Appendix D: Air Quality Data

D-1: Emissions Calculation Methodology

Air Pollutant Emissions Methodology and Calculations

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SECTION 1: INTRODUCTION

1.1 - Analysis Tools

This analysis used the following tools that perform project-level air quality assessments. These tools included:

- The California Air Resources Board (ARB) EMFAC2007 model emission rates for on-road mobile sources
- The ARB OFFROAD2007 model emission rates for off-road mobile sources
- The ARB-Approved URBEMIS2007 v.9.2.4 land use model for construction employee-trip, on-road hauling, grading, and earth-disturbing PM_{10} emissions, as well as operational employee-trip emissions.

The above models and their assumptions are described in subsequent sections of this appendix.

1.2 - Considerations

Construction emission can vary substantially from day to day, depending on the level of activity, the specific type of activity, and the prevailing weather conditions. The methodology developed for the purposes of quantitative air quality analysis was based on information available at the time of analysis; actual equipment and activity intensity at the time of construction may vary from that analyzed in this document. However, a methodology must be developed to provide CEQA-appropriate emissions analysis.

There were two main considerations for development of the methodology for this air quality analysis. The first consideration was the linear nature of the Project's construction. Each pipeline's construction results in the following:

- Many construction activities will be occurring concurrently, as multiple crews move down the pipeline completing their respective tasks in assembly-line fashion; and,
- Non-concurrent completion of Horizontal Directional Drilling (HDD) and Jack and Bore crossings, as construction crews will address these crossings in a sequential fashion.

The second consideration was the regional air pollutant thresholds recommended by the four air districts. Although differing in quantity, all four air district's regional thresholds are in units of a pounds per day (lbs/day) – not in total tons per year. Therefore, the analysis includes emissions estimates from all phases of the project's construction, and determines the maximum daily emissions that may occur.

1.3 - Applicant Proposed Measures/Regulatory Compliance

Implementation of Applicant Proposed Measures (APMs) and compliance with required regulations are included in the emissions analysis as the 'unmitigated' Project emissions. The measures that are incorporated into the Project that reduce air quality impacts are discussed below:

APM AQ-1. PG&E will compile a comprehensive inventory list (i.e., make, model, engine year, horsepower, emission rates) of all heavy-duty off-road (portable and mobile) equipment having 50 horsepower or greater that will be used an aggregate of 40 or more hours for construction and apply the following mitigation measure: The contractor shall provide a plan demonstrating that the heavy-duty (equal to or greater than 50 horsepower) off-road equipment to be used in the construction project will achieve a project-wide fleet-average 20 percent NOX reduction and 45 percent particulate reduction compared to the most recent ARB fleet average at time of construction.

APM AQ-2. PG&E will ensure that construction equipment exhaust emissions will not exceed Visible Emission limitations (40 percent opacity or Ringelmann 2.0). Operators of vehicles and equipment found to exceed opacity limits will take action to repair the equipment within 72 hours or remove the equipment from service. Failure to comply may result in a Notice of Violation.

APM AQ-3. PG&E will prepare and implement a fugitive dust mitigation plan.

APM AQ-4. The primary contractor will be responsible to ensure that all construction equipment is properly tuned and maintained.

APM AQ-5. PG&E will minimize equipment and vehicle idling time to five minutes.

APM AQ-6. PG&E will ensure that an operational water truck will be on-site at all times, and will apply water to control dust three times daily, or as needed, to prevent dust impacts off-site.

APM AQ-7. PG&E will utilize existing power sources (e.g., available electric power) or clean fuel generators, rather than temporary power generators.

APM AQ-8. PG&E will develop a traffic plan to minimize traffic flow interference from construction activities, as appropriate.

APM AQ-9. PG&E will not allow open burning of removed vegetation.

APM AQ-10. PG&E will ensure that all portable engines and portable engine-driven equipment units used at the project work site, with the exception of on-road and off-road motor

vehicles, comply with ARB Portable Equipment Registration with the State or a local district permit.

APM AQ-11. Contractors will limit operation on "spare the air" days within each County.

1.3.1 - Impact of Measures on Potential Emissions.

Off-road vehicle exhaust emissions will be reduced through implementation of APM AQ-1, APM AQ-2, APM AQ-4, APM AQ-5, APM AQ-7 and APM AQ-10.

Fugitive dust emissions will be reduced through implementation of APM AQ-3 and APM AQ-6.

Measure APM AQ-8 reduces potential idling emissions resulting from traffic impacts on nearby roadways.

Measure APM AQ-9 eliminates burning vegetation as a potential emissions source.

Measure APM AQ-11 reduces the Project's contribution to ambient air pollution on Spare the Air days – days where ozone concentrations are categorized as 'unhealthy' or worse on the Air Quality Index during the ozone season of May through October.

1.3.2 - Inclusion of Measures in Analysis

Of the measures discussed above, only two have readily quantifiable emissions reductions. The emissions reductions from APM AQ-1 are quantifiable, and were applied as an off-model calculation. Implementation of APM AQ-6 is included in the emissions analysis as an unmitigated control measure in the URBEMIS model. When reviewing the URBEMIS printouts in the appendixes, please note that the URBEMIS output identifies any measure that reduces emissions as "mitigation" regardless if the measure fulfills a requirement or is considered mitigation by CEQA standards.

SECTION 2: CONSTRUCTION METHODOLOGY

2.1 - Base Information

The main construction activities that generate air pollutant emissions are identified in Table 1. The methodology for each construction activity is addressed in the following subsections. Table 2 contains the estimated construction timeline for each pipeline route. Construction of Line 406 is estimated to take 7 months. Line 407W, 407E and the DFM are each expected to be constructed within 6 months.

Table 1: Construction Activities

Activity	Air Pollutant Sources
Grading	Equipment Exhaust, Dust Generation
Trenching	Equipment Exhaust, Dust Generation
Horizontal Directional Drilling (HDD)	Equipment Exhaust, Dust Generation
Jack and Bore	Equipment Exhaust, Dust Generation
Soil Hauling	Vehicle Exhaust, Entrained Road Dust, Dust from soils transport
Pipe Hauling	Vehicle Exhaust, Entrained Road Dust
Construction Employee Trips	Vehicle Exhaust, Entrained Road Dust
Soil Decompaction	Vehicle Exhaust, Dust Generation

Table 2: Construction Timeline by Pipeline and Air District.

Air District	Pipe Segment	Construction Timeline
YSAQMD	406	September/October 2009 – February 2010
	407W (p)	May 2012 - Sept 2012
FRAQMD	407 W (p)	May 2012 - Sept 2012
	DFM (p)	May 2010 - Sept 2010
	407E (p)	May 2010 - Sept 2010
PCAPCD	407E (p)	May 2010 - Sept 2010
SMAQMD	DFM (p)	May 2010 - Sept 2010

PG&E provided the estimated fleet mix for the three main construction activities for the pipeline: Trenching, HDD and Jack and Bore. Because of the equipment naming convention in URBEMIS, assumptions were made regarding the type of equipment to be modeled as compared to the equipment list provided by PG&E.

The URBEMIS program was used to estimate dust generation, employee trips and exhaust emissions from a water truck, consistent with APM AQ-6. In addition, the soil hauling trips and pipe hauling trips, as discussed below, were incorporated in the URBEMIS run for each pipeline.

2.1.1 - Grading

Per information provided by PG&E, the majority of the Right of Way (ROW) is suitable for construction without grading. However, approximately 30.6 acres of the Dunnigan Hills area (Line 406 in YSAQMD) will require grading. Grading emissions were estimated using URBEMIS v9.2.4 default grading assumptions for 30.6 acres to be disturbed, with one fourth of the total acreage the maximum acreage that may be disturbed on any one day.

2.1.2 - Trenching

Equipment Exhaust Emissions

The estimated construction fleet for trenching was provided by PG&E. Off-road vehicle emission calculated using the EMFAC2007 emission factors, as presented in URBEMIS v9.2.4 for the year of construction activities, the construction equipment mix, and the estimated hours of equipment use day of trenching. URBEMIS contains exhaust emission factors in discrete horsepower ranges for each type of equipment. Therefore, the analysis used emission factors for the closest horsepower range for each piece of equipment. The trenching equipment mix analyzed is listed in Table 3 below. It was assumed that all 18-day crews would operate concurrently.

Table 3: Trenching Equipment

URBEMIS Equivalent	Quantity	Peak Hours/Day	Horsepower	Horsepower Range*
Environmental, Fence & Pothole Crew (60 Days)				
Pump	1	9	325	250
Off-Highway Truck	1	9	230	250
Grade Crew (18 Days)				
Crawler Tractor	3	8	265	250
Tractors/Loaders/Backhoes	1	8	250	250
Grader	1	8	295	250
Ditch Crew (18 Days)				
Tractors/Loaders/Backhoes	5	8	250	250
Trencher	1	8	200	250
Stringing Crew (18 days)				
Tractors/Loaders/Backhoes	1	8	250	250
Other Material Handling Equipment	1	8	310	250
Other Material Handling Equipment	4	8	425	500
Crawler Tractor	1	8	265	250

URBEMIS Equivalent	Quantity	Peak Hours/Day	Horsepower	Horsepower Range*
Bending Crew (18 days)				
Other Material Handling Equipment	2	8	310	250
Other Material Handling Equipment	1	8	110	120
Pipe Gang (Bead Welders) (18 days)				
Other Material Handling Equipment	1	8	310	250
Crawler Tractor	1	8	225	250
Other Material Handling Equipment	1	8	250	250
Off-Highway Truck	1	8	250	250
Welder	8	8	15	15
Joint Coating Crew (18 days)				
Other Material Handling Equipment	1	8	310	250
Air Compressor	1	8	8	15
Lower-In Crew (18 days)				
Other Material Handling Equipment	3	8	310	250
Tractors/Loaders/Backhoes	1	8	250	250
Rubber Tired Dozer	1	8	265	250
Tractors/Loaders/Backhoes	1	8	250	250
Tie-In Crew (30 days)				
Other Material Handling Equipment	3	9	310	250
Tractors/Loaders/Backhoes	1	9	250	250
Rubber Tired Dozer	1	9	265	250
Hydro-Testing Crew (39 days)				
Air Compressor	2	9	10	15
Other Material Handling Equipment	1	9	310	250
Pumps	2	9	8	15
Pumps	1	9	8	15
Clean Up Crew (24 days)				
Rubber Tired Dozer	3	9	265	250
Tractors/Loaders/Backhoes	2	9	250	250
Grader	1	9	300	250
Tractors/Loaders/Backhoes	1	9	150	175
Off-Highway Truck	1	9	350	500

Notes:
* The emission factor for this horsepower range was used.

Dust Generation, Water Truck, Employee Trips, Soil Hauling

As stated above, there will be little grading required for construction of the pipelines, excepting for a portion of the Dunnigan Hills, which is included However, the excavation, stockpiling, and replacement of soils will generate fugitive PM_{10} and $PM_{2.5}$ emissions.

Based on typical area of disturbance, 0.25 acre is assumed that the maximum acreage to be disturbed on any one day. As detailed in the project description of the DEIR, trenches will typically be 8 to 9 feet deep and 4 feet wide. It is reasonable to assume that the approximately 600 cubic yards could be moved on-site on any one day.

2.1.3 - HDD

Equipment Exhaust Emissions

The estimated construction fleet for HDD operations was provided by PG&E. Off-road vehicle emission calculated using the OFFROAD2007 emission factors, the construction equipment mix, and the hours of equipment use per day. The size of the light plants discussed in the project description was used to estimate the diesel generator horsepower. Two 15 horsepower generator are sufficient to generate the required 8,000-watt capacity (2 light stations at 4,000 watts each). The equipment mix used for the HDD emissions estimate is provided in Table 4.

Table 4: HDD Equipment

URBEMIS Equivalent	Quantity	Hours/Day	Horsepower	Horsepower Range*
Bore/Drill Rig	1	10	625	750
Bore/Drill Rig	1	10	400	500
Excavator	1	10	198	250
Off-Highway Truck	1	10	300	250
Crane	1	10	262	250
Generator	2	10	15	15
Other Material Handling Equipment	3	10	310	250

Notes:
* The emission factor for this horsepower range was used.

Dust Generation

The amount of soil excavated per HDD is approximately 446 cubic yards, based on the average HDD length, two sumps and a 42 inch ream. It was assumed that 0.25 acres would be the maximum acreage of disturbance on any one day. The URBEMIS program was used to estimate dust generation, employee trips, and an exhaust emissions from a water truck, consistent with APM AQ-6.

2.1.4 - Jack and Bore

Equipment Exhaust Emissions

The estimated construction fleet for jack and bore construction was provided by PG&E. Off-road vehicle emission calculated using the OFFROAD2007 emission factors, the construction equipment mix, and the hours of equipment use per day of construction.

Table 5: Jack and Bore Equipment

Equipment	Quantity	Hours/Day	Horsepower	Horsepower Range*
Bore/Drill Rig	1	10	120	120
Excavator	1	10	198	250
Other Material Handling Equipment	1	10	310	250
Notes: * The emission factor for this horsepower range was used.				

Dust Generation

Approximately 120 cubic yards will be removed and backfilled per bore. Each bore will take approximately 2 days to complete. It was assumed that 0.25 acres would be the maximum acreage of disturbance on any one day. The URBEMIS program was used to estimate dust generation, employee trips and exhaust emissions from a water truck, consistent with APM AQ-6.

2.1.5 - Soil Hauling

The total number of soil hauling trips per line was provided by PG&E, as well as the average length of trips and number of trips per day. A 'trip' is considered the one-way travel between the origin and the destination ends. A 'round trip' accounts for the trip out from the origin end to the destination end, and then back again to the origin.

The average number of soil hauling trips per day and average length of trips is provided in Table 6, as well as the inputs into the URBEMIS model. The roundtrip length and the number of round trips per day are used to calculate the vehicle miles traveled (VMT). The emissions resulting from soil hauling was generated using the URBEMIS model. The soil-hauling component of URBEMIS is dependant on the volume of soil export and import. Therefore, the volume of soil export and import in the modeling output does not necessarily reflect the actual amount of soil that will be exported.

Table 6: Soil Hauling Trips

Line	Provided by PG&E			URBEMIS Input		
	Total Trips	Average Trip Length*	Number of Trips per Day	Round Trip Length*	Round Trips per Day	Daily VMT
L-406	89	10	2	20	1	20
L-407 E	200	10	5	20	2.5	50

Line	Provided by PG&E			URBEMIS Input		
	Total Trips	Average Trip Length*	Number of Trips per Day	Round Trip Length*	Round Trips per Day	Daily VMT
DFM	45	10	1	20	0.5	10
L-407 W	372	10	5	20	2.5	50
* Miles						

2.1.6 - Pipe Hauling

The total number of pipe hauling trips per line was provided by PG&E, as well as the average length of trips and number of trips per day. The average number trips per day and average length of trips is provided in Table 7. The emissions resulting from pipe hauling was generated using the URBEMIS model. The soil-hauling component of URBEMIS was used to estimate the on-road emissions resulting from pipe hauling. As with soil hauling, the volume of soils export was entered into the model in order to modify the number of round trips per day to reflect the information in Table 6.

Table 7: Pipe Hauling Trips

Line	Provided by PG&E			URBEMIS Input		
	Total Trips	Average Trip Length*	Number of Trips per Day	Round Trip Length*	Round Trips per Day	Daily VMT
L-406	256	30	9	60	4.5	270
L-407 E	254	52	10	104	5	520
DFM	14	52	3	104	1.5	156
L-407 W	307	20	10	40	5	200
Notes: * Miles						

2.1.7 - Construction Employee Trips

As described in the DEIR, there may be between 90 and 130 construction employees working during construction of the pipelines. Construction employee trip emissions were generated using the URBEMIS program. The URBEMIS output incorporates the construction employee trips into the emissions analysis. Therefore, construction employee trips are not specified as a line item in this analysis.

2.1.8 - Paving Emissions

Per information provided by PG&E, approximately 0.14 acre of paving will be replaces as a result of open cut road crossings. The expected paving activities include:

- 5 crossings on L-406

- 11 crossings on L-407 E

Each paving operation will consist of approximately 0.0875 acre of pavement replacement, or approximately 380 square feet of paving per crossing.

2.1.9 - Soils Decompaction

PG&E estimates that it will take approximately 2 hours per acres to decompact soils at the construction sites. Assuming an 8 hour workday, approximately 4 acres may be decompacted in any one day. However, it was assumed that soils decompaction would occur following all other emissions generating activities. An emissions estimate for soils decompaction was not generated, as the equipment activity is far less than during other construction activities and the significance analysis is based on a worst-case day input, as the threshold is a daily rate.

SECTION 3: OPERATIONAL METHODOLOGY

Based on the Project description in the EIR, the Project will likely have up to thirteen inspections/testings per year. PG&E estimates a that maintenance and operational activity will result in approximately 39 round trips per year, at 150 miles traveled per round trip. For the purposes of analyzing the maximum daily operational emissions associated with the Project, it was assumed that trips would be made in a 'Light-Heavy Truck' (8,501 – 10,000 lbs). In addition, it was assumed that operational emissions would begin in 2010.

SECTION 4: EMISSIONS CALCULATIONS

4.1 - Maximum Daily Construction Emissions

Emissions were generated for the main construction activities associated with the Project. Based on the emissions output, the worst-day scenario for each line was developed. The emissions output for Line 406, Line 407-E, Line 407-W, and the DFM are provided below in Table 8, Table 9, Table 10, and Table 11, respectively. Not all construction activity will be occurring concurrently. Of the activities for each pipeline, the Trenching-18 Day Crew, Trenching-Remaining, and Pipe Hauling may occur at the same time. Therefore, the maximum daily emissions would be the summation of Trenching – 18 Day Crew, Trenching – Remaining, and Pipe Hauling emissions.

Construction of Line 406 is expected to begin in 2009 and end in early 2010. The worst-day scenario is applicable to activities occurring in 2009 and 2010. However, because emission factors for on-road and off-road equipment are higher in 2009 than 2010, emissions for construction of Line 406 were only estimated for the 2009 model year. Air pollutant emissions resulting from Line 406 construction activities in 2010 would not be greater than the 2009 modeling estimates.

Table 8: Daily Construction Emissions for Line 406 (2009)

Construction Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Grading – Dunnigan Hills	35.73	4.47	19.71	61.60	14.23
Trenching – Environmental Crew	29.52	2.56	7.40	0.96	—
Trenching – 18 Day Crews	357.82	35.14	101.28	13.43	—
Trenching – Tie-In Crew	16.71	6.15	16.71	2.31	—
Trenching – Hydro Test Crew	4.91	1.72	4.91	0.66	—
Trenching – Clean Up Crew	25.68	9.01	25.68	3.43	—
Trenching – Remaining*	6.31	0.63	2.05	66.50	14.05
Pipe Hauling	9.18	0.71	3.74	0.45	0.39
HDD - Off-Road Emissions	121.13	11.04	33.45	4.22	—
HDD - URBEMIS Output**	5.63	0.58	1.77	49.71	10.52
Paving	12.69	2.16	9.22	1.10	1.01
Jack and Bore - Off-Road Emissions	31.24	3.16	11.29	1.39	—
Jack and Bore - URBEMIS Output**	5.63	0.58	1.77	14.22	3.12
Maximum Daily Emissions	373.31	36.48	107.07	80.38	14.44
YSAQMD Threshold	82	82	NA	150	NA
Exceed Significance Threshold?	Yes	No	No	No	No

Construction Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Notes: * Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling ** Employee Trips, Water Truck Emissions, Fugitive Dust Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions. The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.					

Table 9: Daily Construction Emissions for Line 407-E (2010)

Construction Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Trenching – Environmental Crew	27.90	2.40	6.98	0.89	—
Trenching – 18 Day Crews	338.03	33.37	95.60	12.62	—
Trenching – Tie-In Crew	60.41	5.84	15.83	2.16	—
Trenching – Hydro Test Crew	15.65	1.63	4.69	0.62	—
Trenching – Clean Up Crew	82.12	8.61	24.45	3.24	—
Trenching – URBEMIS Output*	6.70	0.64	2.16	66.51	14.06
Pipe Hauling	15.13	0.99	5.10	0.65	0.56
HDD - Off-Road Emissions	114.79	10.61	32.45	4.02	
HDD - URBEMIS Output**	5.24	0.54	1.67	49.69	10.51
Paving	20.16	2.75	11.56	67.61	15.07
Jack and Bore - Off-Road Emissions	29.16	2.90	10.91	1.26	—
Jack and Bore - URBEMIS Output**	5.24	0.54	1.67	14.22	3.10
Maximum Daily Emissions	359.86	35.00	102.86	79.78	14.62
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	**Yes**	**Yes**	No	No	No
PCAPCD Threshold	82.00	82.00	550.00	82.00	NA
Exceed Significance Threshold?	**Yes**	No	No	No	No
Notes: * Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling ** Employee Trips, Water Truck Emissions, Fugitive Dust Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions. The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.					

Table 10: Daily Construction Emissions for Line 407-W (2012)

Construction Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Trenching – Environmental Crew	23.95	2.08	6.30	0.72	—
Trenching – 18 Day Crews	290.45	29.69	86.04	10.44	—
Trenching – Tie-In Crew	52.21	5.19	14.31	1.79	—
Trenching – Hydro Test Crew	13.59	1.44	4.28	0.51	—
Trenching – Clean Up Crew	71.15	7.81	22.37	2.73	—
Trenching – URBEMIS Output*	5.56	0.57	1.92	66.46	14.02
Pipe Hauling	4.68	0.32	1.62	0.20	0.17
HDD - Off-Road Emissions	94.09	9.42	30.48	3.13	—
HDD - URBEMIS Output**	4.39	0.49	1.52	49.66	10.48
Jack and Bore - Off-Road Emissions	24.58	2.42	10.26	0.98	—
Jack and Bore - URBEMIS Output**	4.39	0.49	1.52	14.18	3.07
Maximum Daily Emissions	300.69	30.58	89.58	77.10	14.19
FRAQMD Threshold	82	82	NA	150	NA
Exceed Significance Threshold?	**Yes**	No	No	No	No
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	**Yes**	**Yes**	No	No	No

Notes:
* Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling
** Employee Trips, Water Truck Emissions, Fugitive Dust
Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions.
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.

Table 11: Daily Construction Emissions for DFM (2010)

Construction Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Trenching – Environmental Crew	27.90	2.40	6.98	0.89	—
Trenching – 18 Day Crews	338.03	33.37	95.60	12.62	—
Trenching – Tie-In Crew	60.41	5.84	15.83	2.16	—
Trenching – Hydro Test Crew	15.65	1.63	4.69	0.62	—
Trenching – Clean Up Crew	82.12	8.61	24.45	3.24	—
Trenching – URBEMIS Output*	5.53	0.56	1.77	66.46	14.02

Construction Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Pipe Hauling	4.54	0.30	1.53	0.20	0.17
Jack and Bore - Off-Road Emissions	29.16	2.90	10.91	1.26	—
Jack and Bore - URBEMIS Output**	5.24	0.54	1.67	14.22	3.10
Maximum Daily Emissions	348.10	34.23	98.90	79.28	14.19
FRAQMD Threshold	25.00	25.00	NA	80.00	NA
Exceed Significance Threshold?	**Yes**	**Yes**	No	No	No
SMAQMD Threshold	85.00	NA	NA	CAAQS/ NAAQS	NA
Exceed Significance Threshold?	**Yes**	No	No	No	No

Notes:
* Employee Trips, Water Truck Emissions, Fugitive Dust Emissions, Soil Hauling
** Employee Trips, Water Truck Emissions, Fugitive Dust
Calculated Off-Road Emissions did not differentiate $PM_{2.5}$ emissions.
The maximum daily emissions refer to the maximum emissions that would occur in one day; it was assumed that the activities do not occur at the same time; therefore, the maximum emissions are not a straight summation of all emissions.

4.2 - Maximum Daily Operational Emissions

The URBEMIS output for operational emissions are presented in Table 12.

Table 12: Daily Operational Emissions (2010)

Activity	Pollutant (lbs/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Maintenance and Operation	0.38	0.08	0.69	0.26	0.05

Notes:
URBEMIS Output

4.3 - Carbon Dioxide Emissions

4.3.1 - Project Construction

Carbon dioxide (CO_2) is the main Greenhouse Gas (GHG) generated during construction. The emission inventory of CO_2 was generated using the estimated construction equipment and activity provided by PG&E. An inventory for each pipeline was generated in total tons of emissions, using the total number of HDD and Jack and Bore Crossings, and the length of pipeline to be trenched and the equipment mix and activity levels provided by PG&E. The Soil Hauling and Pipe Hauling emissions for each pipeline was calculated using the daily activity output from URBEMIS and the

trips lengths and total trips shown in Table 6 and Table 7, respectively. Paving emissions similarly used the URBEMIS output and the known activity for Line 406 and 407-E, as described in section 1.4.8 above. This analysis assumed a 22 working days per month, consistent with the construction assumptions of the URBEMIS model. Emissions from employee trips for the construction of each phase was developed using the known construction length, the assumed construction days per month, and the URBEMIS daily emission rate for employee trips. Table 13 shows the total Project construction GHG generation.

Table 13: All Construction Greenhouse Gas Generation

Year of Construction (Line)	CO_2	
	Total Tons	$MTCO_2e$
2009 (Line 406)	790.33	716.99
2010 (Line 407E)	970.45	880.40
2010 (DFM)	199.85	181.30
2012 (Line 407W)	995.64	903.25
total	2,956.28	2,681.94

Notes:
Emissions converted from tons per year to metric tons of carbon dioxide equivalents ($MTCO_2e$) per year by using the formula: (tons of gas) x (global warming potential) x (0.9072 metric tons)

4.3.2 - Project Operations

Greenhouse gas emissions from Project operations were generated from employee trips as described in the methodology above.

D-2: Off-Road Calculations

Trenching			2009 EF lbs/hp/hr						2010 EF lbs/hp/hr					
Equipment	**Max HP**	**Multiplier**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**
Environmental, Fence & Pot Hole Crew	**(60 days)**													
Pump	250	2164.5	1.69	5.10	20.75	0.02	0.64	576.50	1.57	4.80	19.73	0.02	0.60	2006.79
Off-Highway Truck	250	1179.9	0.87	2.29	8.77	0.01	0.31	842.62	0.83	2.18	8.17	0.01	0.29	842.62
			2.56	*7.40*	*29.52*	*0.03*	*0.96*	*1,419.12*	*2.40*	*6.98*	*27.90*	*0.03*	*0.89*	*2849.41*
Grade Crew (18 Days)														
Crawler Tractor	250	4070.4	4.23	11.86	40.31	0.04	1.63	3,263.84	4.03	11.28	38.19	0.04	1.54	3,263.84
Tractors/Loaders/Backhoes	250	1100	0.66	1.87	7.36	0.01	0.25	758.00	0.63	1.78	6.84	0.01	0.23	758.00
Grader	250	1439.6	1.19	3.32	12.16	0.01	0.45	1,100.23	1.13	3.16	11.45	0.01	0.42	1,100.23
			6.08	*17.05*	*59.83*	*0.06*	*2.33*	*5,122.07*	*5.79*	*16.21*	*56.48*	*0.06*	*2.20*	*5,122.07*
Ditch Crew (18 Days)														
Tractors/Loaders/Backhoes	250	5500	3.31	9.33	36.78	0.05	1.24	3,789.98	3.13	8.90	34.19	0.05	1.15	3,789.98
Trencher	250	1200	1.47	4.33	14.23	0.01	0.59	1,127.60	1.40	4.13	13.56	0.01	0.56	1,127.60
			4.78	*13.66*	*51.01*	*0.06*	*1.83*	*4,917.58*	*4.53*	*13.03*	*47.75*	*0.06*	*1.71*	*4,917.58*
Stringing Crew (18 Days)														
Tractors/Loaders/Backhoes	250	1100	0.66	1.87	7.36	0.01	0.25	758.00	0.63	1.78	6.84	0.01	0.23	758.00
Other Material Handling Equipment	250	1463.2	1.16	3.08	12.50	0.01	0.43	1,081.60	1.10	2.90	11.86	0.01	0.40	1,081.60
Other Material Handling Equipment	500	8024	5.74	19.42	60.75	0.05	2.16	5,931.36	5.46	17.74	57.53	0.05	2.03	5,931.36
Crawler Tractor	250	1356.8	1.41	3.95	13.44	0.01	0.54	1,087.95	1.34	3.76	12.73	0.01	0.51	1,087.95
			8.97	*28.33*	*94.03*	*0.09*	*3.38*	*8,858.91*	*8.53*	*26.19*	*88.95*	*0.09*	*3.18*	*8,858.91*
Bending Crew (18 Days)														
Other Material Handling Equipment	250	2926.4	2.31	6.17	24.99	0.03	0.86	2,163.20	2.19	5.81	23.71	0.03	0.80	2,163.20
Other Material Handling Equipment	120	519.2	0.94	2.88	5.28	0.00	0.50	383.79	0.89	2.85	5.04	0.00	0.48	383.79
			3.25	*9.05*	*30.27*	*0.03*	*1.36*	*2,547.00*	*3.08*	*8.66*	*28.75*	*0.03*	*1.28*	*2,547.00*
Pipe Gang (Bead Welders) (18 Days)														
Other Material Handling Equipment	250	1463.2	1.16	3.08	12.50	0.01	0.43	1,081.60	1.10	2.90	11.86	0.01	0.40	1,081.60
Crawler Tractor	250	1152	1.20	3.36	11.41	0.01	0.46	923.73	1.14	3.19	10.81	0.01	0.44	923.73
Other Material Handling Equipment	250	1180	0.93	2.49	10.08	0.01	0.35	872.26	0.88	2.34	9.56	0.01	0.32	872.26
Off-Highway Truck	250	1140	0.84	2.22	8.47	0.01	0.30	814.13	0.80	2.10	7.89	0.01	0.28	814.13
Welder	15	518.4	0.61	2.11	3.50	0.00	0.26	292.27	0.58	2.07	3.37	0.00	0.24	292.27
			4.74	*13.25*	*45.95*	*0.05*	*1.80*	*3,983.99*	*4.50*	*12.61*	*43.49*	*0.05*	*1.68*	*3,983.99*
Joint Coating Crew (18 Days)														
Other Material Handling Equipment	250	1463.2	1.16	3.08	12.50	0.01	0.43	1,081.60	1.10	2.90	11.86	0.01	0.40	1,081.60
Air Compressor	15	30.72	0.04	0.13	0.22	0.00	0.02	18.47	0.04	0.13	0.21	0.00	0.02	18.47
			1.20	*3.22*	*12.72*	*0.01*	*0.45*	*1,100.08*	*1.13*	*3.03*	*12.07*	*0.01*	*0.42*	*1,100.08*
Lower-in Crew (18 Days)														
Other Material Handling Equipment	250	4389.6	3.47	9.25	37.49	0.04	1.29	3,244.80	3.29	8.71	35.57	0.04	1.20	3,244.80
Tractors/Loaders/Backhoes	250	1100	0.66	1.87	7.36	0.01	0.25	758.00	0.63	1.78	6.84	0.01	0.23	758.00
Rubber Tired Dozer	250	1144.8	1.33	3.74	11.81	0.01	0.52	846.24	1.28	3.58	11.29	0.01	0.49	846.24
Tractors/Loaders/Backhoes	250	1100	0.66	1.87	7.36	0.01	0.25	758.00	0.63	1.78	6.84	0.01	0.23	758.00
			6.13	*16.72*	*64.01*	*0.07*	*2.30*	*5,607.04*	*5.82*	*15.85*	*60.54*	*0.07*	*2.15*	*5,607.04*
Tie-In Crew (30 Days)														
Other Material Handling Equipment	250	4938.3	3.90	10.41	42.17	0.04	1.45	3,650.40	3.70	9.80	40.02	0.04	1.35	3,650.40
Tractors/Loaders/Backhoes	250	1237.5	0.74	2.10	8.28	0.01	0.28	852.75	0.70	2.00	7.69	0.01	0.26	852.75
Rubber Tired Dozer	250	1287.9	1.50	4.20	13.29	0.01	0.58	952.02	1.44	4.03	12.70	0.01	0.56	952.02
			6.15	*16.71*	*63.74*	*0.07*	*2.31*	*5,455.17*	*5.84*	*15.83*	*60.41*	*0.07*	*2.16*	*5,455.17*
Hydro-Test Crew (39 Days)														
Air Compressor	15	86.4	0.11	0.37	0.62	0.00	0.05	51.96	0.10	0.37	0.60	0.00	0.04	51.96
Other Material Handling Equipment	250	1646.1	1.30	3.47	14.06	0.01	0.48	1,216.80	1.23	3.27	13.34	0.01	0.45	1,216.80
Pumps	15	106.56	0.20	0.71	1.18	0.00	0.09	98.80	0.20	0.70	1.14	0.00	0.08	98.80
Pumps	15	53.28	0.10	0.36	0.59	0.00	0.04	49.40	0.10	0.35	0.57	0.00	0.04	49.40
			1.72	*4.91*	*16.45*	*0.02*	*0.66*	*1,416.95*	*1.63*	*4.69*	*15.65*	*0.02*	*0.62*	*1,416.95*
Clean Up Crew (24 Days)														
Rubber Tired Dozer	250	3863.7	4.49	12.61	39.87	0.03	1.75	2,856.06	4.32	12.08	38.11	0.03	1.67	2,856.06
Tractors/Loaders/Backhoes	250	2475	1.49	4.20	16.55	0.02	0.56	1,705.49	1.41	4.01	15.38	0.02	0.52	1,705.49
Grader	250	1647	1.36	3.80	13.92	0.01	0.52	1,258.74	1.29	3.61	13.10	0.01	0.49	1,258.74
Tractors/Loaders/Backhoes	175	742.5	0.45	1.26	4.97	0.01	0.17	511.65	0.42	1.20	4.62	0.01	0.16	511.65
Off-Highway Truck	500	1795.5	1.23	3.82	11.69	0.01	0.44	1,282.25	1.17	3.55	10.92	0.01	0.41	1,282.25
			9.01	*25.68*	*86.99*	*0.09*	*3.43*	*7,614.18*	*8.61*	*24.45*	*82.12*	*0.09*	*3.24*	*7,614.18*

	2009 EF lbs/hp/hr						2010 EF lbs/hp/hr					
	ROG	**CO**	**NOx**	**SOx**	**PM**	**CO2**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**
Environmental Crew	2.56	7.40	29.52	0.03	0.96	1,419.12	2.40	6.98	27.90	0.03	0.89	2,849.41
All 18-Day Crews	35.14	101.28	357.82	0.37	13.43	32,136.66	33.37	95.60	338.03	0.37	12.62	32,136.66
Tie-In Crew	6.15	16.71	63.74	0.07	2.31	5,455.17	5.84	15.83	60.41	0.07	2.16	5,455.17
Hydro Test Crew	1.72	4.91	16.45	0.02	0.66	1,416.95	1.63	4.69	15.65	0.02	0.62	1,416.95
Clean Up Crew	9.01	25.68	86.99	0.09	3.43	7,614.18	8.61	24.45	82.12	0.09	3.24	7,614.18
Total	54.58	155.98	554.53	0.57	20.78	48,042.08	51.85	147.53	524.12	0.57	19.53	49,472.37

HDD			2009 EF lbs/hp/hr						2010 EF lbs/hp/hr					
Equipment	**Max HP**	**Multiplier**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**
	500	3,000.00	1.37	5.07	16.72	0.03	0.57	2,819.00	1.43	5.19	17.76	0.03	0.57	2,819.00
Bore/Drill Rigs	750	4,687.50	2.21	7.92	27.20	0.04	0.90	4,404.68	2.11	7.88	24.13	0.04	0.87	4,404.68
Cranes	250	1,126.60	0.71	1.98	7.09	0.01	0.27	606.95	0.67	1.87	6.70	0.01	0.25	606.95
Excavator	250	1,128.60	0.78	2.10	8.15	0.01	0.28	805.98	0.74	2.01	7.59	0.01	0.26	805.98
Off-Highway	250	1,710.00	1.27	3.33	12.71	0.02	0.45	1,221.19	1.20	3.15	11.84	0.02	0.42	1,221.19
Other Material Handling Equipment	250	5,487.00	4.34	11.57	46.86	0.05	1.61	4,056.00	4.11	10.89	44.46	0.05	1.50	4,056.00
			10.68	*31.96*	*118.73*	*0.15*	*4.08*	*13,913.80*	*10.26*	*30.99*	*112.47*	*0.16*	*3.88*	*13,913.80*

J/B			2009 EF lbs/hp/hr						2010 EF lbs/hp/hr					
Equipment	**Max HP**	**Multiplier**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**
Bore/Drill Rigs	120	900.00	0.94	5.34	7.47	0.01	0.57	845.70	0.79	5.28	6.75	0.01	0.50	845.70
Excavator	250	1,128.60	0.78	2.10	8.15	0.01	0.28	805.98	0.74	2.01	7.59	0.01	0.26	805.98
Other Material Handling Equipment	250	1,829.00	1.45	3.86	15.62	0.02	0.54	1,352.00	1.37	3.63	14.82	0.02	0.50	1,352.00
			3.16	*11.29*	*31.24*	*0.04*	*1.39*	*3,003.68*	*2.90*	*10.91*	*29.16*	*0.04*	*1.26*	*3,003.68*

Trenching			2012 EF					
			lbs/hp/hr					
Equipment	**Max HP**	**Multiplier**	**ROG**	**CO**	**NOx**	**SOx**	**PM**	**CO2**
Environmental, Fence & Pot Hole Crew	**(60 days)**							
Pump	250	2164.5	1.33	4.31	17.11	0.02	0.49	2006.79
Off-Highway Truck	250	1179.9	0.74	2.00	6.84	0.01	0.23	842.62
			2.08	*6.30*	*23.95*	*0.03*	*0.72*	*2849.41*
Grade Crew (18 Days)								
Crawler Tractor	250	4070.4	3.64	10.27	33.49	0.04	1.31	3,263.84
Tractors/Loaders/Backhoes	250	1100	0.56	1.66	5.66	0.01	0.18	758.00
Grader	250	1439.6	1.01	2.88	9.81	0.01	0.35	1,100.23
			5.20	*14.81*	*48.95*	*0.06*	*1.84*	*5,122.07*
Ditch Crew (18 Days)								
Tractors/Loaders/Backhoes	250	5500	2.79	8.29	28.28	0.05	0.92	3,789.98
Trencher	250	1200	1.26	3.75	12.07	0.01	0.48	1,127.60
			4.04	*12.04*	*40.34*	*0.06*	*1.40*	*4,917.58*
Stringing Crew (18 Days)								
Tractors/Loaders/Backhoes	250	1100	0.56	1.66	5.66	0.01	0.18	758.00
Other Material Handling Equipment	250	1463.2	0.96	2.59	10.20	0.01	0.33	1,081.60
Other Material Handling Equipment	500	8024	4.86	14.95	49.22	0.05	1.66	5,931.36
Crawler Tractor	250	1356.8	1.21	3.42	11.16	0.01	0.44	1,087.95
			7.59	*22.62*	*76.24*	*0.09*	*2.61*	*8,858.91*
Bending Crew (18 Days)								
Other Material Handling Equipment	250	2926.4	1.92	5.18	20.41	0.03	0.65	2,163.20
Other Material Handling Equipment	120	519.2	0.77	2.79	4.45	0.00	0.43	383.79
			2.69	*7.97*	*24.85*	*0.03*	*1.08*	*2,547.00*
Pipe Gang (Bead Welders) (18 Days)								
Other Material Handling Equipment	250	1463.2	0.96	2.59	10.20	0.01	0.33	1,081.60
Crawler Tractor	250	1152	1.03	2.91	9.48	0.01	0.37	923.73
Other Material Handling Equipment	250	1180	0.77	2.09	8.23	0.01	0.26	872.26
Off-Highway Truck	250	1140	0.72	1.93	6.61	0.01	0.23	814.13
Welder	15	518.4	0.52	1.99	3.09	0.00	0.21	292.27
			4.00	*11.51*	*37.60*	*0.05*	*1.39*	*3,983.99*
Joint Coating Crew (18 Days)								
Other Material Handling Equipment	250	1463.2	0.96	2.59	10.20	0.01	0.33	1,081.60
Air Compressor	15	30.72	0.03	0.13	0.20	0.00	0.01	18.47
			0.99	*2.72*	*10.40*	*0.01*	*0.34*	*1,100.08*
Lower-in Crew (18 Days)								
Other Material Handling Equipment	250	4389.6	2.88	7.77	30.61	0.04	0.98	3,244.80
Tractors/Loaders/Backhoes	250	1100	0.56	1.66	5.66	0.01	0.18	758.00
Rubber Tired Dozer	250	1144.8	1.18	3.29	10.14	0.01	0.43	846.24
Tractors/Loaders/Backhoes	250	1100	0.56	1.66	5.66	0.01	0.18	758.00
			5.17	*14.37*	*52.06*	*0.07*	*1.78*	*5,607.04*
Tie-In Crew (30 Days)								
Other Material Handling Equipment	250	4938.3	3.24	8.75	34.44	0.04	1.10	3,650.40
Tractors/Loaders/Backhoes	250	1237.5	0.63	1.86	6.36	0.01	0.21	852.75
Rubber Tired Dozer	250	1287.9	1.32	3.70	11.41	0.01	0.49	952.02
			5.19	*14.31*	*52.21*	*0.07*	*1.79*	*5,455.17*
Hydro-Test Crew (39 Days)								
Air Compressor	15	86.4	0.09	0.35	0.55	0.00	0.04	51.96
Other Material Handling Equipment	250	1646.1	1.08	2.92	11.48	0.01	0.37	1,216.80
Pumps	15	106.56	0.18	0.67	1.04	0.00	0.07	98.80
Pumps	15	53.28	0.09	0.34	0.52	0.00	0.04	49.40
			1.44	*4.28*	*13.59*	*0.02*	*0.51*	*1,416.95*
Clean Up Crew (24 Days)								
Rubber Tired Dozer	250	3863.7	3.97	11.09	34.22	0.03	1.46	2,856.06
Tractors/Loaders/Backhoes	250	2475	1.25	3.73	12.72	0.02	0.41	1,705.49
Grader	250	1647	1.15	3.30	11.22	0.01	0.40	1,258.74
Tractors/Loaders/Backhoes	175	742.5	0.38	1.12	3.82	0.01	0.12	511.65
Off-Highway Truck	500	1795.5	1.06	3.14	9.16	0.01	0.33	1,282.25
			7.81	*22.37*	*71.15*	*0.09*	*2.73*	*7,614.18*

	2012 EF					
	lbs/hp/hr					
	ROG	**CO**	**NOx**	**SOx**	**PM**	**CO2**
Environmental Crew	2.08	6.30	23.95	0.03	0.72	2,849.41
All 18-Day Crews	29.69	86.04	290.45	0.37	10.44	32,136.66
Tie-In Crew	5.19	14.31	52.21	0.07	1.79	5,455.17
Hydro Test Crew	1.44	4.28	13.59	0.02	0.51	1,416.95
Clean Up Crew	7.81	22.37	71.15	0.09	2.73	7,614.18
Total	46.21	133.29	451.35	0.57	16.20	49,472.37

HDD

Equipment	Max HP	Multiplier	2012 EF lbs/hp/hr ROG	CO	NOx	SOx	PM	CO2
	500	3,000.00	1.26	5.15	13.07	0.03	0.40	2,819.00
Bore/Drill Rigs	750	4,687.50	1.91	7.82	18.61	0.04	0.62	4,404.68
Cranes	250	1,126.60	0.60	1.66	5.80	0.01	0.21	606.95
Excavator	250	1,128.60	0.66	1.84	6.32	0.01	0.21	805.98
Off-Highway	250	1,710.00	1.08	2.89	9.91	0.02	0.34	1,221.19
Other Material Handling Equipment	250	5,487.00	3.60	9.72	38.26	0.05	1.22	4,056.00
			9.10	*29.07*	*91.97*	*0.16*	*3.00*	*13,913.80*

J/B

Equipment	Max HP	Multiplier	2012 EF lbs/hp/hr ROG	CO	NOx	SOx	PM	CO2
Bore/Drill Rigs	120	900.00	0.56	5.18	5.51	0.01	0.36	845.70
Excavator	250	1,128.60	0.66	1.84	6.32	0.01	0.21	805.98
Other Material Handling Equipment	250	1,829.00	1.20	3.24	12.75	0.02	0.41	1,352.00
			2.42	*10.26*	*24.58*	*0.04*	*0.98*	*3,003.68*

D-3: URBEMIS Output

9/9/2008 6:08:45 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 406.urb924

Project Name: Line 406

Project Location: Yolo-Solano 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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2009 TOTALS (lbs/day unmitigated)	6.62	48.42	28.93	0.02	169.91	3.02	170.17	35.48	2.78	35.72	4,295.85
2009 TOTALS (lbs/day mitigated)	6.62	48.42	28.93	0.02	66.27	3.02	66.53	13.84	2.78	15.24	4,295.85

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

9/9/2008 6:08:45 PM

Time Slice 5/4/2009-5/8/2009 Active Days: 5	**6.62**	**48.42**	**28.93**	0.00	153.02	**3.02**	156.03	31.96	**2.78**	34.73	**4,295.85**
Asphalt 05/04/2009-05/08/2009	2.16	12.69	9.22	0.00	0.01	1.09	1.10	0.00	1.01	1.01	1,160.55
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.37
Paving Worker Trips	0.07	0.12	2.17	0.00	0.01	0.01	0.01	0.00	0.00	0.01	178.95
Mass Grading 05/04/2009-05/22/2009	4.47	35.73	19.71	0.00	153.01	1.93	154.93	31.95	1.77	33.73	3,135.30
Mass Grading Dust	0.00	0.00	0.00	0.00	153.00	0.00	153.00	31.95	0.00	31.95	0.00
Mass Grading Off Road Diesel	4.42	35.65	18.16	0.00	0.00	1.92	1.92	0.00	1.77	1.77	3,007.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.05	0.08	1.55	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.82
Time Slice 5/11/2009-5/22/2009 Active Days: 10	4.47	35.73	19.71	0.00	153.01	1.93	154.93	31.95	1.77	33.73	3,135.30
Mass Grading 05/04/2009-05/22/2009	4.47	35.73	19.71	0.00	153.01	1.93	154.93	31.95	1.77	33.73	3,135.30
Mass Grading Dust	0.00	0.00	0.00	0.00	153.00	0.00	153.00	31.95	0.00	31.95	0.00
Mass Grading Off Road Diesel	4.42	35.65	18.16	0.00	0.00	1.92	1.92	0.00	1.77	1.77	3,007.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.05	0.08	1.55	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.82

Time Slice 6/1/2009-7/31/2009 Active Days: 45	0.68	6.99	2.33	0.00	169.91	0.26	170.17	35.48	0.24	35.72	726.50
Fine Grading 06/01/2009-07/31/2009	0.68	6.99	2.33	0.00	169.91	0.26	170.17	35.48	0.24	35.72	726.50
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.57	5.61	1.47	0.00	0.00	0.20	0.20	0.00	0.18	0.18	539.89
Fine Grading On Road Diesel	0.11	1.36	0.55	0.00	0.01	0.06	0.07	0.00	0.06	0.06	161.04
Fine Grading Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/3/2009-8/18/2009 Active Days: 12	0.58	5.63	1.77	0.00	126.94	0.20	127.14	26.51	0.18	26.69	565.46
Fine Grading 08/03/2009-08/18/2009	0.58	5.63	1.77	0.00	126.94	0.20	127.14	26.51	0.18	26.69	565.46
Fine Grading Dust	0.00	0.00	0.00	0.00	126.93	0.00	126.93	26.51	0.00	26.51	0.00
Fine Grading Off Road Diesel	0.57	5.61	1.47	0.00	0.00	0.20	0.20	0.00	0.18	0.18	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/24/2009-8/25/2009 Active Days: 2	0.58	5.63	1.77	0.00	35.98	0.20	36.18	7.51	0.18	7.70	565.46
Fine Grading 08/24/2009-08/25/2009	0.58	5.63	1.77	0.00	35.98	0.20	36.18	7.51	0.18	7.70	565.46
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.57	5.61	1.47	0.00	0.00	0.20	0.20	0.00	0.18	0.18	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56

Time Slice 8/27/2009-8/28/2009 Active Days: 2	1.42	18.35	7.49	**0.02**	0.08	0.81	0.89	0.02	0.75	0.77	2,174.04
Fine Grading 08/27/2009-08/28/2009	1.42	18.35	7.49	0.02	0.08	0.81	0.89	0.02	0.75	0.77	2,174.04
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.42	18.35	7.49	0.02	0.08	0.81	0.89	0.02	0.75	0.77	2,174.04
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2009 - 7/31/2009 - Trenching Dust

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 40

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/3/2009 - 8/18/2009 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/24/2009 - 8/25/2009 - Jack and Bore Crossing

Total Acres Disturbed: 1

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Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/27/2009 - 8/28/2009 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 540

Off-Road Equipment:

Phase: Mass Grading 5/4/2009 - 5/22/2009 - Dunnigan Hills

Total Acres Disturbed: 30.6

Maximum Daily Acreage Disturbed: 7.65

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Graders (174 hp) operating at a 0.61 load factor for 8 hours per day

1 Rubber Tired Dozers (357 hp) operating at a 0.59 load factor for 8 hours per day

2 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Paving 5/4/2009 - 5/8/2009 - Minimal Repaving

Acres to be Paved: 0.01

Off-Road Equipment:

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4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 5/4/2009-5/8/2009 Active Days: 5	**6.62**	**48.42**	**28.93**	0.00	59.69	**3.02**	62.70	12.47	**2.78**	15.24	**4,295.85**
Asphalt 05/04/2009-05/08/2009	2.16	12.69	9.22	0.00	0.01	1.09	1.10	0.00	1.01	1.01	1,160.55
Paving Off-Gas	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	2.08	12.55	7.05	0.00	0.00	1.09	1.09	0.00	1.00	1.00	979.23
Paving On Road Diesel	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.37
Paving Worker Trips	0.07	0.12	2.17	0.00	0.01	0.01	0.01	0.00	0.00	0.01	178.95
Mass Grading 05/04/2009-05/22/2009	4.47	35.73	19.71	0.00	59.68	1.93	61.60	12.46	1.77	14.23	3,135.30
Mass Grading Dust	0.00	0.00	0.00	0.00	59.67	0.00	59.67	12.46	0.00	12.46	0.00
Mass Grading Off Road Diesel	4.42	35.65	18.16	0.00	0.00	1.92	1.92	0.00	1.77	1.77	3,007.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.05	0.08	1.55	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.82

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Time Slice 5/11/2009-5/22/2009 Active Days: 10	4.47	35.73	19.71	0.00	59.68	1.93	61.60	12.46	1.77	14.23	3,135.30
Mass Grading 05/04/2009-05/22/2009	4.47	35.73	19.71	0.00	59.68	1.93	61.60	12.46	1.77	14.23	3,135.30
Mass Grading Dust	0.00	0.00	0.00	0.00	59.67	0.00	59.67	12.46	0.00	12.46	0.00
Mass Grading Off Road Diesel	4.42	35.65	18.16	0.00	0.00	1.92	1.92	0.00	1.77	1.77	3,007.48
Mass Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mass Grading Worker Trips	0.05	0.08	1.55	0.00	0.01	0.00	0.01	0.00	0.00	0.01	127.82
Time Slice 6/1/2009-7/31/2009 Active Days: 45	0.68	6.99	2.33	0.00	66.27	0.26	66.53	13.84	0.24	14.08	726.50
Fine Grading 06/01/2009-07/31/2009	0.68	6.99	2.33	0.00	66.27	0.26	66.53	13.84	0.24	14.08	726.50
Fine Grading Dust	0.00	0.00	0.00	0.00	66.26	0.00	66.26	13.84	0.00	13.84	0.00
Fine Grading Off Road Diesel	0.57	5.61	1.47	0.00	0.00	0.20	0.20	0.00	0.18	0.18	539.89
Fine Grading On Road Diesel	0.11	1.36	0.55	0.00	0.01	0.06	0.07	0.00	0.06	0.06	161.04
Fine Grading Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/3/2009-8/18/2009 Active Days: 12	0.58	5.63	1.77	0.00	49.51	0.20	49.71	10.34	0.18	10.52	565.46
Fine Grading 08/03/2009-08/18/2009	0.58	5.63	1.77	0.00	49.51	0.20	49.71	10.34	0.18	10.52	565.46
Fine Grading Dust	0.00	0.00	0.00	0.00	49.50	0.00	49.50	10.34	0.00	10.34	0.00
Fine Grading Off Road Diesel	0.57	5.61	1.47	0.00	0.00	0.20	0.20	0.00	0.18	0.18	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56

Time Slice 8/24/2009-8/25/2009 Active Days: 2	0.58	5.63	1.77	0.00	14.03	0.20	14.23	2.93	0.18	3.12	565.46
Fine Grading 08/24/2009-08/25/2009	0.58	5.63	1.77	0.00	14.03	0.20	14.23	2.93	0.18	3.12	565.46
Fine Grading Dust	0.00	0.00	0.00	0.00	14.03	0.00	14.03	2.93	0.00	2.93	0.00
Fine Grading Off Road Diesel	0.57	5.61	1.47	0.00	0.00	0.20	0.20	0.00	0.18	0.18	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/27/2009-8/28/2009 Active Days: 2	1.42	18.35	7.49	**0.02**	0.08	0.81	0.89	0.02	0.75	0.77	2,174.04
Fine Grading 08/27/2009-08/28/2009	1.42	18.35	7.49	0.02	0.08	0.81	0.89	0.02	0.75	0.77	2,174.04
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.42	18.35	7.49	0.02	0.08	0.81	0.89	0.02	0.75	0.77	2,174.04
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2009 - 7/31/2009 - Trenching Dust

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/3/2009 - 8/18/2009 - HDD Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/24/2009 - 8/25/2009 - Jack and Bore Crossing

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For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Mass Grading 5/4/2009 - 5/22/2009 - Dunnigan Hills

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 407E.urb924

Project Name: Line 407-E

Project Location: California State-wide

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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	2.75	30.26	11.56	0.04	169.92	1.33	171.25	35.49	1.22	36.71	4,187.05
2010 TOTALS (lbs/day mitigated)	2.75	30.26	11.56	0.04	66.29	1.33	67.61	13.85	1.22	15.07	4,187.05

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 6/1/2010-6/8/2010 Active Days: 6	**2.75**	20.16	**11.56**	0.01	**169.92**	**1.33**	**171.25**	**35.49**	**1.22**	**36.71**	2,128.03
Asphalt 06/01/2010-06/08/2010	2.02	12.01	8.91	0.00	0.01	1.03	1.04	0.00	0.95	0.95	1,159.99
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Paving Worker Trips	0.06	0.11	1.92	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.78
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	169.92	0.29	170.21	35.49	0.27	35.76	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 6/9/2010-7/30/2010 Active Days: 38	0.73	8.15	2.65	0.00	169.92	0.29	170.21	35.49	0.27	35.76	968.03
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	169.92	0.29	170.21	35.49	0.27	35.76	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 8/2/2010-8/18/2010 Active Days: 13	0.54	5.24	1.67	0.00	126.94	0.18	127.12	26.51	0.17	26.68	565.43
Fine Grading 08/01/2010-08/18/2010	0.54	5.24	1.67	0.00	126.94	0.18	127.12	26.51	0.17	26.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	126.93	0.00	126.93	26.51	0.00	26.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	1.97	**30.26**	10.20	**0.04**	0.15	1.15	1.30	0.05	1.06	1.11	**4,187.05**
Fine Grading 08/22/2010-08/25/2010	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

9/9/2008 7:06:15 PM

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 1040

9/9/2008 7:06:15 PM

Off-Road Equipment:

Phase: Paving 6/1/2010 - 6/8/2010 - Minimal Paving Activity

Acres to be Paved: 0.01

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2010-6/8/2010 Active Days: 6	**2.75**	20.16	**11.56**	0.01	66.29	**1.33**	67.61	13.85	**1.22**	15.07	2,128.03
Asphalt 06/01/2010-06/08/2010	2.02	12.01	8.91	0.00	0.01	1.03	1.04	0.00	0.95	0.95	1,159.99
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Paving Worker Trips	0.06	0.11	1.92	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.78
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	66.28	0.29	66.57	13.84	0.27	14.11	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	66.26	0.00	66.26	13.84	0.00	13.84	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 6/9/2010-7/30/2010 Active Days: 38	0.73	8.15	2.65	0.00	66.28	0.29	66.57	13.84	0.27	14.11	968.03
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	66.28	0.29	66.57	13.84	0.27	14.11	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	66.26	0.00	66.26	13.84	0.00	13.84	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/2/2010-8/18/2010 Active Days: 13	0.54	5.24	1.67	0.00	49.51	0.18	49.69	10.34	0.17	10.51	565.43
Fine Grading 08/01/2010-08/18/2010	0.54	5.24	1.67	0.00	49.51	0.18	49.69	10.34	0.17	10.51	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	49.50	0.00	49.50	10.34	0.00	10.34	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	14.03	0.18	14.22	2.93	0.17	3.10	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	14.03	0.18	14.22	2.93	0.17	3.10	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	14.03	0.00	14.03	2.93	0.00	2.93	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 8/23/2010-8/25/2010 Active Days: 3	1.97	**30.26**	10.20	**0.04**	0.15	1.15	1.30	0.05	1.06	1.11	**4,187.05**
Fine Grading 08/22/2010-08/25/2010	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

9/9/2008 7:04:16 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\DFM.urb924

Project Name: DFM

Project Location: California State-wide

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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	0.59	9.08	3.06	0.01	169.90	0.35	170.11	35.48	0.32	35.67	1,256.11
2010 TOTALS (lbs/day mitigated)	0.59	9.08	3.06	0.01	66.27	0.35	66.47	13.84	0.32	14.03	1,256.11

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 6/1/2010-7/30/2010 Active Days: 44	0.58	5.83	1.87	0.00	**169.90**	0.21	**170.11**	**35.48**	0.19	**35.67**	645.95
Fine Grading 06/01/2010-07/30/2010	0.58	5.83	1.87	0.00	169.90	0.21	170.11	35.48	0.19	35.67	645.95
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.04	0.58	0.20	0.00	0.00	0.02	0.03	0.00	0.02	0.02	80.52
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	**0.59**	**9.08**	**3.06**	**0.01**	0.04	**0.35**	0.39	0.01	**0.32**	0.33	**1,256.11**
Fine Grading 08/22/2010-08/25/2010	0.59	9.08	3.06	0.01	0.04	0.35	0.39	0.01	0.32	0.33	1,256.11
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.59	9.08	3.06	0.01	0.04	0.35	0.39	0.01	0.32	0.33	1,256.11
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

9/9/2008 7:04:16 PM

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 20

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 312

Off-Road Equipment:

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 6/1/2010-7/30/2010 Active Days: 44	0.58	5.83	1.87	0.00	66.27	0.21	66.47	13.84	0.19	14.03	645.95
Fine Grading 06/01/2010-07/30/2010	0.58	5.83	1.87	0.00	66.27	0.21	66.47	13.84	0.19	14.03	645.95
Fine Grading Dust	0.00	0.00	0.00	0.00	66.26	0.00	66.26	13.84	0.00	13.84	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.04	0.58	0.20	0.00	0.00	0.02	0.03	0.00	0.02	0.02	80.52
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	14.03	0.18	14.22	2.93	0.17	3.10	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	14.03	0.18	14.22	2.93	0.17	3.10	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	14.03	0.00	14.03	2.93	0.00	2.93	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	**0.59**	**9.08**	**3.06**	**0.01**	0.04	**0.35**	0.39	0.01	**0.32**	0.33	**1,256.11**
Fine Grading 08/22/2010-08/25/2010	0.59	9.08	3.06	0.01	0.04	0.35	0.39	0.01	0.32	0.33	1,256.11
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.59	9.08	3.06	0.01	0.04	0.35	0.39	0.01	0.32	0.33	1,256.11
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

9/9/2008 7:04:16 PM

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

9/9/2008 7:14:49 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 407W.urb924

Project Name: Line 407-W

Project Location: California State-wide

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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2012 TOTALS (lbs/day unmitigated)	0.65	9.36	3.24	0.01	169.92	0.35	170.15	35.49	0.32	35.71	1,610.40
2012 TOTALS (lbs/day mitigated)	0.65	9.36	3.24	0.01	66.28	0.35	66.51	13.84	0.32	14.06	1,610.40

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

9/9/2008 7:14:49 PM

Time Slice 6/1/2012-7/30/2012 Active Days: 42	0.65	6.73	2.33	0.00	169.92	0.24	170.15	35.49	0.22	35.71	968.05
Fine Grading 06/01/2012-07/30/2012	0.65	6.73	2.33	0.00	169.92	0.24	170.15	35.49	0.22	35.71	968.05
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.48	4.38	1.28	0.00	0.00	0.15	0.15	0.00	0.14	0.14	539.89
Fine Grading On Road Diesel	0.16	2.34	0.81	0.00	0.01	0.09	0.10	0.00	0.08	0.09	402.60
Fine Grading Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/1/2012-8/17/2012 Active Days: 13	0.49	4.39	1.52	0.00	126.94	0.15	127.09	26.51	0.14	26.65	565.45
Fine Grading 08/01/2012-08/18/2012	0.49	4.39	1.52	0.00	126.94	0.15	127.09	26.51	0.14	26.65	565.45
Fine Grading Dust	0.00	0.00	0.00	0.00	126.93	0.00	126.93	26.51	0.00	26.51	0.00
Fine Grading Off Road Diesel	0.48	4.38	1.28	0.00	0.00	0.15	0.15	0.00	0.14	0.14	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/20/2012-8/21/2012 Active Days: 2	0.49	4.39	1.52	0.00	35.98	0.15	36.13	7.51	0.14	7.65	565.45
Fine Grading 08/19/2012-08/21/2012	0.49	4.39	1.52	0.00	35.98	0.15	36.13	7.51	0.14	7.65	565.45
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.48	4.38	1.28	0.00	0.00	0.15	0.15	0.00	0.14	0.14	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56

Time Slice 8/22/2012-8/24/2012 Active Days: 3	0.65	9.36	3.24	0.01	0.06	0.35	0.41	0.02	0.32	0.34	1,610.40
Fine Grading 08/22/2012-08/25/2012	0.65	9.36	3.24	0.01	0.06	0.35	0.41	0.02	0.32	0.34	1,610.40
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.65	9.36	3.24	0.01	0.06	0.35	0.41	0.02	0.32	0.34	1,610.40
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2012 - 7/30/2012 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2012 - 8/18/2012 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2012 - 8/21/2012 - Jack and Bore Crossing

Total Acres Disturbed: 1

9/9/2008 7:14:49 PM

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2012 - 8/25/2012 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 400

Off-Road Equipment:

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2012-7/30/2012 Active Days: 42	0.65	6.73	2.33	0.00	66.28	0.24	66.51	13.84	0.22	14.06	968.05
Fine Grading 06/01/2012-07/30/2012	0.65	6.73	2.33	0.00	66.28	0.24	66.51	13.84	0.22	14.06	968.05
Fine Grading Dust	0.00	0.00	0.00	0.00	66.26	0.00	66.26	13.84	0.00	13.84	0.00
Fine Grading Off Road Diesel	0.48	4.38	1.28	0.00	0.00	0.15	0.15	0.00	0.14	0.14	539.89
Fine Grading On Road Diesel	0.16	2.34	0.81	0.00	0.01	0.09	0.10	0.00	0.08	0.09	402.60
Fine Grading Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56

Time Slice 8/1/2012-8/17/2012 Active Days: 13	0.49	4.39	1.52	0.00	49.51	0.15	49.66	10.34	0.14	10.48	565.45
Fine Grading 08/01/2012-08/18/2012	0.49	4.39	1.52	0.00	49.51	0.15	49.66	10.34	0.14	10.48	565.45
Fine Grading Dust	0.00	0.00	0.00	0.00	49.50	0.00	49.50	10.34	0.00	10.34	0.00
Fine Grading Off Road Diesel	0.48	4.38	1.28	0.00	0.00	0.15	0.15	0.00	0.14	0.14	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/20/2012-8/21/2012 Active Days: 2	0.49	4.39	1.52	0.00	14.03	0.15	14.18	2.93	0.14	3.07	565.45
Fine Grading 08/19/2012-08/21/2012	0.49	4.39	1.52	0.00	14.03	0.15	14.18	2.93	0.14	3.07	565.45
Fine Grading Dust	0.00	0.00	0.00	0.00	14.03	0.00	14.03	2.93	0.00	2.93	0.00
Fine Grading Off Road Diesel	0.48	4.38	1.28	0.00	0.00	0.15	0.15	0.00	0.14	0.14	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.01	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.56
Time Slice 8/22/2012-8/24/2012 Active Days: 3	0.65	9.36	3.24	0.01	0.06	0.35	0.41	0.02	0.32	0.34	1,610.40
Fine Grading 08/22/2012-08/25/2012	0.65	9.36	3.24	0.01	0.06	0.35	0.41	0.02	0.32	0.34	1,610.40
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.65	9.36	3.24	0.01	0.06	0.35	0.41	0.02	0.32	0.34	1,610.40
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2012 - 7/30/2012 - Trenching - Remaining

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

9/9/2008 7:14:49 PM

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2012 - 8/18/2012 - HDD Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2012 - 8/21/2012 - Jack and Bore Crossing

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

9/10/2008 8:36:50 AM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\Documents and Settings\mba\Desktop\23440005 PG&E Pipeline AQ\Modeling\PG&E Line 407E_Mitigated.urb924

Project Name: Line 407-E - Mitigated

Project Location: California State-wide

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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	2.75	30.26	11.56	0.04	169.92	1.33	171.25	35.49	1.22	36.71	4,187.05
2010 TOTALS (lbs/day mitigated)	2.75	30.26	11.56	0.04	16.19	1.33	17.52	3.38	1.22	4.60	4,187.05

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 6/1/2010-6/8/2010 Active Days: 6	**2.75**	20.16	**11.56**	0.01	**169.92**	**1.33**	**171.25**	**35.49**	**1.22**	**36.71**	2,128.03
Asphalt 06/01/2010-06/08/2010	2.02	12.01	8.91	0.00	0.01	1.03	1.04	0.00	0.95	0.95	1,159.99
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Paving Worker Trips	0.06	0.11	1.92	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.78
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	169.92	0.29	170.21	35.49	0.27	35.76	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 6/9/2010-7/30/2010 Active Days: 38	0.73	8.15	2.65	0.00	169.92	0.29	170.21	35.49	0.27	35.76	968.03
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	169.92	0.29	170.21	35.49	0.27	35.76	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 8/2/2010-8/18/2010 Active Days: 13	0.54	5.24	1.67	0.00	126.94	0.18	127.12	26.51	0.17	26.68	565.43
Fine Grading 08/01/2010-08/18/2010	0.54	5.24	1.67	0.00	126.94	0.18	127.12	26.51	0.17	26.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	126.93	0.00	126.93	26.51	0.00	26.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	1.97	**30.26**	10.20	**0.04**	0.15	1.15	1.30	0.05	1.06	1.11	**4,187.05**
Fine Grading 08/22/2010-08/25/2010	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

9/10/2008 8:36:51 AM

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 100

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 1040

9/10/2008 8:36:51 AM

Off-Road Equipment:

Phase: Paving 6/1/2010 - 6/8/2010 - Minimal Paving Activity

Acres to be Paved: 0.01

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2010-6/8/2010 Active Days: 6	**2.75**	20.16	**11.56**	0.01	16.19	**1.33**	17.52	3.38	**1.22**	4.60	2,128.03
Asphalt 06/01/2010-06/08/2010	2.02	12.01	8.91	0.00	0.01	1.03	1.04	0.00	0.95	0.95	1,159.99
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Paving Worker Trips	0.06	0.11	1.92	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.78
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	16.18	0.29	16.48	3.38	0.27	3.65	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	16.17	0.00	16.17	3.38	0.00	3.38	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 6/9/2010-7/30/2010 Active Days: 38	0.73	8.15	2.65	0.00	16.18	0.29	16.48	3.38	0.27	3.65	968.03
Fine Grading 06/01/2010-07/30/2010	0.73	8.15	2.65	0.00	16.18	0.29	16.48	3.38	0.27	3.65	968.03
Fine Grading Dust	0.00	0.00	0.00	0.00	16.17	0.00	16.17	3.38	0.00	3.38	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.19	2.91	0.98	0.00	0.01	0.11	0.13	0.00	0.10	0.11	402.60
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/2/2010-8/18/2010 Active Days: 13	0.54	5.24	1.67	0.00	12.08	0.18	12.26	2.52	0.17	2.69	565.43
Fine Grading 08/01/2010-08/18/2010	0.54	5.24	1.67	0.00	12.08	0.18	12.26	2.52	0.17	2.69	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	12.08	0.00	12.08	2.52	0.00	2.52	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	3.43	0.18	3.61	0.72	0.17	0.88	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	3.43	0.18	3.61	0.72	0.17	0.88	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	3.42	0.00	3.42	0.72	0.00	0.72	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 8/23/2010-8/25/2010 Active Days: 3	1.97	**30.26**	10.20	**0.04**	0.15	1.15	1.30	0.05	1.06	1.11	**4,187.05**
Fine Grading 08/22/2010-08/25/2010	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	1.97	30.26	10.20	0.04	0.15	1.15	1.30	0.05	1.06	1.11	4,187.05
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

9/9/2008 7:39:24 PM

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name:

Project Name: Operational Trips

Project Location: California State-wide

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

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.03	0.15	0.29	0.00	0.10	0.02	66.65

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10	PM2.5	CO2
TOTALS (lbs/day, unmitigated)	0.03	0.15	0.29	0.00	0.10	0.02	66.65

9/9/2008 7:39:24 PM

Operational Unmitigated Detail Report:

OPERATIONAL EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

Source	ROG	NOX	CO	SO2	PM10	PM25	CO2
Operational Trips	0.03	0.15	0.29	0.00	0.10	0.02	66.65
TOTALS (lbs/day, unmitigated)	0.03	0.15	0.29	0.00	0.10	0.02	66.65

Operational Settings:

Does not include correction for passby trips

Does not include double counting adjustment for internal trips

Analysis Year: 2010 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
Operational Trips		1.00	acres	1.00	1.00	60.00
					1.00	60.00

Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	0.0	1.2	98.4	0.4
Light Truck < 3750 lbs	0.0	2.8	91.7	5.5
Light Truck 3751-5750 lbs	0.0	0.9	98.6	0.5
Med Truck 5751-8500 lbs	0.0	1.1	98.9	0.0
Lite-Heavy Truck 8501-10,000 lbs	100.0	0.0	76.5	23.5
Lite-Heavy Truck 10,001-14,000 lbs	0.0	0.0	50.0	50.0

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Vehicle Fleet Mix

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Med-Heavy Truck 14,001-33,000 lbs	0.0	0.0	20.0	80.0
Heavy-Heavy Truck 33,001-60,000 lbs	0.0	0.0	0.0	100.0
Other Bus	0.0	0.0	0.0	100.0
Urban Bus	0.0	0.0	0.0	100.0
Motorcycle	0.0	68.6	31.4	0.0
School Bus	0.0	0.0	0.0	100.0
Motor Home	0.0	0.0	90.0	10.0

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)	60.0	60.0	60.0	60.0	60.0	60.0
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)						
Operational Trips				2.0	1.0	97.0

D-4: Line 407 East Mitigated

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\23440005 PG&E Line 406-407\AQ Work\Modeling\PG&E Line 407E_Mitigated.urb924

Project Name: Line 407-E - Mitigated

Project Location: California State-wide

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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	2.65	18.71	11.07	0.02	169.92	1.27	171.19	35.49	1.17	36.66	2,093.52
2010 TOTALS (lbs/day mitigated)	2.65	18.71	11.07	0.02	16.18	1.27	17.46	3.38	1.17	4.55	2,093.52

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

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Time Slice 6/1/2010-6/8/2010 Active Days: 6	**2.65**	**18.71**	**11.07**	0.00	**169.92**	**1.27**	**171.19**	**35.49**	**1.17**	**36.66**	1,926.72
Asphalt 06/01/2010-06/08/2010	2.02	12.01	8.91	0.00	0.01	1.03	1.04	0.00	0.95	0.95	1,159.99
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Paving Worker Trips	0.06	0.11	1.92	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.78
Fine Grading 06/01/2010-07/30/2010	0.64	6.70	2.16	0.00	169.91	0.24	170.15	35.48	0.22	35.70	766.73
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.09	1.45	0.49	0.00	0.01	0.06	0.06	0.00	0.05	0.05	201.30
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 6/9/2010-7/30/2010 Active Days: 38	0.64	6.70	2.16	0.00	169.91	0.24	170.15	35.48	0.22	35.70	766.73
Fine Grading 06/01/2010-07/30/2010	0.64	6.70	2.16	0.00	169.91	0.24	170.15	35.48	0.22	35.70	766.73
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.09	1.45	0.49	0.00	0.01	0.06	0.06	0.00	0.05	0.05	201.30
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

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Time Slice 8/2/2010-8/18/2010 Active Days: 13	0.54	5.24	1.67	0.00	126.94	0.18	127.12	26.51	0.17	26.68	565.43
Fine Grading 08/01/2010-08/18/2010	0.54	5.24	1.67	0.00	126.94	0.18	127.12	26.51	0.17	26.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	126.93	0.00	126.93	26.51	0.00	26.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	0.99	15.13	5.10	**0.02**	0.07	0.58	0.65	0.02	0.53	0.56	**2,093.52**
Fine Grading 08/22/2010-08/25/2010	0.99	15.13	5.10	0.02	0.07	0.58	0.65	0.02	0.53	0.56	2,093.52
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.99	15.13	5.10	0.02	0.07	0.58	0.65	0.02	0.53	0.56	2,093.52
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

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Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 50

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 223 cubic yards/day; Offsite Cut/Fill: 223 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 520

10/27/2008 12:22:56 PM

Off-Road Equipment:

Phase: Paving 6/1/2010 - 6/8/2010 - Minimal Paving Activity

Acres to be Paved: 0.01

Off-Road Equipment:

4 Cement and Mortar Mixers (10 hp) operating at a 0.56 load factor for 6 hours per day

1 Pavers (100 hp) operating at a 0.62 load factor for 7 hours per day

1 Rollers (95 hp) operating at a 0.56 load factor for 7 hours per day

1 Tractors/Loaders/Backhoes (108 hp) operating at a 0.55 load factor for 7 hours per day

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
Time Slice 6/1/2010-6/8/2010 Active Days: 6	**2.65**	**18.71**	**11.07**	0.00	16.18	**1.27**	17.46	3.38	**1.17**	4.55	1,926.72
Asphalt 06/01/2010-06/08/2010	2.02	12.01	8.91	0.00	0.01	1.03	1.04	0.00	0.95	0.95	1,159.99
Paving Off-Gas	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Paving Off Road Diesel	1.95	11.89	6.98	0.00	0.00	1.03	1.03	0.00	0.94	0.94	979.23
Paving On Road Diesel	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.99
Paving Worker Trips	0.06	0.11	1.92	0.00	0.01	0.00	0.01	0.00	0.00	0.01	178.78
Fine Grading 06/01/2010-07/30/2010	0.64	6.70	2.16	0.00	16.18	0.24	16.42	3.38	0.22	3.60	766.73
Fine Grading Dust	0.00	0.00	0.00	0.00	16.17	0.00	16.17	3.38	0.00	3.38	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.09	1.45	0.49	0.00	0.01	0.06	0.06	0.00	0.05	0.05	201.30
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 6/9/2010-7/30/2010 Active Days: 38	0.64	6.70	2.16	0.00	16.18	0.24	16.42	3.38	0.22	3.60	766.73
Fine Grading 06/01/2010-07/30/2010	0.64	6.70	2.16	0.00	16.18	0.24	16.42	3.38	0.22	3.60	766.73
Fine Grading Dust	0.00	0.00	0.00	0.00	16.17	0.00	16.17	3.38	0.00	3.38	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.09	1.45	0.49	0.00	0.01	0.06	0.06	0.00	0.05	0.05	201.30
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/2/2010-8/18/2010 Active Days: 13	0.54	5.24	1.67	0.00	12.08	0.18	12.26	2.52	0.17	2.69	565.43
Fine Grading 08/01/2010-08/18/2010	0.54	5.24	1.67	0.00	12.08	0.18	12.26	2.52	0.17	2.69	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	12.08	0.00	12.08	2.52	0.00	2.52	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	3.43	0.18	3.61	0.72	0.17	0.88	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	3.43	0.18	3.61	0.72	0.17	0.88	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	3.42	0.00	3.42	0.72	0.00	0.72	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54

Time Slice 8/23/2010-8/25/2010 Active Days: 3	0.99	15.13	5.10	**0.02**	0.07	0.58	0.65	0.02	0.53	0.56	**2,093.52**
Fine Grading 08/22/2010-08/25/2010	0.99	15.13	5.10	0.02	0.07	0.58	0.65	0.02	0.53	0.56	2,093.52
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.99	15.13	5.10	0.02	0.07	0.58	0.65	0.02	0.53	0.56	2,093.52
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/1/2010 - 8/18/2010 - HDD Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 2x daily watering mitigation reduces emissions by:

PM10: 55% PM25: 55%

D-5: DFM Mitigated

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Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: S:\Projects\23440005 PG&E Line 406-407\AQ Work\Modeling\DFM_Mitigated.urb924

Project Name: DFM Mitigated

Project Location: California State-wide

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	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2
2010 TOTALS (lbs/day unmitigated)	0.56	5.53	1.77	0.01	169.90	0.19	170.10	35.48	0.18	35.66	628.06
2010 TOTALS (lbs/day mitigated)	0.56	5.53	1.77	0.01	16.17	0.19	16.37	3.38	0.18	3.56	628.06

Construction Unmitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

10/27/2008 12:22:08 PM

Time Slice 6/1/2010-7/30/2010 Active Days: 44	**0.56**	**5.53**	**1.77**	0.00	**169.90**	**0.19**	**170.10**	**35.48**	**0.18**	**35.66**	605.69
Fine Grading 06/01/2010-07/30/2010	0.56	5.53	1.77	0.00	169.90	0.19	170.10	35.48	0.18	35.66	605.69
Fine Grading Dust	0.00	0.00	0.00	0.00	169.90	0.00	169.90	35.48	0.00	35.48	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.02	0.29	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	40.26
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	35.98	0.18	36.17	7.51	0.17	7.68	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	35.98	0.00	35.98	7.51	0.00	7.51	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	0.30	4.54	1.53	**0.01**	0.02	0.17	0.20	0.01	0.16	0.17	**628.06**
Fine Grading 08/22/2010-08/25/2010	0.30	4.54	1.53	0.01	0.02	0.17	0.20	0.01	0.16	0.17	628.06
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.30	4.54	1.53	0.01	0.02	0.17	0.20	0.01	0.16	0.17	628.06
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Phase Assumptions

Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

10/27/2008 12:22:08 PM

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 300 cubic yards/day; Offsite Cut/Fill: 300 cubic yards/day

On Road Truck Travel (VMT): 10

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

Total Acres Disturbed: 1

Maximum Daily Acreage Disturbed: 0.25

Fugitive Dust Level of Detail: Low

Onsite Cut/Fill: 60 cubic yards/day; Offsite Cut/Fill: 60 cubic yards/day

On Road Truck Travel (VMT): 0

Off-Road Equipment:

1 Water Trucks (189 hp) operating at a 0.5 load factor for 8 hours per day

Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

Total Acres Disturbed: 0

Maximum Daily Acreage Disturbed: 0

Fugitive Dust Level of Detail: Default

20 lbs per acre-day

On Road Truck Travel (VMT): 156

Off-Road Equipment:

Construction Mitigated Detail Report:

CONSTRUCTION EMISSION ESTIMATES Summer Pounds Per Day, Mitigated

	ROG	NOx	CO	SO2	PM10 Dust	PM10 Exhaust	PM10	PM2.5 Dust	PM2.5 Exhaust	PM2.5	CO2

Time Slice 6/1/2010-7/30/2010 Active Days: 44	**0.56**	**5.53**	**1.77**	0.00	16.17	**0.19**	16.37	3.38	**0.18**	3.56	605.69
Fine Grading 06/01/2010-07/30/2010	0.56	5.53	1.77	0.00	16.17	0.19	16.37	3.38	0.18	3.56	605.69
Fine Grading Dust	0.00	0.00	0.00	0.00	16.17	0.00	16.17	3.38	0.00	3.38	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.02	0.29	0.10	0.00	0.00	0.01	0.01	0.00	0.01	0.01	40.26
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/19/2010-8/20/2010 Active Days: 2	0.54	5.24	1.67	0.00	3.43	0.18	3.61	0.72	0.17	0.88	565.43
Fine Grading 08/19/2010-08/21/2010	0.54	5.24	1.67	0.00	3.43	0.18	3.61	0.72	0.17	0.88	565.43
Fine Grading Dust	0.00	0.00	0.00	0.00	3.42	0.00	3.42	0.72	0.00	0.72	0.00
Fine Grading Off Road Diesel	0.53	5.23	1.40	0.00	0.00	0.18	0.18	0.00	0.17	0.17	539.89
Fine Grading On Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Worker Trips	0.01	0.02	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	25.54
Time Slice 8/23/2010-8/25/2010 Active Days: 3	0.30	4.54	1.53	**0.01**	0.02	0.17	0.20	0.01	0.16	0.17	**628.06**
Fine Grading 08/22/2010-08/25/2010	0.30	4.54	1.53	0.01	0.02	0.17	0.20	0.01	0.16	0.17	628.06
Fine Grading Dust	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading Off Road Diesel	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Fine Grading On Road Diesel	0.30	4.54	1.53	0.01	0.02	0.17	0.20	0.01	0.16	0.17	628.06
Fine Grading Worker Trips	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Construction Related Mitigation Measures

The following mitigation measures apply to Phase: Fine Grading 6/1/2010 - 7/30/2010 - Trenching - Remaining

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

10/27/2008 12:22:08 PM

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/19/2010 - 8/21/2010 - Jack and Bore Crossing

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

The following mitigation measures apply to Phase: Fine Grading 8/22/2010 - 8/25/2010 - Pipe Hauling

For Soil Stablizing Measures, the Apply soil stabilizers to inactive areas mitigation reduces emissions by:

PM10: 84% PM25: 84%

For Soil Stablizing Measures, the Water exposed surfaces 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

For Unpaved Roads Measures, the Reduce speed on unpaved roads to less than 15 mph mitigation reduces emissions by:

PM10: 44% PM25: 44%

For Unpaved Roads Measures, the Manage haul road dust 3x daily watering mitigation reduces emissions by:

PM10: 61% PM25: 61%

D-6: Proposed Project Greenhouse Gas Calculations

Line 406 CO2 Emissions

Trenching Emissions

Trenching

Equipment	Max HP	Multiplier	Total lbs CO2
Environmental, Fence & Pot Hole Crew (60 days)			
Pump	250	417	110.99
Off-Highway Truck	250	321	229.23
			340.22
Grade Crew (18 Days)			
Crawler Tractor	250	811	650.23
Tractors/Loaders/Backhoes	250	77	53.36
Grader	250	86	65.63
			769.22
Ditch Crew (18 Days)			
Tractors/Loaders/Backhoes	250	1936	1,333.92
Trencher	250	106	99.22
			1,433.13
Stringing Crew (18 Days)			
Tractors/Loaders/Backhoes	250	77	53.36
Other Material Handling Equipment	250	83	61.40
Other Material Handling Equipment	500	1329	982.40
Crawler Tractor	250	90	72.25
			1,169.40
Bending Crew (18 Days)			
Other Material Handling Equipment	250	332	245.60
Other Material Handling Equipment	120	83	61.40
			307.00
Pipe Gang (Bead Welders) (18 Days)			
Other Material Handling Equipment	250	83	61.40
Crawler Tractor	250	90	72.25
Other Material Handling Equipment	250	83	61.40
Off-Highway Truck	250	80	57.31
Welder	15	4055	2,285.96
			2,538.32
Joint Coating Crew (18 Days)			
Other Material Handling Equipment	250	83	61.40
Air Compressor	15	68	40.64
			102.04
Lower-in Crew (18 Days)			
Other Material Handling Equipment	250	748	552.60
Tractors/Loaders/Backhoes	250	77	53.36
Rubber Tired Dozer	250	76	56.20
Tractors/Loaders/Backhoes	250	77	53.36
			715.51
Tie-In Crew (30 Days)			
Other Material Handling Equipment	250	1495	1,105.20
Tractors/Loaders/Backhoes	250	155	106.71
Rubber Tired Dozer	250	152	112.39
			1,324.30

Line 406 CO2 Emissions

Hydro-Test Crew (39 Days)			
Air Compressor	15	676	406.39
Other Material Handling Equipment	250	208	153.50
Pumps	15	1042	965.89
Pumps	15	260	241.47
			1,767.25
Clean Up Crew (24 Days)			
Rubber Tired Dozer	250	1026	758.65
Tractors/Loaders/Backhoes	250	465	320.14
Grader	250	129	98.45
Tractors/Loaders/Backhoes	175	116	80.04
Off-Highway Truck	500	120	85.96
			1,343.24

	2009
	CO2
Environmental Crew	340.22
All 18-Day Crews	7,034.62
Tie-In Crew	1,324.30
Hydro Test Crew	1,767.25
Clean Up Crew	1,343.24
Total	11,809.63

HDD			
Equipment	**Max HP**	**Multiplier**	**CO2**
	500	90,000.00	84,569.87
Bore/Drill Rigs	750	140,625.00	132,140.42
Cranes	250	4,506.40	2,427.79
Excavator	250	4,514.40	3,223.94
Off-Highway	250	51,300.00	36,635.66
Other Material Handling Equipment	250	21,948.00	16,224.02
			275,221.69

J/B			
Equipment	**Max HP**	**Multiplier**	**CO2**
Bore/Drill Rigs	120	7,200.00	6,765.59
Excavator	250	18,057.60	12,895.75
Other Material Handling Equipment	250	29,264.00	21,632.03
			41,293.37

Line 407E CO2 Emissions

Trenching			Total lbs
Equipment	**Max HP**	**Multiplier**	
Environmental, Fence & Pot Hole Crew (60 days)			**CO2**
Pump	250	309	286.33
Off-Highway Truck	250	238	169.88
			456.22
Grade Crew (18 Days)			
Crawler Tractor	250	601	481.89
Tractors/Loaders/Backhoes	250	57	39.54
Grader	250	64	48.64
			570.07
Ditch Crew (18 Days)			
Tractors/Loaders/Backhoes	250	1435	988.58
Trencher	250	78	73.53
			1,062.11
Stringing Crew (18 Days)			
Tractors/Loaders/Backhoes	250	57	39.54
Other Material Handling Equipment	250	62	45.50
Other Material Handling Equipment	500	985	728.06
Crawler Tractor	250	67	53.54
			866.65
Bending Crew (18 Days)			
Other Material Handling Equipment	250	246	182.02
Other Material Handling Equipment	120	62	45.50
			227.52
Pipe Gang (Bead Welders) (18 Days)			
Other Material Handling Equipment	250	62	45.50
Crawler Tractor	250	67	53.54
Other Material Handling Equipment	250	62	45.50
Off-Highway Truck	250	59	42.47
Welder	15	3005	1,694.14
			1,881.17
Joint Coating Crew (18 Days)			
Other Material Handling Equipment	250	62	45.50
Air Compressor	15	50	30.12
			75.62
Lower-in Crew (18 Days)			
Other Material Handling Equipment	250	554	409.54
Tractors/Loaders/Backhoes	250	57	39.54
Rubber Tired Dozer	250	56	41.65
Tractors/Loaders/Backhoes	250	57	39.54
			530.27
Tie-In Crew (30 Days)			
Other Material Handling Equipment	250	1108	819.07
Tractors/Loaders/Backhoes	250	115	79.09
Rubber Tired Dozer	250	113	83.30
			981.45
Hydro-Test Crew (39 Days)			
Air Compressor	15	501	301.18

Line 407E CO2 Emissions

Other Material Handling Equipment	250	154	113.76
Pumps	15	772	715.83
Pumps	15	193	178.96
			1,309.73
Clean Up Crew (24 Days)			
Rubber Tired Dozer	250	761	562.24
Tractors/Loaders/Backhoes	250	344	237.26
Grader	250	95	72.96
Tractors/Loaders/Backhoes	175	86	59.31
Off-Highway Truck	500	89	63.71
			995.49

	2010
	CO2
Environmental Crew	456.22
All 18-Day Crews	5,213.41
Tie-In Crew	981.45
Hydro Test Crew	1,309.73
Clean Up Crew	995.49
Total	8,956.29

HDD

Equipment	**Max HP**	**Multiplier**	**CO2**
	500	225,000.00	211,424.67
Bore/Drill Rigs	750	351,562.50	330,351.05
Cranes	250	11,266.00	6,069.47
Excavator	250	11,286.00	8,059.84
Off-Highway	250	128,250.00	91,589.14
Other Material Handling Equipment	250	54,870.00	40,560.05
			688,054.22

J/B

Equipment	**Max HP**	**Multiplier**	**CO2**
Bore/Drill Rigs	120	9,900.00	9,302.69
Excavator	250	24,829.20	17,731.66
Other Material Handling Equipment	250	40,238.00	29,744.04
			56,778.38

DFM CO2 Emissions

Trenching Emissions

Trenching			Total lbs
Equipment	**Max HP**	**Multiplier**	2010
Environmental, Fence & Pot Hole Crew	**(60 days)**		**CO2**
Pump	250	71	65.59
Off-Highway Truck	250	54	38.91
			104.50
Grade Crew (18 Days)			
Crawler Tractor	250	138	110.38
Tractors/Loaders/Backhoes	250	13	9.06
Grader	250	15	11.14
			130.58
Ditch Crew (18 Days)			
Tractors/Loaders/Backhoes	250	329	226.44
Trencher	250	18	16.84
			243.29
Stringing Crew (18 Days)			
Tractors/Loaders/Backhoes	250	13	9.06
Other Material Handling Equipment	250	14	10.42
Other Material Handling Equipment	500	226	166.77
Crawler Tractor	250	15	12.26
			198.52
Bending Crew (18 Days)			
Other Material Handling Equipment	250	56	41.69
Other Material Handling Equipment	120	14	10.42
			52.12
Pipe Gang (Bead Welders) (18 Days)			
Other Material Handling Equipment	250	14	10.42
Crawler Tractor	250	15	12.26
Other Material Handling Equipment	250	14	10.42
Off-Highway Truck	250	14	9.73
Welder	15	688	388.06
			430.90
Joint Coating Crew (18 Days)			
Other Material Handling Equipment	250	14	10.42
Air Compressor	15	11	6.90
			17.32
Lower-in Crew (18 Days)			
Other Material Handling Equipment	250	127	93.81
Tractors/Loaders/Backhoes	250	13	9.06
Rubber Tired Dozer	250	13	9.54
Tractors/Loaders/Backhoes	250	13	9.06
			121.46
Tie-In Crew (30 Days)			
Other Material Handling Equipment	250	254	187.62
Tractors/Loaders/Backhoes	250	26	18.12
Rubber Tired Dozer	250	26	19.08
			224.81

DFM CO2 Emissions

Hydro-Test Crew (39 Days)			
Air Compressor	15	115	68.99
Other Material Handling Equipment	250	35	26.06
Pumps	15	177	163.97
Pumps	15	44	40.99
			300.01
Clean Up Crew (24 Days)			
Rubber Tired Dozer	250	174	128.79
Tractors/Loaders/Backhoes	250	79	54.35
Grader	250	22	16.71
Tractors/Loaders/Backhoes	175	20	13.59
Off-Highway Truck	500	20	14.59
			228.03

	2010
	CO2
Environmental Crew	104.50
All 18-Day Crews	1,194.19
Tie-In Crew	224.81
Hydro Test Crew	300.01
Clean Up Crew	228.03
Total	2,051.54

HDD			
Equipment	**Max HP**	**Multiplier**	**CO2**
	500	45,000	42,284.93
Bore/Drill Rigs	750	70,313	66,070.21
Cranes	250	2,253	1,213.89
Excavator	250	2,257	1,611.97
Off-Highway	250	25,650	18,317.83
Other Material Handling Equipment	250	10,974	8,112.01
			137,610.84

J/B			
Equipment	**Max HP**	**Multiplier**	**CO2**
Bore/Drill Rigs	120	3,600	3,382.79
Excavator	250	9,029	6,447.88
Other Material Handling Equipment	250	14,632	10,816.01
			20,646.68

Line 407W CO2 Emissions

Equipment	Max HP	Multiplier		CO2
Environmental, Fence & Pot Hole Crew (60 days)				
Pump	250	406		376.86
Off-Highway Truck	250	313		223.60
				600.46
Grade Crew (18 Days)				
Crawler Tractor	250	791		634.25
Tractors/Loaders/Backhoes	250	76		52.05
Grader	250	84		64.02
				750.32
Ditch Crew (18 Days)				
Tractors/Loaders/Backhoes	250	1888		1,301.14
Trencher	250	103		96.78
				1,397.92
Stringing Crew (18 Days)				
Tractors/Loaders/Backhoes	250	76		52.05
Other Material Handling Equipment	250	81		59.89
Other Material Handling Equipment	500	1296		958.26
Crawler Tractor	250	88		70.47
				1,140.67
Bending Crew (18 Days)				
Other Material Handling Equipment	250	324		239.56
Other Material Handling Equipment	120	81		59.89
				299.46
Pipe Gang (Bead Welders) (18 Days)				
Other Material Handling Equipment	250	81		59.89
Crawler Tractor	250	88		70.47
Other Material Handling Equipment	250	81		59.89
Off-Highway Truck	250	78		55.90
Welder	15	3955		2,229.79
				2,475.94
Joint Coating Crew (18 Days)				
Other Material Handling Equipment	250	81		59.89
Air Compressor	15	66		39.64
				99.53
Lower-in Crew (18 Days)				
Other Material Handling Equipment	250	729		539.02
Tractors/Loaders/Backhoes	250	76		52.05
Rubber Tired Dozer	250	74		54.82
Tractors/Loaders/Backhoes	250	76		52.05
				697.93
Tie-In Crew (30 Days)				
Other Material Handling Equipment	250	1458		1,078.04
Tractors/Loaders/Backhoes	250	151		104.09
Rubber Tired Dozer	250	148		109.63
				1,291.76
Hydro-Test Crew (39 Days)				
Air Compressor	15	659		396.41
Other Material Handling Equipment	250	203		149.73

Line 407W CO2 Emissions

Pumps	15	1016	942.15
Pumps	15	254	235.54
			1,723.83
Clean Up Crew (24 Days)			
Rubber Tired Dozer	250	1001	740.01
Tractors/Loaders/Backhoes	250	453	312.27
Grader	250	126	96.03
Tractors/Loaders/Backhoes	175	113	78.07
Off-Highway Truck	500	117	83.85
			1,310.23

	2012
	CO2
Environmental Crew	600.46
All 18-Day Crews	6,861.76
Tie-In Crew	1,291.76
Hydro Test Crew	1,723.83
Clean Up Crew	1,310.23
Total	11,788.04

HDD

Equipment	**Max HP**	**Multiplier**	**CO2**
	500	180,000.00	169,139.74
Bore/Drill Rigs	750	281,250.00	264,280.84
Cranes	250	9,012.80	4,855.58
Excavator	250	9,028.80	6,447.88
Off-Highway	250	9,028.80	6,447.88
Other Material Handling Equipment	250	43,896.00	32,448.04
			483,619.94

J/B

Equipment	**Max HP**	**Multiplier**	**CO2**
Bore/Drill Rigs	120	8,100.00	7,611.29
Excavator	250	20,314.80	14,507.72
Other Material Handling Equipment	250	32,922.00	24,336.03
			46,455.04

D-7: Alternatives Greenhouse Gas Calculations

Trenching Construction Hours

Trenching Construction Timeline / Activity

Alternatives

Hours/Alterantive Difference

Equipment List by Phase	Horsepower	Hours Per Foot	HP Max	HP Min	HP Avg	Pipeline Route	A	B	C	D	E	F	G	H	I	J	K	L
Environmental, Fence & Pot Hole Crew (60 days)						Trench length	2,214	2,640	1,150	860	3,480.00	0	0	(2,943.00)	2,927.00	5,254.00	71.50	-1000
1 Vacuum Suck Pump (Other Equipment)	300-350	0.008	350	300	325		18	21	9	7	28	-	-	(24)	23	42	1	-8
1 Flatbed	200 -260	0.008	260	200	230		18	21	9	7	28	-	-	(24)	23	42	1	(8)
Grade Crew (18 Days)																		-
3 D-8 Dozers	230-300	0.002	300	230	265		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Cat Backhoe	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Motor Grader	240-350	0.002	350	240	295		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Ditch Crew (18 Days)																		
5 Backhoes	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Ditching Machine	150-250	0.002	250	150	200		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Stringing Crew (18 Days)																		
1 Cat Backhoe	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Cat Sideboom	310	0.002	310	310	310		4	5	2	2	7	-	-	(6)	6	11	0	(2)
4 Stringing Trucks	380-470	0.002	470	380	425		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Cat Dozer	230-300	0.002	300	230	265		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Bending Crew (18 Days)																		
2 Sidebooms	310	0.002	310	310	310		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Bending Machine	110	0.002	110	110	110		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Pipe Gang (Bead Welders) (18 Days)																		
1 Sideboom	310	0.002	310	310	310		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Tack Rig	200-250	0.002	250	200	225		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Tow Cat	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Skid Truck	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
8 Gas power welding units	18	0.002	18	18	18		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Joint Coating Crew (18 Days)																		
1 Sideboom	310	0.002	310	310	310		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Air Compressor	8	0.002	8	8	8		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Lower-in Crew (18 Days)																		
3 Sidebooms	310	0.002	310	310	310		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Backhoe	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Dozer	230-300	0.002	300	230	265		4	5	2	2	7	-	-	(6)	6	11	0	(2)
1 Backhoe w/ Clam attachment	200-300	0.002	300	200	250		4	5	2	2	7	-	-	(6)	6	11	0	(2)
Tie-In Crew (30 Days)																		
3 Sidebooms	310	0.004	310	310	310		9	11	5	3	14	-	-	(12)	12	21	0	(4)
1 Backhoe	200-300	0.004	300	200	250		9	11	5	3	14	-	-	(12)	12	21	0	(4)
1 Dozer	230-300	0.004	300	230	265		9	11	5	3	14	-	-	(12)	12	21	0	(4)
Hydro-Test Crew (39 Days)																		
2 Air Compressors	10	0.005	10	10	10		11	13	6	4	17	-	-	(15)	15	26	0	(5)
1 Cat Sideboom	310	0.005	310	310	310		11	13	6	4	17	-	-	(15)	15	26	0	(5)
2 Fill Pumps	8	0.005	8	8	8		11	13	6	4	17	-	-	(15)	15	26	0	(5)
1 Test Pump	8	0.005	8	8	8		11	13	6	4	17	-	-	(15)	15	26	0	(5)
Clean Up Crew (24 Days)																		-
3 Dozers	230-300	0.003	300	230	265		7	8	3	3	10	-	-	(9)	9	16	0	(3)
2 Backhoes	200-300	0.003	300	200	250		7	8	3	3	10	-	-	(9)	9	16	0	(3)
1 Motor Grader	250-350	0.003	350	250	300		7	8	3	3	10	-	-	(9)	9	16	0	(3)
1 Tractor	100-200	0.003	200	100	150		7	8	3	3	10	-	-	(9)	9	16	0	(3)
1 Dump Truck	300-400	0.003	400	300	350		7	8	3	3	10	-	-	(9)	9	16	0	(3)

HDD Hours

By Phase

Hours/Alterantive Difference

Equip Mix (including horsepower) Per HDD	Hours per Day	Days of Operation			Horse Power	No.	A	B	C	D	E	F	G	H	I	J	K	L
HDD Equipmnet List																		
Drill Rig	10	15			625		0	0	0	0	0	0	0	0	0	0	0	1
Mud Rig	10	15			400		0	0	0	0	0	0	0	0	0	0	0	150
Excavator	10	2			148 - 248		0	0	0	0	0	0	0	0	0	0	0	150
Dump Truck	10	15			300		0	0	0	0	0	0	0	0	0	0	0	20
Crane	10	2			262		0	0	0	0	0	0	0	0	0	0	0	150
Generator	10	15			15		0	0	0	0	0	0	0	0	0	0	0	20
3 Side Booms	10	2			310		0	0	0	0	0	0	0	0	0	0	0	150

Total Tons

Emissions Analysis

URB Equivalent		Equation Factors			Total Hours												Multiplier											
					2009					2012			2010				2009					2012			2010			
Equip	Max HP	No	HP	Load Factor	A	B	C	D	E	F	G	H	I	J	K	L	A	B	C	D	E	F	G	H	I	J	K	L
Pump	250	1	325	0.74	18	21	9	7	28	0	0	-24	23	42	1	-8	4260	5079	2213	1655	6696	0	0	-5662	5632	10109	138	-1924
Off-Highway Truck	250	1	230	0.57	18	21	9	7	28	0	0	-24	23	42	1	-8	2322	2769	1206	902	3650	0	0	-3087	3070	5510	75	-1049
Crawler Tractor	250	3	265	0.64	4	5	2	2	7	0	0	-6	6	11	0	-2	2253	2686	1170	875	3541	0	0	-2995	2979	5346	73	-1018
Tractors/Loaders/Backhoes	250	1	250	0.55	4	5	2	2	7	0	0	-6	6	11	0	-2	609	726	316	237	957	0	0	-809	805	1445	20	-275
Grader	250	1	295	0.61	4	5	2	2	7	0	0	-6	6	11	0	-2	797	950	414	310	1252	0	0	-1059	1053	1891	26	-360
Tractors/Loaders/Backhoes	250	5	250	0.55	4	5	2	2	7	0	0	-6	6	11	0	-2	3045	3630	1581	1183	4785	0	0	-4047	4025	7224	98	-1375
Trencher	250	1	200	0.75	4	5	2	2	7	0	0	-6	6	11	0	-2	664	792	345	258	1044	0	0	-883	878	1576	21	-300
Tractors/Loaders/Backhoes	250	1	250	0.55	4	5	2	2	7	0	0	-6	6	11	0	-2	609	726	316	237	957	0	0	-809	805	1445	20	-275
Other Material Handling Equipment	250	1	310	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	810	966	421	315	1273	0	0	-1077	1071	1922	26	-366
Other Material Handling Equipment	500	4	425	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	4442	5296	2307	1725	6981	0	0	-5904	5872	10540	143	-2006
Crawler Tractor	250	1	265	0.64	4	5	2	2	7	0	0	-6	6	11	0	-2	751	895	390	292	1180	0	0	-998	993	1782	24	-339
Other Material Handling Equipment	250	2	310	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	1620	1931	841	629	2546	0	0	-2153	2141	3844	52	-732
Other Material Handling Equipment	120	1	110	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	287	343	149	112	452	0	0	-382	380	682	9	-130
Other Material Handling Equipment	250	1	310	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	810	966	421	315	1273	0	0	-1077	1071	1922	26	-366
Crawler Tractor	250	1	225	0.64	4	5	2	2	7	0	0	-6	6	11	0	-2	638	760	331	248	1002	0	0	-848	843	1513	21	-288
Other Material Handling Equipment	250	1	250	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	653	779	339	254	1027	0	0	-868	863	1550	21	-295
Off-Highway Truck	250	1	250	0.57	4	5	2	2	7	0	0	-6	6	11	0	-2	631	752	328	245	992	0	0	-839	834	1497	20	-285
Welder	15	8	18	0.45	4	5	2	2	7	0	0	-6	6	11	0	-2	287	342	149	111	451	0	0	-381	379	681	9	-130
Other Material Handling Equipment	250	1	310	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	810	966	421	315	1273	0	0	-1077	1071	1922	26	-366
Air Compressor	15	1	8	0.48	4	5	2	2	7	0	0	-6	6	11	0	-2	17	20	9	7	27	0	0	-23	22	40	1	-8
Other Material Handling Equipment	250	3	310	0.59	4	5	2	2	7	0	0	-6	6	11	0	-2	2430	2897	1262	944	3819	0	0	-3230	3212	5766	78	-1097
Tractors/Loaders/Backhoes	250	1	250	0.55	4	5	2	2	7	0	0	-6	6	11	0	-2	609	726	316	237	957	0	0	-809	805	1445	20	-275
Rubber Tired Dozer	250	1	265	0.54	4	5	2	2	7	0	0	-6	6	11	0	-2	634	756	329	246	996	0	0	-842	838	1504	20	-286
Tractors/Loaders/Backhoes	250	1	250	0.55	4	5	2	2	7	0	0	-6	6	11	0	-2	609	726	316	237	957	0	0	-809	805	1445	20	-275
Other Material Handling Equipment	250	3	310	0.59	9	11	5	3	14	0	0	-12	12	21	0	-4	4860	5794	2524	1888	7638	0	0	-6459	6424	11531	157	-2195
Tractors/Loaders/Backhoes	250	1	250	0.55	9	11	5	3	14	0	0	-12	12	21	0	-4	1218	1452	633	473	1914	0	0	-1619	1610	2890	39	-550
Rubber Tired Dozer	250	1	265	0.54	9	11	5	3	14	0	0	-12	12	21	0	-4	1267	1511	658	492	1992	0	0	-1685	1675	3007	41	-572
Air Compressor	15	2	10	0.48	11	13	6	4	17	0	0	-15	15	26	0	-5	106	127	55	41	167	0	0	-141	140	252	3	-48
Other Material Handling Equipment	250	1	310	0.59	11	13	6	4	17	0	0	-15	15	26	0	-5	2025	2414	1052	786	3182	0	0	-2691	2677	4805	65	-915
Pumps	15	2	8	0.74	11	13	6	4	17	0	0	-15	15	26	0	-5	131	156	68	51	206	0	0	-174	173	311	4	-59
Pumps	15	1	8	0.74	11	13	6	4	17	0	0	-15	15	26	0	-5	66	78	34	25	103	0	0	-87	87	156	2	-30
Rubber Tired Dozer	250	3	265	0.54	7	8	3	3	10	0	0	-9	9	16	0	-3	2852	3400	1481	1108	4482	0	0	-3790	3770	6767	92	-1288
Tractors/Loaders/Backhoes	250	2	250	0.55	7	8	3	3	10	0	0	-9	9	16	0	-3	1827	2178	949	710	2871	0	0	-2428	2415	4335	59	-825
Grader	250	1	300	0.61	7	8	3	3	10	0	0	-9	9	16	0	-3	1216	1449	631	472	1911	0	0	-1616	1607	2884	39	-549
Tractors/Loaders/Backhoes	175	1	150	0.55	7	8	3	3	10	0	0	-9	9	16	0	-3	548	653	285	213	861	0	0	-728	724	1300	18	-248
Off-Highway Truck	500	1	350	0.57	7	8	3	3	10	0	0	-9	9	16	0	-3	1325	1580	688	515	2083	0	0	-1761	1752	3145	43	-599

Emissions Analysis

URB Equivalent		Equation Factors			Total Hours												Multiplier											
Equip	Max HP	No	HP	Load Factor	A	B	C	D	E	F	G	H	I	J	K	L	A	B	C	D	E	F	G	H	I	J	K	L
Bore / Drill Rig	750	1	625	0.75	0	0	0	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	70313
Bore / Drill Rig	500	1	400	0.75	0	0	0	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	45000
Excavator	250	1	198	0.57	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	2257
Off-Highway Truck	250	1	300	0.57	0	0	0	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	25650
Crane	250	1	262	0.43	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	2253
Generator	15	2	15	0.74	0	0	0	0	0	0	0	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0	0	3330
Other Material Handling Equipment	250	3	310	0.59	0	0	0	0	0	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0	0	0	10974

Off-Road Calcs

Multiplier

Equipment	Max HP	2009 A	2009 B	2009 C	2009 D	2009 E	2009 F	2009 G	2012 H	2012 I	2012 J	2010 K	2010 L	
Environmental, Fence & Pot Hole Crew (60 days)														
Pump	250	4260	5079	2213	1655	6696	0	0	-5662	5632	10109	138	-1924	
Off-Highway Truck	250	2322	2769	1206	902	3650	0	0	-3087	3070	5510	75	-1049	
Grade Crew (18 Days)														
Crawler Tractor	250	2253	2686	1170	875	3541	0	0	-2995	2979	5346	73	-1018	
Tractors/Loaders/Backhoes	250	609	726	316	237	957	0	0	-809	805	1445	20	-275	
Grader	250	797	950	414	310	1252	0	0	-1059	1053	1891	26	-360	
Ditch Crew (18 Days)														
Tractors/Loaders/Backhoes	250	3045	3630	1581	1183	4785	0	0	-4047	4025	7224	98	-1375	
Trencher	250	664	792	345	258	1044	0	0	-883	878	1576	21	-300	
Stringing Crew (18 Days)														
Tractors/Loaders/Backhoes	250	609	726	316	237	957	0	0	-809	805	1445	20	-275	
Other Material Handling Equipment	250	810	966	421	315	1273	0	0	-1077	1071	1922	26	-366	
Other Material Handling Equipment	500	4442	5296	2307	1725	6981	0	0	-5904	5872	10540	143	-2006	
Crawler Tractor	250	751	895	390	292	1180	0	0	-998	993	1782	24	-339	
Bending Crew (18 Days)														
Other Material Handling Equipment	250	1620	1931	841	629	2546	0	0	-2153	2141	3844	52	-732	
Other Material Handling Equipment	120	287	343	149	112	452	0	0	-382	380	682	9	-130	
Pipe Gang (Bead Welders) (18 Days)														
Other Material Handling Equipment	250	810	966	421	315	1273	0	0	-1077	1071	1922	26	-366	
Crawler Tractor	250	638	760	331	248	1002	0	0	-848	843	1513	21	-288	
Other Material Handling Equipment	250	653	779	339	254	1027	0	0	-868	863	1550	21	-295	
Off-Highway Truck	250	631	752	328	245	992	0	0	-839	834	1497	20	-285	
Welder	15	287	342	149	111	451	0	0	-381	379	681	9	-130	
Joint Coating Crew (18 Days)														
Other Material Handling Equipment	250	810	966	421	315	1273	0	0	-1077	1071	1922	26	-366	
Air Compressor	15	17	20	9	7	27	0	0	-23	22	40	1	-8	
Lower-in Crew (18 Days)														
Other Material Handling Equipment	250	2430	2897	1262	944	3819	0	0	-3230	3212	5766	78	-1097	
Tractors/Loaders/Backhoes	250	609	726	316	237	957	0	0	-809	805	1445	20	-275	
Rubber Tired Dozer	250	634	756	329	246	996	0	0	-842	838	1504	20	-286	
Tractors/Loaders/Backhoes	250	609	726	316	237	957	0	0	-809	805	1445	20	-275	
Tie-In Crew (30 Days)														
Other Material Handling Equipment	250	4860	5794	2524	1888	7638	0	0	-6459	6424	11531	157	-2195	
Tractors/Loaders/Backhoes	250	1218	1452	633	473	1914	0	0	-1619	1610	2890	39	-550	
Rubber Tired Dozer	250	1267	1511	658	492	1992	0	0	-1685	1675	3007	41	-572	
Hydro-Test Crew (39 Days)														
Air Compressor	15	106	127	55	41	167	0	0	-141	140	252	3	-48	
Other Material Handling Equipment	250	2025	2414	1052	786	3182	0	0	-2691	2677	4805	65	-915	
Pumps	15	131	156	68	51	206	0	0	-174	173	311	4	-59	
Pumps	15	66	78	34	25	103	0	0	-87	87	156	2	-30	
Clean Up Crew (24 Days)														
Rubber Tired Dozer	250	2852	3400	1481	1108	4482	0	0	-3790	3770	6767	92	-1288	
Tractors/Loaders/Backhoes	250	1827	2178	949	710	2871	0	0	-2428	2415	4335	59	-825	
Grader	250	1216	1449	631	472	1911	0	0	-1616	1607	2884	39	-549	
Tractors/Loaders/Backhoes	175	548	653	285	213	861	0	0	-728	724	1300	18	-248	
Off-Highway Truck	500	1325	1580	688	515	2083	0	0	-1761	1752	3145	43	-599	
												Total Lbs		
												Total Tons		

Total Lbs

Equipment	Max HP	2009 A	2009 B	2009 C	2009 D	2009 E	2009 F	2009 G	2012 H	2012 I	2012 J	2010 K	2010 L
Environmental, Fence & Pot Hole Crew (60 days)													
Pump	250	1,134.69	1,352.86	589.31	440.70	6,207.66	-	-	(5,249.76)	5,221.21	9,372.14	127.54	(1,783.81)
Off-Highway Truck	250	1,658.48	1,977.35	861.35	644.14	2,606.50	-	-	(2,204.29)	2,192.31	3,935.22	53.55	(749.00)
Grade Crew (18 Days)													
Crawler Tractor	250	1,806.76	2,154.14	938.35	701.73	2,839.54	-	-	(2,401.37)	2,388.32	4,287.06	58.34	(815.96)
Tractors/Loaders/Backhoes	250	419.60	500.28	217.92	162.97	659.46	-	-	(557.70)	554.66	995.63	13.55	(189.50)
Grader	250	609.05	726.15	316.32	236.55	957.20	-	-	(809.49)	805.09	1,445.15	19.67	(275.06)
Ditch Crew (18 Days)													
Tractors/Loaders/Backhoes	250	2,098.01	2,501.39	1,089.62	814.85	3,297.29	-	-	(2,788.48)	2,773.32	4,978.14	67.75	(947.50)
Trencher	250	624.20	744.21	324.18	242.43	981.01	-	-	(829.63)	825.12	1,481.10	20.16	(281.90)
Stringing Crew (18 Days)													
Tractors/Loaders/Backhoes	250	419.60	500.28	217.92	162.97	659.46	-	-	(557.70)	554.66	995.63	13.55	(189.50)
Other Material Handling Equipment	250	598.74	713.86	310.96	232.54	940.99	-	-	(795.79)	791.46	1,420.68	19.33	(270.40)
Other Material Handling Equipment	500	3,283.41	3,914.70	1,705.27	1,275.24	5,160.28	-	-	(4,364.00)	4,340.27	7,790.84	106.02	(1,482.84)
Crawler Tractor	250	602.25	718.05	312.78	233.91	946.51	-	-	(800.46)	796.11	1,429.02	19.45	(271.99)
Bending Crew (18 Days)													
Other Material Handling Equipment	250	1,197.48	1,427.71	621.92	465.09	1,881.99	-	-	(1,591.58)	1,582.92	2,841.37	38.67	(540.80)
Other Material Handling Equipment	120	212.46	253.30	110.34	82.52	333.90	-	-	(282.38)	280.84	504.11	6.86	(95.95)
Pipe Gang (Bead Welders) (18 Days)													
Other Material Handling Equipment	250	598.74	713.86	310.96	232.54	940.99	-	-	(795.79)	791.46	1,420.68	19.33	(270.40)
Crawler Tractor	250	511.35	609.66	265.57	198.60	803.64	-	-	(679.63)	675.94	1,213.32	16.51	(230.93)
Other Material Handling Equipment	250	482.85	575.69	250.77	187.54	758.87	-	-	(641.76)	638.28	1,145.71	15.59	(218.06)
Off-Highway Truck	250	450.67	537.32	234.06	175.04	708.29	-	-	(598.99)	595.74	1,069.35	14.55	(203.53)
Welder	15	161.79	192.90	84.03	62.84	254.28	-	-	(215.04)	213.87	383.90	5.22	(73.07)
Joint Coating Crew (18 Days)													
Other Material Handling Equipment	250	598.74	713.86	310.96	232.54	940.99	-	-	(795.79)	791.46	1,420.68	19.33	(270.40)
Air Compressor	15	10.23	12.19	5.31	3.97	16.07	-	-	(13.59)	13.52	24.27	0.33	(4.62)
Lower-in Crew (18 Days)													
Other Material Handling Equipment	250	1,796.22	2,141.57	932.88	697.63	2,822.98	-	-	(2,387.36)	2,374.39	4,262.05	58.00	(811.20)
Tractors/Loaders/Backhoes	250	419.60	500.28	217.92	162.97	659.46	-	-	(557.70)	554.66	995.63	13.55	(189.50)
Rubber Tired Dozer	250	468.45	558.52	243.29	181.94	736.23	-	-	(622.62)	619.24	1,111.54	15.13	(211.56)
Tractors/Loaders/Backhoes	250	419.60	500.28	217.92	162.97	659.46	-	-	(557.70)	554.66	995.63	13.55	(189.50)
Tie-In Crew (30 Days)													
Other Material Handling Equipment	250	3,592.44	4,283.14	1,865.76	1,395.27	5,645.96	-	-	(4,774.73)	4,748.77	8,524.10	116.00	(1,622.40)
Tractors/Loaders/Backhoes	250	839.20	1,000.56	435.85	325.94	1,318.91	-	-	(1,115.39)	1,109.33	1,991.26	27.10	(379.00)
Rubber Tired Dozer	250	936.90	1,117.04	486.59	363.88	1,472.46	-	-	(1,245.24)	1,238.47	2,223.07	30.25	(423.12)
Hydro-Test Crew (39 Days)													
Air Compressor	15	63.92	76.21	33.20	24.83	100.46	-	-	(84.95)	84.49	151.66	2.06	(28.87)
Other Material Handling Equipment	250	1,496.85	1,784.64	777.40	581.36	2,352.48	-	-	(1,989.47)	1,978.65	3,551.71	48.33	(676.00)
Pumps	15	121.53	144.90	63.12	47.20	191.00	-	-	(161.53)	160.65	288.37	3.92	(54.89)
Pumps	15	60.77	72.45	31.56	23.60	95.50	-	-	(80.77)	80.33	144.19	1.96	(27.44)
Clean Up Crew (24 Days)													
Rubber Tired Dozer	250	2,108.03	2,513.33	1,094.82	818.74	3,313.03	-	-	(2,801.79)	2,786.56	5,001.91	68.07	(952.02)
Tractors/Loaders/Backhoes	250	1,258.81	1,500.83	653.77	488.91	1,978.37	-	-	(1,673.09)	1,663.99	2,986.89	40.65	(568.50)
Grader	250	929.06	1,107.69	482.52	360.84	1,460.13	-	-	(1,234.82)	1,228.11	2,204.47	30.00	(419.58)
Tractors/Loaders/Backhoes	175	377.64	450.25	196.13	146.67	593.51	-	-	(501.93)	499.20	896.07	12.19	(170.55)
Off-Highway Truck	500	946.41	1,128.38	491.53	367.58	1,487.41	-	-	(1,257.89)	1,251.05	2,245.64	30.56	(427.42)
		33,314.54	39,719.81	17,302.19	12,939.03	56,782.28	-	-	(48,020.19)	47,759.12	85,728.20	1,166.65	(16,316.75)
		16.66	19.86	8.65	6.47	28.39	-	-	(24.01)	23.88	42.86	0.58	(8.16)

HDD

Equipment	Max HP	2009 A	2009 B	2009 C	2009 D	2009 E	2009 F	2009 G	2012 H	2012 I	2012 J	2010 K	2010 L	
	500												70313	
Bore/Drill Rigs	750												45000	
Cranes	250												2257	
Excavator	250												25650	
Off-Highway Trucks	250												2253	
Generators	15												3330	
Other Material Handling Equipment	250												10974	

Total Lbs

Equipment	Max HP	2009 A	2009 B	2009 C	2009 D	2009 E	2009 F	2009 G	2012 H	2012 I	2012 J	2010 K	2010 L	
	500	-	-	-	-	-	-	-	-	-	-	-	66,070.21	
Bore/Drill Rigs	750	-	-	-	-	-	-	-	-	-	-	-	42,284.93	
Cranes	250	-	-	-	-	-	-	-	-	-	-	-	1,216.05	
Excavator	250	-	-	-	-	-	-	-	-	-	-	-	18,317.83	
Off-Highway Trucks	250	-	-	-	-	-	-	-	-	-	-	-	1,609.11	
Generators	15	-	-	-	-	-	-	-	-	-	-	-	3,087.36	
Other Material Handling Equipment	250	-	-	-	-	-	-	-	-	-	-	-	8,112.01	
												Total lbs	140,697.51	
												Total Tons	70.35	
												Difference	62.19	