

**Pease-Marysville Transmission Line Project
Criteria Pollutant and GHG Emissions**

Activity	Days	Worker Crews	Pollutant (lb/day)					Greenhouse Gases	
			ROG	NOx	CO	SOx	PM10	lb/day CO ₂ E	MT/yr CO ₂ E
Site Preparation - Steel Poles									
Fugitive Dust	25		—	—	—	—	2.87	—	—
Backhoe	25		0.17	1.17	1.61	—	0.06	245.54	2.78
Water Truck	25		0.11	1.39	0.75	—	0.05	162.82	1.85
Worker Commute	25	1	0.03	0.04	0.48	—	0.01	51.62	0.59
Total			0.31	2.61	2.84	—	2.99	459.97	5.22
Site Preparation - Wood Poles									
Fugitive Dust	12		—	—	—	—	8.60	—	—
Backhoe	12		0.17	1.17	1.61	—	0.06	245.54	1.34
Water Truck	12		0.11	1.39	0.75	—	0.05	162.82	0.89
Worker Commute	12	1	0.03	0.04	0.48	—	0.01	51.62	0.28
Total			0.31	2.61	2.84	—	8.72	459.97	2.50
Pole Installation - Steel Poles									
Drill Rig	25		0.62	8.01	2.23	—	0.25	1,231.31	13.96
Crane	25		0.62	6.12	2.38	—	0.24	554.73	6.29
Cement Mixer	25		0.02	0.11	0.08	—	0.01	12.17	0.14
Worker Commute	25	1	0.03	0.04	0.48	—	0.00	51.62	0.59
Total			1.29	14.27	5.17	—	0.50	1,849.82	20.98
Pole Installation - Wood Poles									
Line Trucks	135		0.16	2.09	1.13	—	0.08	244.22	14.96
Worker Commute	135	1	0.03	0.04	0.48	—	0.00	51.62	3.16
Total			0.19	2.13	1.60	—	0.09	295.84	18.12
Conductor and Framing									
Line Trucks	160		0.16	2.09	1.13	—	0.08	244.22	17.72
Worker Commute	160	1	0.03	0.04	0.48	—	0.00	51.62	3.75
Total			0.19	2.13	1.60	—	0.09	295.84	21.47
Maximum Daily Emissions			1.48	16.41	6.77	—	8.72	2,145.66	
Annual GHG Emissions (9 months)									68.28
Annual GHG Emissions (12 months)									91.04

Note: All emissions were calculated using the SMAQMD Road Construction Emissions Model.

Road Construction Emissions Model, Version 6.3.1

Emission Estimates for -> Pease-Marysville Trans. Line											
Project Phases (English Units)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	CO2 (lbs/day)	
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-	
Grading/Excavation	0.5	4.0	4.7	5.9	0.2	5.7	1.4	0.2	1.2	701.6	
Drainage/Utilities/Sub-Grade	1.4	5.9	15.7	6.3	0.6	5.7	1.7	0.5	1.2	2,010.1	
Paving	-	-	-	-	-	-	-	-	-	-	
Maximum (pounds/day)	1.4	5.9	15.7	6.3	0.6	5.7	1.7	0.5	1.2	2,010.1	
Total (tons/construction project)	0.1	0.5	1.3	0.5	0.0	0.4	0.1	0.0	0.1	174.5	

Notes: Project Start Year -> 2009
 Project Length (months) -> 9
 Total Project Area (acres) -> 9
 Maximum Area Disturbed/Day (acres) -> 1
 Total Soil Imported/Exported (yd³/day)-> 0

PM10 and PM2.5 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. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

Emission Estimates for -> Pease-Marysville Trans. Line											
Project Phases (Metric Units)	ROG (kgs/day)	CO (kgs/day)	NOx (kgs/day)	Total PM10 (kgs/day)	Exhaust PM10 (kgs/day)	Fugitive Dust PM10 (kgs/day)	Total PM2.5 (kgs/day)	Exhaust PM2.5 (kgs/day)	Fugitive Dust PM2.5 (kgs/day)	CO2 (kgs/day)	
Grubbing/Land Clearing	-	-	-	-	-	-	-	-	-	-	
Grading/Excavation	0.2	1.8	2.1	2.7	0.1	2.6	0.6	0.1	0.5	318.9	
Drainage/Utilities/Sub-Grade	0.6	2.7	7.1	2.8	0.3	2.6	0.8	0.2	0.5	913.7	
Paving	-	-	-	-	-	-	-	-	-	-	
Maximum (kilograms/day)	0.6	2.7	7.1	2.8	0.3	2.6	0.8	0.2	0.5	913.7	
Total (megagrams/construction project)	0.1	0.5	1.2	0.4	0.0	0.4	0.1	0.0	0.1	158.3	

Notes: Project Start Year -> 2009
 Project Length (months) -> 9
 Total Project Area (hectares) -> 4
 Maximum Area Disturbed/Day (hectares) -> 0
 Total Soil Imported/Exported (meters³/day)-> 0

PM10 and PM2.5 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. Total PM2.5 emissions shown in Column J are the sum of exhaust and fugitive dust emissions shown in columns K and L.

**Road Construction Emissions Model
Data Entry Worksheet**

Version 6.3.1

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 C25.

Input Type

Project Name	Pease-Marysville Trans. Line	
Construction Start Year	2009	Enter a Year between 2005 and 2025 (inclusive)
Project Type	1	1 New Road Construction 2 Road Widening 3 Bridge/Overpass Construction
Project Construction Time	9.0	months
Predominant Soil/Site Type: Enter 1, 2, or 3	2	1. Sand Gravel 2. Weathered Rock-Earth 3. Blasted Rock
Project Length	8.3	miles
Total Project Area	8.9	acres
Maximum Area Disturbed/Day	0.9	acres
Water Trucks Used?	1	1. Yes No
Soil Imported	0.0	yd ³ /day
Soil Exported	0.0	yd ³ /day
Average Truck Capacity	20.0	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.

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 C34 through C37.

Construction Periods	User Override of	
	Construction Months	Program Calculated Months
Grubbing/Land Clearing	0.00	0.90
Grading/Excavation	1.70	4.05
Drainage/Utilities/Sub-Grade	7.30	2.70
Paving	0.00	1.35
Totals	9.00	9.00

Hauling emission default values can be overridden in cells C45 through C46.

Soil Hauling Emissions		User Override of				
User Input	Soil Hauling Defaults	Default Values				
Miles/round trip			30			
Round trips/day	2.00		0			
Vehicle miles traveled/day (calculated)			60			
Hauling Emissions	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate (grams/mile)	1.19	15.82	8.52	0.62	0.53	1847.96
Emission rate (grams/trip)	12.14	8.36	214.37	0.02	0.01	229.92
Pounds per day	0.2	2.1	1.1	0.1	0.1	244.2
Tons per construction period	0.00	0.04	0.02	0.00	0.00	4.57

Worker commute default values can be overridden in cells C60 through C65.

Worker Commute Emissions		User Override of Worker				
	Commute Default Values	Default Values				
Miles/ one-way trip			20			
One-way trips/day			2			
No. of employees: Grubbing/Land Clearing			1			
No. of employees: Grading/Excavation	10.00		3			
No. of employees: Drainage/Utilities/Sub-Grade	10.00		3			
No. of employees: Paving			4			
	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grading/Excavation (grams/mile)	0.195	0.332	3.340	0.034	0.019	426.170
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	0.195	0.332	3.340	0.021	0.019	426.170
Emission rate - Paving (grams/mile)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grubbing/Land Clearing (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Emission rate - Grading/Excavation (grams/trip)	1.048	0.435	10.085	0.120	0.011	190.980
Emission rate - Draining/Utilities/Sub-Grade (gr/trip)	1.048	0.435	10.085	0.120	0.011	190.980
Emission rate - Paving (grams/trip)	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grubbing/Land Clearing	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Grub/Land Clear	0.000	0.000	0.000	0.000	0.000	0.000
Pounds per day - Grading/Excavation	0.033	0.041	0.479	0.005	0.002	49.038
Tons per const. Period - Grading/Excavation	0.001	0.001	0.009	0.000	0.000	0.917
Pounds per day - Drainage/Utilities/Sub-Grade	0.033	0.041	0.479	0.004	0.002	49.038
Tons per const. Period - Drain/Util/Sub-Grade	0.003	0.003	0.038	0.000	0.000	3.938
Pounds per day - Paving	0.000	0.000	0.000	0.000	0.000	0.000
Tons per const. Period - Paving	0.000	0.000	0.000	0.000	0.000	0.000
tons per construction period	0.003	0.004	0.047	0.000	0.000	4.855

Water truck default values can be overridden in cells C91 through C93 and E91 through E93.

Water Truck Emissions	User Override of	Program Estimate of	User Override of Truck	Default Values		
	Default # Water Trucks	Number of Water Trucks	Miles Traveled/Day	Miles Traveled/Day		
Grubbing/Land Clearing - Exhaust	0.00	1		40		
Grading/Excavation - Exhaust		1		40		
Drainage/Utilities/Subgrade		1		40		
	ROG	NOx	CO	PM10	PM2.5	CO2
Emission rate - Grubbing/Land Clearing (grams/mile)	0.00	0.00	0.00	0.00	0.00	0.00
Emission rate - Grading/Excavation (grams/mile)	1.19	15.82	8.52	0.62	0.53	1847.96
Emission rate - Draining/Utilities/Sub-Grade (gr/mile)	1.19	15.82	8.52	0.62	0.53	1847.96
Pounds per day - Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00
Tons per const. Period - Grub/Land Clear	0.00	0.00	0.00	0.00	0.00	0.00
Pound per day - Grading/Excavation	0.11	1.39	0.75	0.05	0.05	162.82
Tons per const. Period - Grading/Excavation	0.00	0.03	0.01	0.00	0.00	3.04
Pound per day - Drainage/Utilities/Subgrade	0.10	1.39	0.75	0.05	0.05	162.82
Tons per const. Period - Drainage/Utilities/Subgrade	0.01	0.11	0.06	0.00	0.00	13.07

Fugitive dust default values can be overridden in cells C110 through C112.

Fugitive Dust	User Override of Max	Default	PM10	PM10	PM2.5	PM2.5
	Acreage Disturbed/Day	Maximum Acreage/Day	pounds/day	tons/per period	pounds/day	tons/per period
Fugitive Dust - Grubbing/Land Clearing		0	0.0	0.0	0.0	0.0
Fugitive Dust - Grading/Excavation		0.86	8.6	0.4	1.8	0.1
Fugitive Dust - Drainage/Utilities/Subgrade		0.86	8.6	0.3	1.8	0.1

Grading/Excavation	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Type						
Override of Default Number of Vehicles	Program-estimate	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		0 Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
0.00		0 Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Pavers	0.00	0.00	0.00	0.00	0.00	0.00
		Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
		Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00		17 Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
1.00		Tractors/Loaders/Backhoes	0.17	1.61	1.17	0.06	0.06	245.54
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Grading/Excavation	pounds per day	0.2	1.6	1.2	0.1	0.1	245.5
	Grading	tons per phase	0.0	0.0	0.0	0.0	0.0	4.6

Drainage/Utilities/Subgrade	Default		ROG	CO	NOx	PM10	PM2.5	CO2		
	Number of Vehicles	Program-estimate								
Override of Default Number of Vehicles			pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day		
			Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00	
			Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00	
	1.00		Bore/Drill Rigs	0.62	2.23	8.01	0.25	0.23	1231.31	
	1.00		Cement and Mortar Mixers	0.02	0.08	0.11	0.01	0.01	12.17	
			Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00	
	1.00		Cranes	0.62	2.38	6.12	0.24	0.22	554.73	
			Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
			Excavators	0.00	0.00	0.00	0.00	0.00	0.00	
			Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	
			Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	1	Graders	0.00	0.00	0.00	0.00	0.00	0.00	
			Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00	
			Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00	
			Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
			Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
			Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
			Pavers	0.00	0.00	0.00	0.00	0.00	0.00	
			Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	1	Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00	
			Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00	
			Pumps	0.00	0.00	0.00	0.00	0.00	0.00	
			Rollers	0.00	0.00	0.00	0.00	0.00	0.00	
			Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00	
			Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00	
			Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	1	Scrapers	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	17	Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00	
			Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00	
			Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00	
			Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00	
			Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00	
	0.00	1	Trenchers	0.00	0.00	0.00	0.00	0.00	0.00	
			Welders	0.00	0.00	0.00	0.00	0.00	0.00	
			Drainage	pounds per day	1.3	4.7	14.2	0.5	0.5	1798.2
			Drainage	tons per phase	0.1	0.4	1.1	0.0	0.0	144.4

Paving	Default		ROG	CO	NOx	PM10	PM2.5	CO2
	Number of Vehicles	Type						
Override of Default Number of Vehicles	Program-estimate	Type	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day	pounds/day
		Aerial Lifts	0.00	0.00	0.00	0.00	0.00	0.00
		Air Compressors	0.00	0.00	0.00	0.00	0.00	0.00
		Bore/Drill Rigs	0.00	0.00	0.00	0.00	0.00	0.00
		Cement and Mortar Mixers	0.00	0.00	0.00	0.00	0.00	0.00
		Concrete/Industrial Saws	0.00	0.00	0.00	0.00	0.00	0.00
		Cranes	0.00	0.00	0.00	0.00	0.00	0.00
		Crushing/Proc. Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Excavators	0.00	0.00	0.00	0.00	0.00	0.00
		Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Generator Sets	0.00	0.00	0.00	0.00	0.00	0.00
		Graders	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Tractors	0.00	0.00	0.00	0.00	0.00	0.00
		Off-Highway Trucks	0.00	0.00	0.00	0.00	0.00	0.00
		Other Construction Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other General Industrial Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Other Material Handling Equipment	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Pavers	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Paving Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Plate Compactors	0.00	0.00	0.00	0.00	0.00	0.00
		Pressure Washers	0.00	0.00	0.00	0.00	0.00	0.00
		Pumps	0.00	0.00	0.00	0.00	0.00	0.00
0.00		1 Rollers	0.00	0.00	0.00	0.00	0.00	0.00
		Rough Terrain Forklifts	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Dozers	0.00	0.00	0.00	0.00	0.00	0.00
		Rubber Tired Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Scrapers	0.00	0.00	0.00	0.00	0.00	0.00
0.00		17 Signal Boards	0.00	0.00	0.00	0.00	0.00	0.00
		Skid Steer Loaders	0.00	0.00	0.00	0.00	0.00	0.00
		Surfacing Equipment	0.00	0.00	0.00	0.00	0.00	0.00
		Sweepers/Scrubbers	0.00	0.00	0.00	0.00	0.00	0.00
		Tractors/Loaders/Backhoes	0.00	0.00	0.00	0.00	0.00	0.00
		Trenchers	0.00	0.00	0.00	0.00	0.00	0.00
		Welders	0.00	0.00	0.00	0.00	0.00	0.00
	Paving	pounds per day	0.0	0.0	0.0	0.0	0.0	0.0
	Paving	tons per phase	0.0	0.0	0.0	0.0	0.0	0.0
Total Emissions all Phases (tons per construction period) =>			0.1	0.4	1.2	0.0	0.0	149.0

Equipment default values for horsepower, load factor, and hours/day can be overridden in cells C285 through C317, E285 through E317, and G285 through G317.

Equipment	Default Values		Default Values		Default Values	
		Horsepower		Load Factor		Hours/day
Aerial Lifts		60		0.46		8
Air Compressors		106		0.48		8
Bore/Drill Rigs		291		0.75	6.00	8
Cement and Mortar Mixers		10		0.56	3.00	8
Concrete/Industrial Saws		19		0.73		8
Cranes		399		0.43	6.00	8
Crushing/Proc. Equipment		142		0.78		8
Excavators		168		0.57		8
Forklifts		145		0.30		8
Generator Sets		549		0.74		8
Graders		174		0.61		8
Off-Highway Tractors		267		0.65		8
Off-Highway Trucks		479		0.57		8
Other Construction Equipment		75		0.62		8
Other General Industrial Equipment		238		0.51		8
Other Material Handling Equipment		191		0.59		8
Pavers		100		0.62		8
Paving Equipment		104		0.53		8
Plate Compactors		8		0.43		8
Pressure Washers		1		0.60		8
Pumps		53		0.74		8
Rollers		95		0.56		8
Rough Terrain Forklifts		93		0.60		8
Rubber Tired Dozers		357		0.59		8
Rubber Tired Loaders		157		0.54		8
Scrapers		313		0.72		8
Signal Boards		20		0.78		8
Skid Steer Loaders		44		0.55		8
Surfacing Equipment		362		0.45		8
Sweepers/Scrubbers		91		0.68		8
Tractors/Loaders/Backhoes		108		0.55	6.00	8
Trenchers		63		0.75		8
Welders		45		0.45		8