a white background.
The user is required to enter information in cells C10 through C28.

To begin a new project, click this button to clear data previously entered. This button will only work if you opted not to disable macros when loading this spreadsheet.

Input Type			or User Override (for program calculated	
			Months	% Time
Project Name	Feather River Levee			
Construction Start Year	2010	Enter a Year between 2000 and 2010 inclusive		
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction		
Project Construction Time	6	months		
Predominate Soil/Site Type: Enter 1, 2, or 3	1	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock		
On-Road Emission Factors: Enter 1, 2, 3, or 4	4	1. Emfac7fv1.1 4. Emfac2002 (default) 2. Emfac7G 3. Emfac2001		
Project Length	6.2	miles		
Total Project Area	128	acres		
Maximum Area Disturbed/Day	2	acres	0.6	10
Water Trucks Used?	1	1. Yes 2. No		
Soil Imported	0	yd^3/day	6.0	40
Soil Exported	22727	yd^3/day	2.1	35
Average Truck Capacity	20	yd^3 (assume 20 if unknown)	0.9	15

The remaining sections of this sheet contain areas that can be modified by the user, although those modifications are optional.

Note: The program's estimates of construction period phase length can be overridden in cells C37 through C40.

Construction Periods	User Override of Construction Months	Program Calculated Months	2000	%	2001	%	2002	%	2003	%	2004	%	2005	%	2006	%	2007	%	2008	%	2009	%	2010	%	2010 adjusted %	sum	
Grubbing/Land Clearing	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
Grading/Excavation	6.00	2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	1.00	1.00	1.00	6
Drainage/Utilities/Sub-Grade	0.00	2.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
Paving	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0
Totals	6.00	6.00																									

Hauling emission default values can be overridden in cells C48 through C50.

Soil Hauling Emissions	User Override of Soil Hauling Defaults	Default Values				
User Input						
Miles/round trip	4	30			4	
Round trips/day		1136			1136.35	4
Vehicle miles traveled/day (calculated)			4545.4			
Hauling Emissions	**ROG**	**NOx**	**CO**	**PM10**		
Emission rate (grams/mile)	0.65	7.23	6.11	0.24		
Pounds per day	6.5	72.4	61.2	2.4		
Tons per contruction period	0.43	4.78	4.04	0.16		

Worker commute default values can be overridden in cells C62 through C67.

Worker Commute Emissions	User Override of Worker Commute Default Values	Default Values				
Miles/ one-way trip	10	20			10	
One-way trips/day		2			2	
No. of employees: Grubbing/Land Clearing	0	18			0	
No. of employees: Grading/Excavation	70	21			70	
No. of employees: Drainage/Utilities/Sub-Grade	0	21			0	
No. of employees: Paving	0	19			0	80
	ROG	**NOx**	**CO**	**PM10**		
Emission rate (grams/mile)	0.24	0.44	5.10	0.04		
Emission rate (grams/trip)	1.37	0.62	13.67	0.02		
Pounds per day - Grubbing/Land Clearing	0.0	0.0	0.0	0.0		
Tons per const. Period - Grub/Land Clear	0.0	0.0	0.0	0.0		
Pounds per day - Grading/Excavation	1.6	1.7	24.2	0.1		
Tons per const. Period - Grading/Excavation	0.1	0.1	1.6	0.0		
Pounds per day - Drainage/Utilities/Sub-Grade	0.0	0.0	0.0	0.0		
Tons per const. Period - Drain/Util/Sub-Grade	0.0	0.0	0.0	0.0		
Pounds per day - Paving	0.0	0.0	0.0	0.0		
Tons per const. Period - Paving	0.0	0.0	0.0	0.0		
tons per construction period	0.1	0.1	1.6	0.0		

Water truck default values can be overriden in cells C87 through C89 and E87 through E89.

Water Truck Emissions	Number of Water Trucks	Program Estimate of Number of Water Trucks	User Override of Water Truck Miles Traveled	Default Values Miles Traveled/Day	
Grubbing/Land Clearing - Exhaust	0	1		40	0
Grading/Excavation - Exhaust	2	1		40	80
Drainage/Utilities/Subgrade	0	1		40	0
	ROG	**NOx**	**CO**	**PM10**	
Emission rate (grams/mile)	0.65	7.23	6.11	0.24	
Pounds per day - Grubbing/Land Clearing	0.0	0.0	0.0	0.0	
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	
Pound per day - Grading/Excavation	0.1	1.3	1.1	0.0	
Tons per const. Period - Grading/Excavation	0.01	0.08	0.07	0.00	
Pound per day - Drainage/Utilities/Subgrade	0.0	0.0	0.0	0.0	
Tons per const. Period - Drainage/Utilities/Subgrade	0.00	0.00	0.00	0.00	

Fugitive dust default values can be overridden in cells C104 and C105.

Fugitive PM10 Dust	User Override of Max Acreage/Day	Default Maximum Acreage/Day	pounds/day	tons/per period	
Fugitive Dust - Grubbing/Land Clearing	0	2	0.0	0.0	0
Fugitive Dust - Grading/Excavation		2	10.0	0.7	3
Fugitive Dust - Drainage/Utilities/Subgrade	0	2	0.0	0.0	0

Off road equipment default number of vehicles can be overridden in cells B115 through B224.

Off-Road Equipment Emissions

Grubbing/Land Clearing Override of Default Number of Vehicles	Default Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
0	1	Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
0	1	Scrapper	0.00	0.00	0.00	0.00
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0

Grading/Excavation Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
1		Bore/Drill Rigs	2.87	7.47	5.75	0.43
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
1	0	Cranes	1.44	3.75	4.10	0.22
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
6		Dozer	21.91	99.54	103.11	5.57
6	1	Excavator	11.04	28.71	28.08	1.66
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
4	1	Grader	4.79	23.97	33.42	1.89
1	1	Loaders, Rubber Tired	0.92	5.01	5.17	0.30
1		Off-Highway Trucks	3.60	9.37	10.45	0.54
4	0	Other Construction Equip.	8.32	31.46	29.54	1.66
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
4		Rollers	2.35	12.78	13.17	0.76
10	1	Scrapper	36.42	130.51	129.90	6.98
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	93.7	352.6	362.7	20.0
		tons per period	6.2	23.3	23.9	1.3

Drainage/Utilities/Subgrade Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
0	1	Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
0	1	Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00
0	1	Scrapper	0.00	0.00	0.00	0.00
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
0	1	Trenchers	0.00	0.00	0.00	0.00
		max pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0

Paving Override of Default Number of Vehicles	Number of Vehicles *Program-estimate*	Type	ROG pounds/day	CO pounds/day	NOx pounds/day	PM10 pounds/day
		Backhoes	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00
		Compactor	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00
		Crawler Tractors	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00
		Dozer	0.00	0.00	0.00	0.00
		Excavator	0.00	0.00	0.00	0.00
		Forklifts, Rough Terrain	0.00	0.00	0.00	0.00
		Grader	0.00	0.00	0.00	0.00
		Loaders, Rubber Tired	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00
		Other Construction Equip.	0.00	0.00	0.00	0.00
0	1	Pavers	0.00	0.00	0.00	0.00
0	1	Paving Equipment	0.00	0.00	0.00	0.00
0	1	Rollers	0.00	0.00	0.00	0.00
		Scrapper	0.00	0.00	0.00	0.00
0	12	Signal Boards	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00
		Tractors	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00
		pounds per day	0.0	0.0	0.0	0.0
		tons per period	0.0	0.0	0.0	0.0
Total Emissions (tons per construction period)			6.2	23.3	23.9	1.3

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Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C235 through C256, E235 through E256, and G235 through G256.

Equipment		Default Values Horsepower		Default Values Load Factor		Default Values Hours/day
Bore/Drill Rigs		218		0.75		8
Concrete/Industrial Saws		84		0.73		8
Cranes		190		0.43		8
Crawler Tractors		143		0.575		8
Crushing/Proc. Equipment		154		0.78		8
Excavators		180		0.58		8
Graders		174		0.575		8
Off-Highway Tractors		255		0.41		8
Off-Highway Trucks		417		0.49		8
Other Construction Equipment		190		0.62		8
Pavers		132		0.59		8
Paving Equipment		111		0.53		8
Rollers		114		0.43		8
Rough Terrain Forklifts		94		0.475		8
Rubber Tired Dozers		352		0.59		8
Rubber Tired Loaders		165		0.465		8
Scrapers		313		0.66		8
Signal Boards		25		0.82		8
Skid Steer Loaders		62		0.515		8
Surfacing Equipment		437		0.49		8
Tractors/Loaders/Backhoes		79		0.465		8
Trenchers		82		0.695		8

Horsepower	**Load Factor**	**Hours/Day**	**Columns (LxMxN)**	**Horsepower Class**
218	0.75	8.0	1306.0	4
84	0.73	8.0	489.0	2
190	0.43	8.0	655.1	4
143	0.575	8.0	659.6	3
154	0.78	8.0	963.0	3
180	0.58	8.0	835.5	4
174	0.575	8.0	800.3	3
255	0.41	8.0	836.6	4
417	0.49	8.0	1635.4	5
190	0.62	8.0	944.6	4
132	0.59	8.0	620.9	3
111	0.53	8.0	470.4	3
114	0.43	8.0	391.9	3
94	0.475	8.0	358.1	2
352	0.59	8.0	1663.7	5
165	0.465	8.0	615.1	3
313	0.66	8.0	1653.5	5
25	0.82	8.0	164.0	1
62	0.515	8.0	255.4	2
437	0.49	8.0	1712.9	5
79	0.465	8.0	295.7	2
82	0.695	8.0	455.6	2

Default load factors from SCAQMD CEQA Handbook, 1993.

Default horsepower values from Appendix B, California Air Resources Board's Offroad Model (see also Appendix B of this spreadsheet).

Signal board horsepower based on: U.S. EPA, 1998. Final Regulatory Impact Analysis: Control of Emissions from Nonroad Diesel Engines (EPA420-R-98-016).

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END OF DATA ENTRY SHEET

Road Construction Emissions Model, Version 5.2

Emission Estimates for -> Feather River Levee					Exhaust	Fugitive Dust	
Project Phases (English Units)	**ROG (lbs/day)**	**CO (lbs/day)**	**NOx (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	**PM10 (lbs/day)**	
Grubbing/Land Clearing	0	0	0	0	0	0	
Grading/Excavation	102	439	438	33	23	10	
Drainage/Utilities/Sub-Grade	0	0	1	0	0	0	
Paving	0	0	0	0	0	0	
Maximum (pounds/day)	102	439	438	33	23	10	
Total (tons/construction project)	6.72	28.16	29.57	2.15	1.49	0.66	<-tons

Notes:

Project Start Year ->	2010
Project Length (months) ->	6
Total Project Area (acres) ->	128
Maximum Area Disturbed/Day (acres) ->	2
Total Soil Imported/Exported (yd^3/day)->	22727

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

Emission Estimates for -> Feather River Levee					Exhaust	Fugitive Dust	
Project Phases (Metric Units)	**ROG (kgs/day)**	**CO (kgs/day)**	**NOx (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	**PM10 (kgs/day)**	
Grubbing/Land Clearing	0	0	0	0	0	0	
Grading/Excavation	46	200	199	15	10	5	
Drainage/Utilities/Sub-Grade	0	0	1	0	0	0	
Paving	0	0	0	0	0	0	
Maximum (kilograms/day)	46	200	199	15	10	5	
Total (megagrams/construction project)	6.09	25.54	26.82	1.95	1.35	0.60	<-megagrams

Notes:

Project Start Year ->	2010
Project Length (months) ->	6
Total Project Area (hectares) ->	52
Maximum Area Disturbed/Day (hectares) ->	1
Total Soil Imported/Exported ($meters^3$/day)->	17375

PM10 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns H and I.

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	*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(lbs/VMT)=(k) (sL/2)^.65 (W/3)^1.5 - C	*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, CALIFORNIA (June 2005)	
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			
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(lb/ton)=(k)(0.0032)(U/5)^1.3 /(M/2)^1.4	*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	*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=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	

Conformity: Regionally Significant Thresholds Calculations

2006 Estimated Annual Average Emissions

YUBA COUNTY

ROG	CO	NOX	PM10	
8.48	**44.32**	**7.67**	**7.92**	ton/day
3095.20	16176.8	2799.55	2890.80	tpy
309.52	1617.68	279.96	289.08	10% of total

http://www.arb.ca.gov/app/emsinv/emssumcat_query.php?F_DIV=-4&F_DD=Y&F_YR=2006&F_SEASON=A&SP=2007&F_AREA=CO&F_CO=58

Air Quality Emissions: Indirect Effects

FRLRP Air Quality Emissions, Indirect Effects: Growth-Inducing and Cumulative Assumptions and Emissions Calculations Summary

Growth Inducing: Inundation Area

Assumptions:

Operational Year 2030

242 acres constructed/year over 20 year buildout period (first year of construction 2009)

Residential	12176	du	4059	ac
Commercial	639	ac		
Industrial	0	ac		

Educational	schools	ac/school	students/school	total ac	total students
Elemetary	5	10	700	50	3500
Middle	1.5	20	800	30	1200
High	1.5	40	1000	60	1500

Emissions Summary:	Analysis Year	ROG		NOX		PM10		PM2.5		CO2	
		lb/day	tpy	lb/day	tpy	lb/day	tpy	lb/day	tpy	lb/day	tpy
Construction	**2009**	**5,457**	**59**	**600**	**42**	**1,238**	**15**	**276**	**4**	**130,804**	**9,768**
Operation at buildout	**2030**	**2,420**	**441**	**1,671**	**343**	**6,674**	**1,218**	**1,262**	**230**	**4,414,474**	**773,747**
Mobile Sources		1,447	272	1,394	293	6,672	1,218	1,260	230	4,077,008	712,206
Area Sources		972	168	277	50	2	0	2	0	337,466	61,541
Total (Construction + Operation	**2009-2030**	**7,876**	**500**	**2,271**	**385**	**7,912**	**1,233**	**1,537**	**234**	**4,545,278**	**783,515**

Cumulative: Project Area (Includes Inundation Area)

Assumptions:

Operational Year 2030

418 acres constructed/year over 20 year buildout period (first year of construction 2009)

Residential	23322	du	7774	ac
Commercial	983	ac		
Industrial	205	ac		

Educational	schools	ac/school	students/school	total ac	total students
Elemetary	14	10	700	140	9800
Middle	3.6	20	800	72	2880
High	4.6	40	1000	184	4600

Emissions Summary:	Analysis Year	ROG		NOX		PM10		PM2.5		CO2	
		lb/day	tpy	lb/day	tpy	lb/day	tpy	lb/day	tpy	lb/day	tpy
Construction	**2009**	**9,419**	**102**	**982**	**70**	**2,135**	**26**	**473**	**7**	**223,167**	**16,692**
Operation at buildout	**2030**	**4,294**	**778**	**2,804**	**575**	**11,084**	**2,022**	**2,096**	**382**	**7,370,534**	**1,292,148**
Mobile Sources		2,439	456	2,315	487	11,080	2,022	2,092	382	6,773,209	1,183,224
Area Sources		1,855	321	490	88	4	0	4	0	597,325.83	108,924
Total (Construction + Operation	**2009-2030**	**13,713**	**880**	**3,786**	**645**	**13,219**	**2,049**	**2,569**	**390**	**7,593,702**	**1,308,840**

Difference: (Cumulative - Growth Inducing)

(Emissions that would occur without the project)

Assumptions:

Operational Year 2030

176 acres constructed/year over 20 year buildout period (first year of construction 2009)

Residential	11146	du	3715	ac
Commercial	344	ac		
Industrial	205	ac		

Educational	schools	ac/school	students/school	total ac	total students
Elemetary	9	10	700	90	6300
Middle	2.1	20	800	42	1680
High	3.1	40	1000	124	3100

Emissions Summary:	Analysis Year	ROG		NOX		PM10		PM2.5		CO2	
		lb/day	tpy	lb/day	tpy	lb/day	tpy	lb/day	tpy	lb/day	tpy
Construction	**2009**	**3,963**	**43**	**382**	**28**	**897**	**11**	**197**	**3**	**92,363**	**6,924**
Operation at buildout	**2030**	**1,874**	**337**	**1,133**	**232**	**4,409**	**805**	**834**	**152**	**2,956,061**	**518,401**
Mobile Sources		992	184	920	194	4,408	804	832	152	2,696,201	471,018
Area Sources		882	153	213	38	2	0	2	0	259,860	47,383
Total (Construction + Operation	**2009-2030**	**5,837**	**380**	**1,515**	**260**	**5,306**	**816**	**1,031**	**155**	**3,048,424**	**525,325**

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Growth Inducing Construction.urb924

Project Name: FRLRP Growth Inducing Construction

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	5,456.68	599.78	1,214.84	23.47	1,238.31	254.38	21.40	275.78	130,804.49

9/15/2008 3:51:33 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Growth Inducing Construction.urb924

Project Name: FRLRP Growth Inducing Construction

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	59.15	41.52	13.70	1.56	15.26	2.92	1.42	4.34	9,767.90

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Growth Inducing.urb924

Project Name: FRLRP Growth Inducing

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	972.25	276.97	1.96	1.95	337,465.91

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,447.49	1,394.44	6,672.18	1,259.62	4,077,007.81

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,419.74	1,671.41	6,674.14	1,261.57	4,414,473.72

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	PM10	PM2.5	CO2
Natural Gas	20.36	270.74	0.50	0.50	336,579.13
Hearth - No Summer Emissions					
Landscape	98.85	6.23	1.46	1.45	886.78
Consumer Products	595.69				
Architectural Coatings	257.35				
TOTALS (lbs/day, unmitigated)	972.25	276.97	1.96	1.95	337,465.91

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	PM10	PM25	CO2
Single family housing	389.27	355.06	1,708.61	322.95	1,050,328.19
Elementary school	26.30	12.59	60.22	11.37	36,792.54
Junior high school	10.06	5.42	25.93	4.90	15,841.57
High school	11.88	6.50	31.05	5.86	18,935.86
Strip mall	771.17	793.19	3,783.00	713.70	2,303,942.96
General office building	238.81	221.68	1,063.37	200.84	651,166.69
TOTALS (lbs/day, unmitigated)	1,447.49	1,394.44	6,672.18	1,259.62	4,077,007.81

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Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	4,058.67	9.57	dwelling units	12,176.00	116,524.32	996,247.96
Elementary school		1.29	students	3,500.00	4,515.00	35,126.70
Junior high school		1.62	students	1,200.00	1,944.00	15,124.32
High school		1.71	students	1,400.00	2,394.00	18,110.61
Strip mall		42.94	1000 sq ft	6,951.63	298,502.98	2,206,832.49
General office building		11.01	1000 sq ft	6,951.63	76,537.45	620,144.66
					500,417.75	3,891,586.74

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
High school				10.0	5.0	85.0
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Growth Inducing.urb924

Project Name: FRLRP Inducing Growth

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	168.39	50.00	0.22	0.22	61,540.95

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	272.11	293.31	1,217.67	229.87	712,205.67

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	440.50	343.31	1,217.89	230.09	773,746.62

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	PM10	PM2.5	CO2
Natural Gas	3.72	49.41	0.09	0.09	61,425.69
Hearth	0.09	0.03	0.00	0.00	35.45
Landscape	8.90	0.56	0.13	0.13	79.81
Consumer Products	108.71				
Architectural Coatings	46.97				
TOTALS (tons/year, unmitigated)	168.39	50.00	0.22	0.22	61,540.95

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	PM10	PM25	CO2
Single family housing	71.99	74.73	311.82	58.94	183,531.73
Elementary school	4.06	2.65	10.99	2.07	6,427.17
Junior high school	1.60	1.14	4.73	0.89	2,767.31
High school	1.89	1.37	5.67	1.07	3,307.58
Strip mall	148.32	166.78	690.40	130.25	402,409.15
General office building	44.25	46.64	194.06	36.65	113,762.73
TOTALS (tons/year, unmitigated)	272.11	293.31	1,217.67	229.87	712,205.67

9/15/2008 3:36:41 PM

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	4,058.67	9.57	dwelling units	12,176.00	116,524.32	996,247.96
Elementary school		1.29	students	3,500.00	4,515.00	35,126.70
Junior high school		1.62	students	1,200.00	1,944.00	15,124.32
High school		1.71	students	1,400.00	2,394.00	18,110.61
Strip mall		42.94	1000 sq ft	6,951.63	298,502.98	2,206,832.49
General office building		11.01	1000 sq ft	6,951.63	76,537.45	620,144.66
					500,417.75	3,891,586.74

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
High school				10.0	5.0	85.0
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Cumulative Construction.urb924

Project Name: FRLRP Cumulative Construction

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	9,419.48	981.85	2,098.36	36.96	2,135.32	439.39	33.68	473.07	223,167.41

9/15/2008 3:57:00 PM

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Cumulative Construction.urb924

Project Name: FRLRP Cumulative Construction

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

CONSTRUCTION EMISSION ESTIMATES

	ROG	NOx	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (tons/year unmitigated)	101.84	69.73	23.66	2.56	26.22	5.04	2.33	7.36	16,691.96

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\FRLRP Cumulative.urb924

Project Name: FRLRP Cumulative

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	1,854.64	489.57	3.68	3.64	597,325.83

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	2,439.05	2,314.66	11,079.89	2,091.89	6,773,208.52

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	4,293.69	2,804.23	11,083.57	2,095.53	7,370,534.35

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOx	PM10	PM2.5	CO2
Natural Gas	36.04	477.71	0.89	0.88	595,637.33
Hearth - No Summer Emissions					
Landscape	188.90	11.86	2.79	2.76	1,688.50
Consumer Products	1,140.98				
Architectural Coatings	488.72				
TOTALS (lbs/day, unmitigated)	1,854.64	489.57	3.68	3.64	597,325.83

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	PM10	PM25	CO2
Single family housing	745.62	680.09	3,272.68	618.57	2,011,806.35
Elementary school	73.65	35.24	168.63	31.83	103,019.12
Junior high school	23.47	12.64	60.50	11.42	36,963.67
High school	39.03	21.36	102.01	19.25	62,217.84
Strip mall	1,165.20	1,198.48	5,715.95	1,078.37	3,481,160.83
General office building	360.83	334.94	1,606.70	303.46	983,885.45
General light industry	31.25	31.91	153.42	28.99	94,155.26
TOTALS (lbs/day, unmitigated)	2,439.05	2,314.66	11,079.89	2,091.89	6,773,208.52

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Temperature (F): 85 Season: Summer

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	7,774.00	9.57	dwelling units	23,322.00	223,191.53	1,908,220.68
Elementary school		1.29	students	9,800.00	12,642.00	98,354.76
Junior high school		1.62	students	2,800.00	4,536.00	35,290.08
High school		1.71	students	4,600.00	7,866.00	59,506.29

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		42.94	1000 sq ft	10,503.62	451,025.43	3,334,430.99
General office building		11.01	1000 sq ft	10,503.62	115,644.86	937,012.47
General light industry		51.80	acres	205.00	10,619.00	89,465.07
					825,524.82	6,462,280.34

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
High school				10.0	5.0	85.0
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0

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Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\Documents and Settings\phillipsh\Application Data\Urbemis\Version9a\Projects\ FRLRP Cumulative.urb924

Project Name: FRLRP Cumulative

Project Location: Feather River AQMD

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	321.32	88.30	0.41	0.41	108,923.69

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	456.18	486.90	2,022.07	381.76	1,183,224.05

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	PM10	PM2.5	CO2
TOTALS (tons/year, unmitigated)	777.50	575.20	2,022.48	382.17	1,292,147.74

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOx	PM10	PM2.5	CO2
Natural Gas	6.58	87.18	0.16	0.16	108,703.81
Hearth	0.32	0.05	0.00	0.00	67.91
Landscape	17.00	1.07	0.25	0.25	151.97
Consumer Products	208.23				
Architectural Coatings	89.19				
TOTALS (tons/year, unmitigated)	321.32	88.30	0.41	0.41	108,923.69

Area Source Changes to Defaults

Percentage of residences with wood stoves changed from 35% to 0%

Percentage of residences with wood fireplaces changed from 10% to 0%

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Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

Source	ROG	NOX	PM10	PM25	CO2
Single family housing	137.89	143.15	597.26	112.89	351,538.02
Elementary school	11.38	7.41	30.77	5.81	17,996.07
Junior high school	3.72	2.66	11.04	2.08	6,457.06
High school	6.22	4.49	18.62	3.51	10,867.76
Strip mall	224.11	251.99	1,043.16	196.80	608,023.28
General office building	66.87	70.48	293.22	55.38	171,890.70
General light industry	5.99	6.72	28.00	5.29	16,451.16
TOTALS (tons/year, unmitigated)	456.18	486.90	2,022.07	381.76	1,183,224.05

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2030 Season: Annual

Emfac: Version : Emfac2007 V2.3 Nov 1 2006

Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Single family housing	7,774.00	9.57	dwelling units	23,322.00	223,191.53	1,908,220.68
Elementary school		1.29	students	9,800.00	12,642.00	98,354.76
Junior high school		1.62	students	2,800.00	4,536.00	35,290.08
High school		1.71	students	4,600.00	7,866.00	59,506.29

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Summary of Land Uses

Land Use Type	Acreage	Trip Rate	Unit Type	No. Units	Total Trips	Total VMT
Strip mall		42.94	1000 sq ft	10,503.62	451,025.43	3,334,430.99
General office building		11.01	1000 sq ft	10,503.62	115,644.86	937,012.47
General light industry		51.80	acres	205.00	10,619.00	89,465.07
					825,524.82	6,462,280.34

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	39.9	0.0	100.0	0.0
Light Truck < 3750 lbs	19.1	0.0	99.0	1.0
Light Truck 3751-5750 lbs	19.7	0.0	100.0	0.0
Med Truck 5751-8500 lbs	9.3	0.0	100.0	0.0
Lite-Heavy Truck 8501-10,000 lbs	2.5	0.0	80.0	20.0
Lite-Heavy Truck 10,001-14,000 lbs	0.9	0.0	55.6	44.4
Med-Heavy Truck 14,001-33,000 lbs	1.6	0.0	18.8	81.2
Heavy-Heavy Truck 33,001-60,000 lbs	1.6	0.0	0.0	100.0
Other Bus	0.1	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	0.0
Motorcycle	4.0	32.5	67.5	0.0
School Bus	0.1	0.0	0.0	100.0
Motor Home	1.2	0.0	91.7	8.3

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Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	10.8	7.3	7.5	9.5	7.4	7.4
Rural Trip Length (miles)	16.8	7.1	7.9	14.7	6.6	6.6
Trip speeds (mph)	35.0	35.0	35.0	35.0	35.0	35.0
% of Trips - Residential	32.9	18.0	49.1			
% of Trips - Commercial (by land use)						
Elementary school				20.0	10.0	70.0
Junior high school				20.0	10.0	70.0
High school				10.0	5.0	85.0
Strip mall				2.0	1.0	97.0
General office building				35.0	17.5	47.5
General light industry				50.0	25.0	25.0