APPENDIX B

Recommendations for Snow Plowing on Native Surface Roads

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Recommendations for snow plowing on native surface roads

Compiled by Erin Lutrick, Inyo National Forest Hydrologist, August 2012

The following is the "Snow Removal and Storage" Best Management Practice (BMP) (12.21 Exhibit 09, BMP 2.9) from the Soil and Water Conservation Handbook, Chapter 10, Water Quality Management Handbook (R5 FSH 2509.22), modified to be specific to the CD-4 access roads that will be plowed for year-round access. In this location, there is no surface water or riparian areas, so erosion of the roads and adjacent undisturbed lands are the focus of these recommendations.

Objective: Prevent or reduce erosion, sedimentation, and chemical pollution that may result from snow removal and storage activities.

Explanation: Forest roads and parking areas are sometimes used in areas that receive snow. Snow removal from these facilities may adversely affect water; aquatic, and riparian resources in several ways. Plowing may physically displace native or engineered surfaces on roads, damage drainage structures, or alter drainage patterns. Plowing may also remove protective soil cover (for example, vegetation and mulch). Further, when snow begins to melt, water can preferentially run down the road because snow berms prevent it from draining off of the road. These changes can result in concentrated flow, increased erosion, and a greater risk of sediment delivery to water bodies.

Snow piled in large heaps or in sensitive areas may contribute to increased run-off, hill slope erosion, and mass slope instability. Additionally, both snow removal and storage may result in additions of nutrients or fine aggregates used for de-icing or traction control directly to surface water and indirectly to both surface water and groundwater during runoff.

Sale administrators, contracting officer's representatives, engineering representatives, inspectors, permit administrators, and force account crew supervisors are responsible for implementing snow removal and storage operations. The line officer is responsible for approving and assuring implementation of the snow removal plan, and the winter road maintenance plan. The risk from snow removal and storage can be managed by using the appropriate techniques from the following list adapted as needed to local site conditions.

Implementation:

Road construction and improvement

1. Where roads are currently incised below the surrounding ground surface, they must be built up to allow for proper road drainage, to allow for outsloping, crowning, or insloping to carry water off of the road surface. Otherwise, snowmelt will concentrate on the road and lead to muddy areas and road surface degradation because the road cannot drain. Designs must be submitted to the Forest Engineers and Watershed specialists for approval.

2. For roads that run through topographic low spots, such as swales or bowls, the road will need to be constructed as a causeway, with large rocks under the road base, and geotextile fabric between the ground surface and rocks, and between the rocks and road base, to allow for water to flow freely under the road without saturating the road fill.

3. Roads should be outsloped where possible, and where topography allows. Where not possible or practical, roads should be crowned. If neither outsloping or crowning is possible, inside ditches, regularly maintained, and with sufficient sized culverts, may be used. In any of these cases, roads will be re-graded to their specified configuration/slope every spring after snowmelt, so that they continue to function as designed.

4. Roads must be constructed with rolling dips where possible, to allow for drainage off of the road surface. The rolling dip outlet may need to be armored if it discharges onto a slope, particularly a fill slope. Approximate location of rolling dips must be pre-planned and design submitted to the Forest Engineers and Watershed Specialists.

Road Maintenance

1. When re-grading roads each spring, care must be taken to keep them at their designed grade, and not lower the road grade or create berms that affect runoff. This will take more time than simply flattening the road with a grader, and may require importing fill, although proper maintenance should retain most of the existing road material and very little should be lost annually. Outsloping, crowning, or insloping must be maintained as designed.

2. Conduct frequent inspections at the earliest possible opportunity during snowmelt to ensure road drainage is not adversely affecting soil or water resources.

Snow removal practices

1. Snow to be left on road:

   If roads are plowed with loaders, bulldozers, or snowcats, at least two feet of snow must be left on the road. The remaining snow should be removed with a snowblower to avoid scraping the road surface. At least one foot of snow should remain on the road after all snow removal, even after blowing, to protect the road surface. Those needing to access the well sites will likely need to chain up to drive the roads, even after snow removal.

2. Snow Storage:

   a. Plowed snow piles should be stored in relatively flat areas. This can usually be just off of the roadway or in pull outs. However, in the case of low lying areas, where the road is below the surrounding grade or runs through a swale or other low point, and subject to

collecting water, all plowed snow should be pushed out of the low spot and to an area where it will flow away from the low spot when it melts.

b. Portions of the road will likely have fill when they are constructed for proper drainage. Snow should not be piled (stored) on top of or directly adjacent to a fill slope.

c. Keep snow piles away from culverts, major rolling dips, ditches, or other drainage features. These features must be marked in advance so that the plow/snow blower operator knows where they are when snow is deep. Use of a snow blower will reduce the size of piles. It is important to clear these features before major snowmelt so that runoff can drain properly rather than remaining on the road and destabilizing the road surface and associated fill.

3. Retaining Road Drainage Features:

   When plowing, construct regular openings in berms as needed to allow for road drainage over major rolling dips or other drainage features. Install snow berms where such placement will preclude concentration of snowmelt runoff and will serve to rapidly dissipate melt water. During spring snowmelt, the proponent will likely need to clean out culverts, rolling dips, waterbars, and ditches to allow for snowmelt to drain through the designed drainage features. Mark drainage structures to avoid damage during plowing.

4. Limit use of approved deicing and traction-control materials, but do not compromise in areas where safety is critical (intersections and approaches, steep segments, corners).

5. Modify snow removal procedures as necessary to meet erosion concerns.

6. If erosion on the roads or surrounding areas continues after implementation of BMPs, pave the entire road or portions of the road.

APPENDIX C

Air Quality and GHG

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C.1 Air Pollutant Emission Estimates

1a. Construction Emissions Summaries

Maximum Day Construction Emissions

	Maximum Day Emissions (pounds/day)					
Emissions Source	**ROG**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Power Plant Construction Offroad Equipment	3	32	27	0	2	2
Power Plant Construction Onroad Vehicle	3	20	63	0	1	1
Power Plant Construction Exhaust Subtotal	7	53	90	0	3	2
Well Construction Offroad Equipment	11	206	118	0	7	6
Well Construction Onroad Vehicle	3	44	26	0	2	1
Well Construction Exhaust Subtotal	14	251	144	0	8	8
Pipeline Construction Offroad Equipment	3	32	28	0	2	2
Pipeline Construction Onroad Vehicle	2	8	31	0	0	0
Pipeline Construction Subtotal	5	40	59	0	2	2
Total Fugitive Dust	---	---	---	---	85	12
Total (maximum pounds/day)	**25**	**343**	**292**	**1**	**98**	**24**

Maximum Annual Construction Emissions

	Maximum Annual Emissions (tons/year)					
Emissions Source	**ROG**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Power Plant Construction Offroad Equipment	0	2	1	0	0	0
Power Plant Construction Onroad Vehicle	0	2	6	0	0	0
Power Plant Construction Subtotal	1	4	7	0	0	0
Well Construction Offroad Equipment	1	11	7	0	0	0
Well Construction Onroad Vehicle	0	3	2	0	0	0
Well Construction Subtotal	1	14	9	0	1	0
Pipeline Construction Offroad Equipment	0	1	1	0	0	0
Pipeline Construction Onroad Vehicle	0	1	2	0	0	0
Pipeline Construction Subtotal	0	2	3	0	0	0
Total Fugitive Dust	---	---	---	---	4	1
Total (maximum tons/year)	**2**	**20**	**19**	**0**	**5**	**1**

1b. Operation and Maintenance Emissions Summaries

Maximum Day Operation and Maintenance Emissions

	Maximum Day Emissions (pounds/day)					
Emissions Source	**ROG**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Power Power Plant Fugitive n-pentane	410.0	---	---	---	---	---
Off-site Vehicle Emissions	0.1	0.6	2.5	0.0	0.0	0.0
Emergency Generator and Firewater Pump*	0.1	7.9	1.2	0.8	0.2	0.2
Total (maximum pounds/day)	**410.2**	**8.5**	**3.7**	**0.8**	**0.2**	**0.2**

*Obtained from Mono County, 2012.

Annual Operation and Maintenance Emissions

	Annual Emissions (tons/year)					
Emissions Source	**ROG**	**NOx**	**CO**	**SO2**	**PM10**	**PM2.5**
Power Power Plant Fugitive n-pentane	74.8	---	---	---	---	---
Off-site Vehicle Emissions	0.0	0.1	0.4	0.0	0.0	0.0
Emergency Generator and Firewater Pump*	0.0	0.2	0.0	0.0	0.0	0.0
Total (maximum tons/year)	**74.8**	**0.3**	**0.4**	**0.0**	**0.0**	**0.0**

*Obtained from Mono County, 2012.

2. Offroad Construction Equipment Inventory

Onsite Equipment Usage for Power Plant Construction

Equipment (hp)	No.	hrs/ day	For Each Phase wks	days	annual hrs	max day hrs	P 1 and II total hrs*
Excavator (157 hp)	1	8	4	24	192	8	384
Grader (162 hp)	1	8	4	24	192	8	384
Loader (87 hp)	2	7	28	168	2,352	14	4704
Backhoe (75 hp)	1	8	4	24	192	8	384
Crane (208 hp)	1	7	28	168	1,176	0	2352
Concrete Mixer (9 hp)	2	6	28	168	2,016	0	4032
Drill Rig (82 hp)	1	8	4	24	192	8	384
Roller Compactor (84 hp)	1	8	4	24	192	8	384
Generator (84 hp)	1	8	28	168	1,344	0	2688

*It is assumed that the construction emissions for Phases I and II would be approximately the same.

Onsite Equipment Usage for Well Development

Equipment (hp)	No.	hrs/ day	Each Well Site wks	days	annual hrs	max day hrs	Maximum Day* hrs/day	Max Annual hrs** hrs/year	Total hrs*** hrs
Excavator (157 hp)	1	8	4	24	192	0	0	1,152	2,688
Grader (162 hp)	1	8	4	24	192	0	0	1,152	2,688
Loader (87 hp)	2	7	4	24	336	0	0	2,016	4,704
Backhoe (75 hp)	1	8	4	24	192	0	0	1,152	2,688
Drill Rig - Unit No. 1 (1,354 hp)	2	5	4	30	150	5	10	900	2,100
Drill Rig - Unit No. 2 (1,354 hp)	2	5	4	30	150	5	10	900	2,100
Drill Rig - Unit No. 3 (1,354 hp)	2	5	4	30	150	5	10	900	2,100
Drill Rig - Unit No. 4 (197 hp)	2	1	4	30	30	1	2	180	420

*The maximum day for well development assumes simultaneous drilling of two wells.

**The maximum annual emissions assume that 6 wells would be drilled per year.

***The total hours assume that 14 wells would be drilled.

Onsite Equipment Usage for Pipeline

Equipment (hp)	No.	hrs/ day	2013* wks	days	annual hrs	max day hrs	2014** weeks	days	annual hrs	2015*** weeks	days	annual hrs	Total hrs hrs
Crane (208 hp)	1	7	24	144	1,008	7	4	24	168	2	12	84	1,260
Backhoe Loader (87 hp)	2	8	24	144	2,304	16	4	24	384	2	12	192	2,880
Fork Lift (149 hp)	1	8	24	144	1,152	8	4	24	192	2	12	96	1,440
Excavator (157 hp)	1	8	2	12	96	8	0	0	0	0	0	0	96
Loader (87 hp)	1	7	2	12	84	7	0	0	0	0	0	0	84
Jack and Bore Rig (164 hp)	1	8	2	12	96	8	0	0	0	0	0	0	96

*It is assumed that the main pipelines, including the Highway 395 crossings, would be constructed in 2013.

**It is assumed that pipeline construction in 2014 would be limited to the pipeline segments associated with 6 well sites.

**It is assumed that pipeline construction in 2015 would be limited to the pipeline segments associated with 2 well sites.

Notes: Equipment types and weeks of use are based on the Project Description; equipment amounts, horsepower, hours per day, and total weeks of activity were obtained from SCAQMD, 2011, CalEEMond User's Manual Appendix D - Default Data Tables. It is assumed that the equipment would operate 5 days each week. Total hours for all well sites combined is estimated by multiplying the equipment total hours for each well site by six to represent the six well sites.

3. Maximum Day Offroad Construction Exhaust Emissions

Off-road Construction Equipment Emission Factors

Equipment	Offroad HP Range	Equipment Emission Rates (lb/hour)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Excavator (157 hp)	120-175	0.055	0.627	0.666	0.001	0.031	0.029
Grader (162 hp)	120-175	0.120	1.178	0.734	0.001	0.066	0.061
Loader (87 hp)	50-120	0.066	0.516	0.415	0.001	0.045	0.042
Backhoe (75 hp)	50-120	0.044	0.396	0.353	0.001	0.032	0.029
Crane (208 hp)	175-250	0.099	1.125	0.294	0.001	0.052	0.048
Concrete Mixer (9 hp)	0-50	0.108	0.258	0.081	0.000	0.030	0.028
Drill Rig (82 hp)	50-120	0.033	0.413	0.469	0.001	0.025	0.023
Roller Compactor (84 hp)	50-120	0.056	0.489	0.406	0.001	0.037	0.034
Generator (84 hp)	50-120	0.059	0.511	0.527	0.001	0.040	0.037
Backhoe Loader (87 hp)	50-120	0.066	0.516	0.415	0.001	0.045	0.042
Fork Lift (149 hp)	120-175	0.030	0.458	0.725	0.001	0.018	0.017
Jack and Bore Rig (164 hp)	120-175	0.055	0.710	0.753	0.002	0.033	0.030
Drill Rig - Unit No. 1 (1,354 hp)	>1,000	0.360	6.840	3.900	0.009	0.225	0.207
Drill Rig - Unit No. 2 (1,354 hp)	>1,000	0.360	6.840	3.900	0.009	0.225	0.207
Drill Rig - Unit No. 3 (1,354 hp)	>1,000	0.360	6.840	3.900	0.009	0.225	0.207
Drill Rig - Unit No. 4 (197 hp)	175-250	0.033	0.622	0.567	0.002	0.033	0.030

Notes: ROG, NOx, CO, and PM10 emission factors for Drill Rig Units 1 -4 are based on Tier 2 standards with revised CARB load factors (see Table 9, Tier 2 Emission Factors). PM10 and PM2.5 emissions are based on PM emissions with PM10 and PM2.5 fractions applied to the PM EF (SCAQMD, 2006). All other emission rates were derived using Offroad2011 and Offroad2007 (for CO and Sox only

References:

SCAQMD (South Coast Air Quality Management District). 2006. Final Methodology to Calculate PM2.5 and PM2.5 Significance Thresholds, Appendix A - Updated CEIDARS Table with PM2.5 Fractions

Maximum Day Onsite Power Plant Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (pounds/day)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Excavator (157 hp)	8	0.44	5.02	5.33	0.01	0.25	0.23
Grader (162 hp)	8	0.96	9.43	5.87	0.01	0.53	0.49
Loader (87 hp)	14	0.92	7.22	5.81	0.01	0.63	0.58
Backhoe (75 hp)	8	0.35	3.17	2.82	0.00	0.25	0.23
Crane (208 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Concrete Mixer (9 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Drill Rig (82 hp)	8	0.27	3.30	3.75	0.01	0.20	0.19
Roller Compactor (84 hp)	8	0.45	3.91	3.25	0.01	0.29	0.27
Generator (84 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day) =		**3.38**	**32.05**	**26.83**	**0.05**	**2.16**	**1.99**

Maximum Annual Onsite Power Plant Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (tons/year; 2013)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Excavator (157 hp)	192	0.01	0.06	0.06	0.00	0.00	0.00
Grader (162 hp)	192	0.01	0.11	0.07	0.00	0.01	0.00
Loader (87 hp)	2,352	0.08	0.61	0.49	0.00	0.05	0.00
Backhoe (75 hp)	192	0.00	0.04	0.03	0.00	0.00	0.00
Crane (208 hp)	1,176	0.06	0.66	0.17	0.00	0.03	0.00
Concrete Mixer (9 hp)	2,016	0.11	0.26	0.08	0.00	0.03	0.00
Drill Rig (82 hp)	192	0.00	0.04	0.05	0.00	0.00	0.00
Roller Compactor (84 hp)	192	0.01	0.05	0.04	0.00	0.00	0.00
Generator (84 hp)	1,344	0.04	0.34	0.35	0.00	0.03	0.00
Maximum (tons/year) =		**0.31**	**2.17**	**1.35**	**0.00**	**0.16**	**0.00**

Maximum Day Onsite Well Development Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (pounds/day)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Excavator (157 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Grader (162 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Loader (87 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Backhoe (75 hp)	0	0.00	0.00	0.00	0.00	0.00	0.00
Drill Rig - Unit No. 1 (1,354 hp)	10	3.60	68.40	39.00	0.09	2.25	2.07
Drill Rig - Unit No. 2 (1,354 hp)	10	3.60	68.40	39.00	0.09	2.25	2.07
Drill Rig - Unit No. 3 (1,354 hp)	10	3.60	68.40	39.00	0.09	2.25	2.07
Drill Rig - Unit No. 4 (197 hp)	2	0.07	1.24	1.13	0.00	0.07	0.06
Maximum (pounds/day) =		**10.87**	**206.44**	**118.13**	**0.28**	**6.82**	**6.27**

Maximum Annual Onsite Well Development Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (tons/year; 2013)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Excavator (157 hp)	1,152	0.03	0.36	0.38	0.00	0.02	0.02
Grader (162 hp)	1,152	0.07	0.68	0.42	0.00	0.04	0.04
Loader (87 hp)	2,016	0.07	0.52	0.42	0.00	0.05	0.04
Backhoe (75 hp)	1,152	0.03	0.23	0.20	0.00	0.02	0.02
Drill Rig - Unit No. 1 (1,354 hp)	900	0.16	3.08	1.75	0.00	0.10	0.09
Drill Rig - Unit No. 2 (1,354 hp)	900	0.16	3.08	1.75	0.00	0.10	0.09
Drill Rig - Unit No. 3 (1,354 hp)	900	0.16	3.08	1.75	0.00	0.10	0.09
Drill Rig - Unit No. 4 (197 hp)	180	0.00	0.06	0.05	0.00	0.00	0.00
Maximum (tons/year) =		**0.68**	**11.08**	**6.74**	**0.02**	**0.43**	**0.39**

Maximum Day Onsite Pipeline Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (pounds/day)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Crane (208 hp)	7	0.69	7.87	2.06	0.01	0.36	0.33
Backhoe Loader (87 hp)	16	0.70	6.33	5.64	0.01	0.50	0.46
Fork Lift (149 hp)	8	0.24	3.66	5.80	0.01	0.14	0.13
Excavator (157 hp)	8	0.44	5.02	5.33	0.01	0.25	0.23
Loader (87 hp)	7	0.46	3.61	2.90	0.00	0.32	0.29
Jack and Bore Rig (164 hp)	8	0.44	5.68	6.02	0.01	0.26	0.24
Maximum (pounds/day) =		**2.97**	**32.17**	**27.76**	**0.06**	**1.84**	**1.69**

Maximum Annual Onsite Pipeline Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (tons/year; 2013)					
		ROG	NOx	CO	SOx	PM10	PM2.5
Crane (208 hp)	1,008	0.05	0.57	0.15	0.00	0.03	0.02
Backhoe Loader (87 hp)	2,304	0.05	0.46	0.41	0.00	0.04	0.03
Fork Lift (149 hp)	1,152	0.02	0.26	0.42	0.00	0.01	0.01
Excavator (157 hp)	96	0.00	0.03	0.03	0.00	0.00	0.00
Loader (87 hp)	84	0.00	0.02	0.02	0.00	0.00	0.00
Jack and Bore Rig (164 hp)	96	0.00	0.02	0.04	0.00	0.00	0.00
Maximum (tons/year) =		**0.13**	**1.36**	**1.06**	**0.00**	**0.08**	**0.07**

4. Construction Onroad Criteria Pollutant Emissions

Emission Factors

Vehicle Type	Units	Running Exhaust Emission Factors					
		ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck (LDT1 gas)*	g/mile	0.3900	8.9920	0.8900	0.0040	0.0080	0.0070
Light duty truck (LDT1 gas)	lb/mile	0.0009	0.0198	0.0020	0.0000	0.0000	0.0000
Heavy duty truck (T7 diesel)*	g/mile	0.4810	2.1790	8.8120	0.0170	0.3070	0.2820
Heavy duty truck (T7 diesel)	lb/mile	0.0011	0.0048	0.0194	0.0000	0.0007	0.0006

* Emission factor obtained online from EMFAC 2011, for Mono County, average model years, and average spee

Power Plant Construction - Worker and Material Delivery Trips

Vehicle Type	Trips/day	miles/trip	ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck	300	10	2.58	59.47	5.89	0.03	0.05	0.05
Heavy duty truck	30	25	0.80	3.60	14.57	0.03	0.51	0.47
Maximim Day Emissions (lbs/day)			**3.37**	**63.08**	**20.46**	**0.05**	**0.56**	**0.51**
Annual Emissions (tons/year)			**0.32**	**6.06**	**1.96**	**0.01**	**0.05**	**0.05**

Well Development Construction - Worker and Material Delivery Trips

Vehicle Type	Trips/day	miles/trip	ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck	76	10	0.65	15.07	1.49	0.01	0.01	0.01
Heavy duty truck	88	25	2.33	10.57	42.74	0.08	1.49	1.37
Maximim Day Emissions (lbs/day)			**2.99**	**25.63**	**44.23**	**0.09**	**1.50**	**1.38**
Annual Emissions (tons/year)			**0.22**	**1.85**	**3.18**	**0.01**	**0.11**	**0.10**

Pipeline Construction - Worker and Material Delivery Trips

Vehicle Type	Trips/day	miles/trip	ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck	150	10	1.29	29.74	2.94	0.01	0.03	0.02
Heavy duty truck	10	25	0.27	1.20	4.86	0.01	0.17	0.16
Maximim Day Emissions (lbs/day)			**1.55**	**30.94**	**7.80**	**0.02**	**0.20**	**0.18**
Annual Emissions (tons/year)			**0.11**	**2.23**	**0.56**	**0.00**	**0.01**	**0.01**

All trips per day are one-way trips obtained from Table 4.16-1.
The light-duty truck trips represent construction worker commute trips. Heavy duty truck trips represent material and fill haul trips
Annual emissions are estimated by multiplying the maximum day emissions by the workdays (6 workdays per week)

5. Fugitive Dust Emissions

Fugitive dust from Soil Disturbance

Construction Source	Area Disturbed (acres/day) [1]	Area Disturbed days/year [2]	Emission Factor (pounds/acre) [3] PM10	Emissions (pounds/day) PM10	Emissions (pounds/day) PM2.5 [4]	Emissions (tons/year) PM10	Emissions (tons/year) PM2.5 [4]
Power Plant	2.00	24.00	10.00	20.00	4.16	0.24	0.05
Well Development	1.00	24.00	10.00	10.00	2.08	0.12	0.02
Pipeline Construction	0.50	144.00	10.00	5.00	1.04	0.36	0.07
			Total	35.00	7.28	0.72	0.15

[1] It is assumed that up to 2, 1, and 0.5 acres per day would be disturbed during power plant, well development, and pipeline construction, respectively.

[2] Soil disturbance would occur for one month (24 days) at the power plant and well sites, and for six months related to pipeline construction (63 days).

[3] The Midwest Research Institute has derived a value of 0.11 tons/acre/month, which converts to 10 pounds per acre per day, assuming 22 workdays per month. The California Air Resources Board review has reviewed this factor and concluded that it represents PM10 emissions with watering. (CARB, 2002; http://www.arb.ca.gov/ei/areasrc/fullpdf/full7-7.pdf)

[4] PM2.5 fractions for soil disturbance and earth moving were obtained from SCAQMD, 2006.

Unpaved Road Fugitive Dust from Trucks

VMT [1] (miles/day)	days/year	Emission Factors (pounds/VMT) [2] PM10	Emission Factors (pounds/VMT) [2] PM2.5	Emissions (pounds/day) PM10	Emissions (pounds/day) PM2.5	Emissions (tons/year) PM10	Emissions (tons/year) PM2.5
162	144	1.2	0.1	197.7	19.8	14.2	1.4
	Controlled (water twice/day and 25 mph speed limit)			49.8	5.0	3.6	0.4
			Control Efficiency	74.8	74.8	74.8	74.8

[1] Assumes that each trip associated with well development and pipeline construction (see table below) would include one half mile travel on unpaved roads.

[2] Based on AP-42 Emission Factor (USEPA, 2006): E (lbs/VMT) = k (s/12)^a (W/3)^b

Where:

E = emission rate in pounds per vehicle mile traveled

k = particle size multiplier (assumed 1.5 lb/VMT for PM10 and 0.15 lb/VMT for PM2.5 per AP-42, Table 13.2.2-2)

a = 0.9

b = 0.45

s = silt content (assumed 5.1% for a plant road site per AP-42, Table 13.2.2-1)

W = average weight (tons) of vehicles (assumed 5.9 tons; 70% small trucks weigh 2 tons, 30% trucks weigh 30 tons) associated with pipeline and well site development

Unpaved Road Trips Summary

Trips Source	Light duty trucks	Heavy trucks	percent or ave. weight
Well Development	76	88	
Pipeline Construction	150	10	
Total	226	98	
Grand Total		324	
Percentage	**% 2 tons**	**0.697530864**	1.395061728
Percentage	**%30 tons**	**0.302469136**	9.074074074
Average Weight (W)			10.4691358

Total Controlled Fugitive Dust

	lbs/day		tons/year	
Construction Source	**PM10**	**PM2.5**	**PM10**	**PM2.5**
Total Project	84.82	12.26	4.31	0.51

6. Operation and Maintenance

Onroad Criteria Pollutant Emissions

Emission Factors

Vehicle Type	Units	Running Exhaust Emission Factors					
		ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck (LDT1 gas)*	g/mile	0.3900	8.9920	0.8900	0.0040	0.0080	0.0070
Light duty truck (LDT1 gas)	lb/mile	0.0009	0.0198	0.0020	0.0000	0.0000	0.0000
Heavy duty truck (T7 diesel)*	g/mile	0.4810	2.1790	8.8120	0.0170	0.3070	0.2820
Heavy duty truck (T7 diesel)	lb/mile	0.0011	0.0048	0.0194	0.0000	0.0007	0.0006

* Emission factor obtained online from EMFAC 2011, for Mono County, average model years, and average speed.

Worker and Material Delivery Trips

Vehicle Type	Trips/day	miles/trip	ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck	12	10	0.10	2.38	0.24	0.00	0.00	0.00
Heavy duty truck	1	20	0.02	0.10	0.39	0.00	0.01	0.01
Maximim Day Emissions (lbs/day)			**0.12**	**2.47**	**0.62**	**0.00**	**0.02**	**0.01**

Vehicle Type	Trips/year	miles/trip	ROG	CO	NOx	SO2	PM10	PM2.5
Light duty truck	4,380	10	0.02	0.43	0.04	0.00	0.00	0.00
Heavy duty truck	40	20	0.00	0.00	0.01	0.00	0.00	0.00
Maximim Annual Emissions (ton/year)			**0.02**	**0.44**	**0.05**	**0.00**	**0.00**	**0.00**

All trips per day are one-way trips.

The light-duty truck trips represent employee commute trips. Heavy duty truck trips represent road plowing event (2 per week for 5 months)

Fugitive N-Pentane

Emission Source	lbs/day*	tons/year
Fugitive n-pentane	410	74.825

* Obtained from Section 2, description of the Proposed Action

7. Offroad2011 Output

Calendar Year	AirBasin	Equipment Class	Equipment Type ID	Equipment Type	Horse power Bin	BaseBSFC (pounds/yr)	FC (liter/hr)	BaseNOx	NOx (lb/hr)	BasePM	PM (lb/hour)	BaseHC	HC (lb/hr)	Base Activity (hr/yr)	Scen Activity	Population
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	50	132.629384	4.455621725	0.00188098	0.23683866	0.00013755	0.01731907	0.00024456	0.03079279	15.8840722	15.8840722	0.05029321
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	120	799.827225	7.822972277	0.01125956	0.41275915	0.00069368	0.02542926	0.00072121	0.02643865	54.5575432	54.5575432	0.15405605
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	175	944.597175	14.84910471	0.01205044	0.7099966	0.0005588	0.03292406	0.00074079	0.04364649	33.9450761	33.9450761	0.12070371
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	250	1337.85469	20.38707155	0.01629999	0.93096389	0.00050418	0.02879568	0.00081012	0.04626971	35.0174495	35.0174495	0.12017431
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	500	1482.10272	33.60623457	0.01594049	1.35469903	0.00052454	0.04457814	0.00082613	0.07020885	23.5336268	23.5336268	0.08417495
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	750	2042.43167	61.20442071	0.01555171	1.74667825	0.00052979	0.05950324	0.00080755	0.09069977	17.8071804	17.8071804	0.04182278
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	1000	160.93776	90.54059885	0.00167379	3.52928861	3.9578E-05	0.08345146	5.3767E-05	0.11336999	0.94851675	0.94851675	0.00158821
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	9999	544.625396	262.4226254	0.00690924	12.4776636	0.00016552	0.29892245	0.00022046	0.39813861	1.10745739	1.10745739	0.00158821
2013	GBV	Construction and Mining	12	Cranes	50	42.9338213	2.515894727	0.0007177	0.15762831	7.1707E-05	0.01574899	0.00020772	0.04562128	9.10620647	9.10620647	0.02329603
2013	GBV	Construction and Mining	12	Cranes	120	1024.06214	4.993552462	0.03258066	0.5954465	0.00241325	0.04410472	0.00326049	0.0595889	109.432698	109.432698	0.28088351
2013	GBV	Construction and Mining	12	Cranes	175	2703.50713	8.393163206	0.07130176	0.82965585	0.0038472	0.04476538	0.00550898	0.06410164	171.882739	171.882739	0.42132526
2013	GBV	Construction and Mining	12	Cranes	250	4565.36719	12.26886299	0.11164573	1.12452811	0.00512886	0.05165936	0.00772921	0.07785087	198.564593	198.564593	0.47324212
2013	GBV	Construction and Mining	12	Cranes	500	6991.70936	18.95928364	0.13728006	1.39522936	0.00569361	0.05786627	0.00867782	0.08819599	196.784939	196.784939	0.4539397
2013	GBV	Construction and Mining	12	Cranes	750	1843.51667	31.94557626	0.02422505	1.57335955	0.00083345	0.05413051	0.00126201	0.08196454	30.7940461	30.7940461	0.06656007
2013	GBV	Construction and Mining	12	Cranes	1000	431.401727	52.58734771	0.01512433	6.90995487	0.00074925	0.34231577	0.0011199	0.5116568	4.3775491	4.3775491	0.00998401
2013	GBV	Construction and Mining	12	Cranes	9999	33.227182	58.11349039	0.00065125	4.26902081	1.5847E-05	0.1038786	2.7896E-05	0.18286084	0.30510334	0.30510334	0.0006656
2013	GBV	Construction and Mining	13	Crawler Tractors	50	130.81781	3.900419898	0.00231206	0.25837023	0.00027062	0.03024123	0.00076441	0.08542248	17.8972343	17.8972343	0.05907552
2013	GBV	Construction and Mining	13	Crawler Tractors	120	5798.69583	7.370706198	0.13197319	0.62872981	0.01097501	0.05228572	0.01279505	0.06095656	419.8089	419.8089	1.01668974
2013	GBV	Construction and Mining	13	Crawler Tractors	175	6306.9677	12.55200153	0.13367336	0.99709566	0.00722979	0.0539284	0.01003814	0.07487644	268.125449	268.125449	0.66519038
2013	GBV	Construction and Mining	13	Crawler Tractors	250	6363.79041	17.08212702	0.12179298	1.22531548	0.00473129	0.04759983	0.00728829	0.07332487	198.794486	198.794486	0.48619155
2013	GBV	Construction and Mining	13	Crawler Tractors	500	17068.9753	28.84378064	0.29834339	1.8895602	0.01152533	0.07299575	0.01785628	0.11309291	315.78077	315.78077	0.78156916
2013	GBV	Construction and Mining	13	Crawler Tractors	750	6639.77192	47.99621327	0.10168875	2.75502972	0.00365384	0.09899272	0.00579829	0.15709177	73.820435	73.820435	0.16009467
2013	GBV	Construction and Mining	13	Crawler Tractors	1000	878.300743	69.98629996	0.01936237	5.78266257	0.00056705	0.16935284	0.00102104	0.30493893	6.6966967	6.6966967	0.01417813
2013	GBV	Construction and Mining	13	Crawler Tractors	9999	464.308325	123.1812091	0.00870273	8.65352587	0.00022689	0.22561102	0.00039817	0.39591676	2.0113721	2.0113721	0.00354453
2013	GBV	Construction and Mining	14	Excavators	50	5238.2946	2.976417842	0.07142463	0.15210784	0.00556071	0.01184223	0.0097851	0.0208386	939.131556	939.131556	1.44689745
2013	GBV	Construction and Mining	14	Excavators	120	6800.5909	6.051060106	0.11097363	0.37008731	0.00835603	0.02786664	0.00917349	0.03059278	599.715946	599.715946	1.04652796
2013	GBV	Construction and Mining	14	Excavators	175	14326.9617	10.92686733	0.21938095	0.6271047	0.01093226	0.03125008	0.01509379	0.04314589	699.662898	699.662898	1.32962947
2013	GBV	Construction and Mining	14	Excavators	250	18227.8154	16.36074429	0.27300949	0.91842938	0.00877678	0.0295259	0.01481969	0.04985482	594.513851	594.513851	1.14306676
2013	GBV	Construction and Mining	14	Excavators	500	30238.2962	24.50723236	0.34345832	1.04330329	0.01117384	0.03394212	0.01893507	0.05751795	658.405518	658.405518	1.16261142
2013	GBV	Construction and Mining	14	Excavators	750	2733.90653	42.80220812	0.03362718	1.97320654	0.00110694	0.06495415	0.00182517	0.10709878	34.0837916	34.0837916	0.05922626
2013	GBV	Construction and Mining	14	Excavators	1000	306.851855	62.8145822	0.00634119	4.86521332	0.00020487	0.15718454	0.00033603	0.25781819	2.60674585	2.60674585	0.0047381
2013	GBV	Construction and Mining	14	Excavators	9999	598.303719	116.234019	0.00729298	5.3102666	0.0002015	0.14672251	0.0003344	0.24349001	2.74674828	2.74674828	0.00414584
2013	GBV	Construction and Mining	15	Graders	50	34.5929525	3.270657966	0.00065437	0.2318841	8.7072E-05	0.03085487	0.00025743	0.09122501	5.64394684	5.64394684	0.01845368
2013	GBV	Construction and Mining	15	Graders	120	935.116778	7.273411945	0.02880737	0.8397993	0.0023889	0.0696419	0.00302501	0.08818585	68.6053647	68.6053647	0.19644244
2013	GBV	Construction and Mining	15	Graders	175	8685.88924	12.10897464	0.22552062	1.17836251	0.01264069	0.06604858	0.01808666	0.09450419	382.769505	382.769505	0.91911251
2013	GBV	Construction and Mining	15	Graders	250	15071.42	16.53836916	0.25727109	1.05810576	0.00828106	0.03405838	0.01417384	0.05829424	486.286154	486.286154	0.72981343
2013	GBV	Construction and Mining	15	Graders	500	4297.76034	23.50084446	0.04784786	0.98062601	0.00182179	0.03733695	0.00321891	0.06597039	97.5863645	97.5863645	0.13631915
2013	GBV	Construction and Mining	15	Graders	1000	41.5524289	63.71096499	0.00115973	6.66461399	4.0361E-05	0.23194298	7.3182E-05	0.42055444	0.34802677	0.34802677	0.00059528
2013	GBV	Construction and Mining	15	Graders	9999	585.35262	159.2113649	0.0115005	11.7239185	0.00034517	0.35187314	0.00062485	0.63698494	1.96188666	1.96188666	0.0029764
2013	GBV	Construction and Mining	16	Off-Highway Tractors	50	2164.19315	3.562259802	0.03390881	0.20919037	0.00344469	0.02125102	0.00836013	0.05157537	324.190915	324.190915	0.55422268
2013	GBV	Construction and Mining	16	Off-Highway Tractors	120	2770.47208	6.414184185	0.05680998	0.4929602	0.0047231	0.04098396	0.00533276	0.0462742	230.485052	230.485052	0.40296486
2013	GBV	Construction and Mining	16	Off-Highway Tractors	175	2359.99679	13.51709534	0.03832734	0.82277342	0.00198613	0.04263636	0.00267255	0.05737159	93.1662142	93.1662142	0.15300984
2013	GBV	Construction and Mining	16	Off-Highway Tractors	250	1977.53834	18.17854282	0.03649315	1.25731774	0.00130802	0.04506588	0.00210855	0.07264704	58.0492027	58.0492027	0.0998652
2013	GBV	Construction and Mining	16	Off-Highway Tractors	500	5586.19806	28.52191073	0.07450981	1.42585484	0.00267461	0.05118251	0.00425232	0.08137448	104.512474	104.512474	0.17169807
2013	GBV	Construction and Mining	16	Off-Highway Tractors	750	1407.31733	49.09373588	0.01909988	2.49726353	0.00067536	0.08830106	0.00106801	0.13964028	15.2966513	15.2966513	0.0251123
2013	GBV	Construction and Mining	16	Off-Highway Tractors	1000	39.7643736	85.28735326	0.00146574	11.7827774	7.4573E-05	0.59947929	0.00010247	0.823731	0.24879401	0.24879401	0.00058401
2013	GBV	Construction and Mining	16	Off-Highway Tractors	9999	310.075939	143.2340943	0.0092943	16.0914226	0.00034957	0.60522267	0.00061344	1.06205667	1.15518642	1.15518642	0.00233603
2013	GBV	Construction and Mining	17	Off-Highway Trucks	50	207.0882	2.346321463	0.00333583	0.14165615	0.00034659	0.01471787	0.00078271	0.03323792	47.0975433	47.0975433	0.03298396
2013	GBV	Construction and Mining	17	Off-Highway Trucks	120	254.312388	6.41977601	0.00559577	0.52943422	0.00045071	0.04264302	0.00056355	0.05331897	21.1386893	21.1386893	0.01851731
2013	GBV	Construction and Mining	17	Off-Highway Trucks	175	4920.2522	11.83193362	0.08583419	0.773621	0.00490059	0.0441689	0.00692467	0.06241186	221.902428	221.902428	0.17707178
2013	GBV	Construction and Mining	17	Off-Highway Trucks	250	10092.8055	15.67990629	0.18769026	1.09288102	0.00818566	0.04766339	0.01345046	0.07831919	343.477943	343.477943	0.30322096
2013	GBV	Construction and Mining	17	Off-Highway Trucks	500	42890.2159	28.07981061	0.65221334	1.60038768	0.02543301	0.062407	0.04498649	0.11038693	815.06918	815.06918	0.67356718
2013	GBV	Construction and Mining	17	Off-Highway Trucks	750	15411.1437	49.60659679	0.2922414	3.52570434	0.012535	0.15122668	0.02078719	0.2507841	165.777601	165.777601	0.15392515
2013	GBV	Construction and Mining	17	Off-Highway Trucks	1000	10664.4786	67.27576451	0.22022299	5.20692419	0.00655735	0.15504108	0.01204964	0.28490019	84.5885146	84.5885146	0.07059725
2013	GBV	Construction and Mining	17	Off-Highway Trucks	9999	15357.1994	133.3633757	0.28765543	9.36260524	0.00922694	0.30031843	0.01701219	0.55371267	61.447732	61.447732	0.04571461
2013	GBV	Construction and Mining	18	Other Construction Equipment	50	1173.0864	3.464555449	0.01762026	0.19504257	0.00160041	0.01771535	0.00343241	0.03799412	180.681172	180.681172	0.42799367
2013	GBV	Construction and Mining	18	Other Construction Equipment	120	3664.40755	6.614087286	0.07559261	0.51138159	0.0058842	0.03980642	0.00686841	0.04646456	295.640727	295.640727	0.75518129
2013	GBV	Construction and Mining	18	Other Construction Equipment	175	1998.64688	12.35057801	0.04038332	0.93530401	0.00212878	0.04930402	0.00296924	0.06876956	86.353352	86.353352	0.23502209
2013	GBV	Construction and Mining	18	Other Construction Equipment	250	2567.64518	17.7914945	0.04828464	1.25396674	0.00184442	0.04790019	0.00283479	0.07362029	77.0110406	77.0110406	0.21082864
2013	GBV	Construction and Mining	18	Other Construction Equipment	500	8785.78562	29.36064138	0.13565857	1.69915016	0.00515557	0.06457457	0.00807993	0.10120268	159.678144	159.678144	0.40956056
2013	GBV	Construction and Mining	18	Other Construction Equipment	750	3411.67439	48.69529263	0.04531111	2.4239504	0.00153208	0.08195972	0.00242584	0.12977207	37.3861728	37.3861728	0.08467708
2013	GBV	Construction and Mining	18	Other Construction Equipment	1000	398.05402	67.4298423	0.00594059	3.77172008	0.00016231	0.10305168	0.00026143	0.16598643	3.15007057	3.15007057	0.00748845
2013	GBV	Construction and Mining	18	Other Construction Equipment	9999	247.091303	89.32839828	0.00503944	6.82832784	0.0001668	0.22600614	0.00027508	0.37272189	1.47604068	1.47604068	0.00345621

Calendar Year	AirBasin	Equipment Class	Equipment Type ID	Equipment Type	Horse power Bin	BaseBSFC (pounds/yr)	FC (liter/hr)	BaseNOx	NOx (lb/hr)	BasePM	PM (lb/hour)	BaseHC	HC (lb/hr)	Base Activity (hr/yr)	Scen Activity	Population
2013	GBV	Construction and Mining	19	Pavers	50	143.739185	3.51100379	0.00225704	0.20663118	0.00023381	0.02140495	0.00061062	0.05590152	21.8461189	21.8461189	0.06937073
2013	GBV	Construction and Mining	19	Pavers	120	1389.5678	6.4410681	0.02706553	0.47021269	0.00210632	0.0365933	0.00247162	0.04293975	115.120393	115.120393	0.33702615
2013	GBV	Construction and Mining	19	Pavers	175	1888.46684	12.87513726	0.03450248	0.88164234	0.00173145	0.04424389	0.00249432	0.0637373	78.2686619	78.2686619	0.22776724
2013	GBV	Construction and Mining	19	Pavers	250	1275.24342	17.4208662	0.01614542	0.8266574	0.00040566	0.02077015	0.00065126	0.03334489	39.0619357	39.0619357	0.09827521
2013	GBV	Construction and Mining	19	Pavers	500	480.572913	26.37485393	0.00494764	1.0177195	0.00017126	0.03522858	0.00024589	0.05057824	9.72298551	9.72298551	0.02427976
2013	GBV	Construction and Mining	19	Pavers	750	55.5335657	61.01326041	0.00040389	1.66316369	1.7106E-05	0.07044107	2.1853E-05	0.08998669	0.48569288	0.48569288	0.00115618
2013	GBV	Construction and Mining	20	Paving Equipment	50	178.688963	2.669372622	0.00259033	0.14503268	0.00022643	0.01267776	0.0004603	0.0257725	35.7206159	35.7206159	0.08541965
2013	GBV	Construction and Mining	20	Paving Equipment	120	811.914564	6.179960324	0.0162587	0.46383213	0.00123911	0.03534951	0.00143637	0.04097724	70.105979	70.105979	0.17430226
2013	GBV	Construction and Mining	20	Paving Equipment	175	764.825394	10.28872802	0.01291291	0.65106315	0.00062408	0.03146608	0.00085163	0.04293878	39.6671525	39.6671525	0.09523137
2013	GBV	Construction and Mining	20	Paving Equipment	250	401.181012	15.00455335	0.00689348	0.96631977	0.00025521	0.0357749	0.00039228	0.0549897	14.2674944	14.2674944	0.03462959
2013	GBV	Construction and Mining	20	Paving Equipment	500	565.76557	23.40695605	0.00820781	1.27272675	0.00029311	0.04544987	0.00045368	0.0703495	12.8979886	12.8979886	0.03116663
2013	GBV	Construction and Mining	20	Paving Equipment	750	268.281161	42.08682722	0.0031573	1.85639976	7.1844E-05	0.04224211	0.00014037	0.08253556	3.40153077	3.40153077	0.00750308
2013	GBV	Construction and Mining	20	Paving Equipment	1000	52.4642361	58.62525993	0.00117776	4.93260669	3.4059E-05	0.14264232	6.3827E-05	0.26731675	0.47753915	0.47753915	0.00115432
2013	GBV	Construction and Mining	21	Rollers	50	2949.0204	2.922402438	0.04373549	0.16244106	0.00397898	0.01477862	0.00884028	0.03283432	538.478253	538.478253	1.75259363
2013	GBV	Construction and Mining	21	Rollers	120	4609.14743	6.413097826	0.09377738	0.48904063	0.00700892	0.0365509	0.00845332	0.04408329	383.515701	383.515701	1.30701898
2013	GBV	Construction and Mining	21	Rollers	175	4760.89882	10.5607629	0.0737989	0.61355824	0.00344278	0.02862303	0.00471169	0.0391726	240.560365	240.560365	0.75569461
2013	GBV	Construction and Mining	21	Rollers	250	751.542757	15.70390756	0.01338415	1.04820097	0.00047914	0.03752426	0.00077476	0.06067641	25.5373822	25.5373822	0.09267953
2013	GBV	Construction and Mining	21	Rollers	500	473.573917	24.86693974	0.00843141	1.65933627	0.00034723	0.06833551	0.00052442	0.10320838	10.1623897	10.1623897	0.03802237
2013	GBV	Construction and Mining	21	Rollers	750	23.1359399	38.3028594	0.0005946	3.68952231	2.2026E-05	0.13667127	3.5033E-05	0.21737902	0.32231934	0.32231934	0.0011882
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	50	150.166535	4.145494908	0.00216298	0.22379768	0.00018372	0.0190094	0.00040143	0.0415347	19.3297922	19.3297922	0.079602
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	120	12077.9528	7.593355959	0.17901099	0.42181275	0.01087783	0.02563198	0.01189268	0.02802332	848.769923	848.769923	3.41053389
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	175	2220.668	10.19133174	0.02662071	0.45789558	0.00105305	0.01811321	0.00136239	0.02343402	116.274133	116.274133	0.45633904
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	250	182.77542	16.44614611	0.00347638	1.17239249	0.00015337	0.05172387	0.00023357	0.07876936	5.93040098	5.93040098	0.02676274
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	500	77.3990236	29.15285687	0.00108447	1.530951	3.3003E-05	0.04659002	5.4579E-05	0.07705035	1.41672245	1.41672245	0.00617602
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	750	12.1103316	49.20424226	0.00054701	8.32989268	2.8967E-05	0.44111119	4.3708E-05	0.66558318	0.13133603	0.13133603	0.00068622
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	50	129.238139	3.527458463	0.00234714	0.24010983	0.0003076	0.03146669	0.00085934	0.0879098	19.55056	19.55056	0.02319536
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	120	616.682615	6.369598915	0.01752676	0.67850263	0.00156155	0.06045141	0.00185654	0.07187108	51.6630489	51.6630489	0.06902034
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	175	516.52205	11.62608878	0.01518962	1.2814196	0.00086757	0.07318988	0.00122274	0.10315214	23.7074937	23.7074937	0.03564165
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	250	538.794905	16.43940927	0.01303458	1.49059344	0.00063502	0.07261861	0.00096021	0.10980675	17.4891091	17.4891091	0.02772128
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	500	6176.78619	27.86536544	0.15212976	2.57226643	0.00711375	0.12028196	0.01094922	0.18513342	118.284609	118.284609	0.18499714
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	750	725.574082	45.31949827	0.01628928	3.81333303	0.00059739	0.13984896	0.00096896	0.22683438	8.54332802	8.54332802	0.01131481
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	50	409.499268	3.282929829	0.00686749	0.20635084	0.00077125	0.02317414	0.00200368	0.0602054	66.5613227	66.5613227	0.0872716
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	120	9988.31479	6.041658141	0.22762838	0.51604778	0.01990634	0.04512893	0.02301056	0.05216639	882.198849	882.198849	1.0849983
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	175	23658.5207	10.61021799	0.47129124	0.79218327	0.02631654	0.04423491	0.03721064	0.06254657	1189.85405	1189.85405	1.42170158
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	250	32609.9746	14.52499597	0.56628601	0.94536816	0.01932828	0.03226699	0.03395053	0.05667763	1198.02216	1198.02216	1.26366922
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	500	42590.8313	22.50463827	0.70963583	1.40537116	0.02701352	0.05349789	0.04663628	0.09235905	1009.89098	1009.89098	1.17403893
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	750	7510.19773	41.20243916	0.11653523	2.39622921	0.00464605	0.09553331	0.00795214	0.16351404	97.2655076	97.2655076	0.10378245
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	1000	2187.12994	59.14209548	0.04391224	4.45048438	0.00127106	0.12882169	0.00221625	0.22461579	19.7336896	19.7336896	0.01886954
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	9999	869.614744	107.0551141	0.01661775	7.66747315	0.00047414	0.21877149	0.00087828	0.40524169	4.33460861	4.33460861	0.00412771
2013	GBV	Construction and Mining	25	Scrapers	50	9.38006365	3.779840013	0.00017028	0.25717625	2.2528E-05	0.03402381	6.6077E-05	0.09979661	1.32422804	1.32422804	0.0040796
2013	GBV	Construction and Mining	25	Scrapers	120	428.19473	8.168343969	0.00889076	0.63566918	0.00065658	0.04694364	0.00074116	0.05299116	27.9729143	27.9729143	0.05886287
2013	GBV	Construction and Mining	25	Scrapers	175	4523.25525	15.93542239	0.11171424	1.47509711	0.00587802	0.07761459	0.00834275	0.11015927	151.466967	151.466967	0.37823766
2013	GBV	Construction and Mining	25	Scrapers	250	5195.04797	21.11036614	0.14458184	2.20201126	0.00664614	0.10122214	0.01007128	0.15338766	131.317985	131.317985	0.36716444
2013	GBV	Construction and Mining	25	Scrapers	500	45502.4864	36.08123064	0.89358984	2.65573061	0.03619174	0.10756112	0.05628611	0.16728115	672.952174	672.952174	1.61377515
2013	GBV	Construction and Mining	25	Scrapers	750	20829.1839	53.45956739	0.33521474	3.22460014	0.01282578	0.12337763	0.02016697	0.19399633	207.910886	207.910886	0.45982975
2013	GBV	Construction and Mining	25	Scrapers	1000	325.603468	89.74853789	0.01309703	13.530399	0.00061063	0.63083667	0.00094862	0.98000826	1.93594072	1.93594072	0.00757641
2013	GBV	Construction and Mining	25	Scrapers	9999	1183.49329	185.6718966	0.02520093	14.8182349	0.00093657	0.55070821	0.00143022	0.84097363	3.40133994	3.40133994	0.00757641
2013	GBV	Construction and Mining	26	Skid Steer Loaders	50	2228.45155	3.504004716	0.02907181	0.17132991	0.00202782	0.01195064	0.00379305	0.02235371	339.366467	339.366467	1.21416335
2013	GBV	Construction and Mining	26	Skid Steer Loaders	120	11841.9825	5.094233387	0.15810773	0.25492187	0.00965222	0.01556256	0.01001998	0.01615552	1240.44065	1240.44065	3.91819001
2013	GBV	Construction and Mining	26	Skid Steer Loaders	175	80.0850149	10.96170167	0.00105007	0.53869623	4.7537E-05	0.02438715	6.3462E-05	0.03255663	3.89855527	3.89855527	0.01625305
2013	GBV	Construction and Mining	26	Skid Steer Loaders	250	61.529677	14.24518582	0.00085244	0.73968129	3.376E-05	0.02929468	4.9856E-05	0.04326132	2.30487262	2.30487262	0.00902947
2013	GBV	Construction and Mining	26	Skid Steer Loaders	500	16.894127	19.44304444	0.0001598	0.68931534	5.6059E-06	0.02418098	9.5306E-06	0.04111022	0.46366242	0.46366242	0.00180589
2013	GBV	Construction and Mining	26	Skid Steer Loaders	750	17.8210775	38.24809765	0.00012795	1.02920678	5.2442E-06	0.04218463	6.0181E-06	0.04840997	0.24863057	0.24863057	0.00060196
2013	GBV	Construction and Mining	26	Skid Steer Loaders	1000	29.0807997	72.16622199	0.00072034	6.69988652	2.5828E-05	0.24022211	4.5941E-05	0.42729141	0.21503185	0.21503185	0.00120393
2013	GBV	Construction and Mining	27	Surfacing Equipment	50	20.524422	2.375477954	0.00030266	0.13129223	2.4982E-05	0.01083704	5.5237E-05	0.02396141	4.6105246	4.6105246	0.02129816
2013	GBV	Construction and Mining	27	Surfacing Equipment	120	161.242978	5.230957144	0.00281964	0.34284199	0.00020117	0.0244599	0.00023549	0.02863296	16.4486425	16.4486425	0.06826333
2013	GBV	Construction and Mining	27	Surfacing Equipment	175	83.5588533	8.899523406	0.00149593	0.59715098	7.2728E-05	0.02903186	0.00010304	0.04113101	5.01021237	5.01021237	0.02293648
2013	GBV	Construction and Mining	27	Surfacing Equipment	250	177.39144	12.88779391	0.00312112	0.84987748	0.00010004	0.02724096	0.00016254	0.04425919	7.34487637	7.34487637	0.03440472
2013	GBV	Construction and Mining	27	Surfacing Equipment	500	560.381763	21.26713592	0.00692968	0.98568359	0.00022244	0.03163954	0.00033982	0.04833636	14.0606501	14.0606501	0.05679509
2013	GBV	Construction and Mining	27	Surfacing Equipment	750	518.449943	36.25609729	0.00539895	1.41508744	0.00017082	0.04477374	0.00023327	0.06114206	7.63055612	7.63055612	0.02839755
2013	GBV	Construction and Mining	27	Surfacing Equipment	1000	84.5543101	48.25062538	0.00144698	3.09476834	3.5155E-05	0.07518899	6.1661E-05	0.13187845	0.93511111	0.93511111	0.00382275
2013	GBV	Construction and Mining	27	Surfacing Equipment	9999	29.6376276	66.31030171	0.0003454	2.89640306	7.7276E-06	0.06480071	1.1955E-05	0.10024992	0.23850245	0.23850245	0.00109221
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	50	4401.11355	3.012784229	0.06693674	0.17173927	0.00634495	0.0162792	0.01453185	0.03728429	779.515864	779.515864	1.69912977
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	120	71376.5494	6.050381911	1.24537508	0.39566442	0.09924569	0.03153105	0.10843419	0.0344503	6295.10783	6295.10783	11.5369135
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	175	12316.5568	10.33705821	0.19812423	0.62322493	0.01002883	0.03154695	0.01392483	0.04380231	635.803284	635.803284	1.29062819
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	250	7136.032	14.70168306	0.11246826	0.86844003	0.00362854	0.02801827	0.00605085	0.04672254	259.012156	259.012156	0.51625127

Calendar Year	AirBasin	Equipment Class	Equipment Type ID	Equipment Type	Horse power Bin	BaseBSFC (pounds/yr)	FC (liter/hr)	BaseNOx	NOx (lb/hr)	BasePM	PM (lb/hour)	BaseHC	HC (lb/hr)	Base Activity (hr/yr)	Scen Activity	Population
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	500	9619.69215	23.17124981	0.13782374	1.2442622	0.00468572	0.04230232	0.00774901	0.06995745	221.534887	221.534887	0.46592862
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	750	1353.24984	40.87989952	0.01779509	2.01479843	0.000639	0.07234863	0.00102284	0.1158077	17.6643873	17.6643873	0.03256172
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	1000	229.403715	63.54434554	0.00298088	3.09471655	5.5837E-05	0.0579698	0.00011503	0.11942106	1.92643317	1.92643317	0.00296016
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	9999	3217.41335	144.9548752	0.05621732	9.49282912	0.00175053	0.29559389	0.00280866	0.4742695	11.8441649	11.8441649	0.02190516
2013	GBV	Construction and Mining	29	Trenchers	50	1563.18112	4.378077469	0.02313121	0.24281312	0.00213778	0.02244067	0.00448403	0.04706974	190.526888	190.526888	0.55720309
2013	GBV	Construction and Mining	29	Trenchers	120	1132.57135	8.13985555	0.02514927	0.67744817	0.0019668	0.05297978	0.0023697	0.06383285	74.2470646	74.2470646	0.25833962
2013	GBV	Construction and Mining	29	Trenchers	175	230.925329	14.02909666	0.00594583	1.35384814	0.00030859	0.07026433	0.00044545	0.10142861	8.78359446	8.78359446	0.03419201
2013	GBV	Construction and Mining	29	Trenchers	250	452.704995	21.54676325	0.0095794	1.70885316	0.0003767	0.0671993	0.00059182	0.10557433	11.2114984	11.2114984	0.04052386
2013	GBV	Construction and Mining	29	Trenchers	500	764.528953	35.26639553	0.01057265	1.82789194	0.00039029	0.06747757	0.00060031	0.10378739	11.5681331	11.5681331	0.03672475
2013	GBV	Construction and Mining	29	Trenchers	750	344.757478	61.29361883	0.0021163	1.41018916	7.249E-05	0.04830352	0.00010318	0.06875578	3.00143433	3.00143433	0.00759822
2013	GBV	Construction and Mining	29	Trenchers	1000	20.3623551	84.63129669	0.00079993	12.4610559	3.6107E-05	0.56246702	5.6874E-05	0.88596442	0.12838888	0.12838888	0.00063319
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	50	1358.84241	3.533426938	0.02126878	0.20728565	0.00223916	0.02182288	0.00544053	0.05302346	205.212301	205.212301	0.32706033
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	120	2100.136	6.947367198	0.04489367	0.55661835	0.00393035	0.04873085	0.00444799	0.05514881	161.308621	161.308621	0.2662792
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	175	523.857809	14.26083139	0.0153277	1.56389614	0.00085827	0.08756958	0.00122325	0.12480921	19.6019371	19.6019371	0.03068
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	250	279.195098	18.16363483	0.00561071	1.36808252	0.00022143	0.05399266	0.00034548	0.08424083	8.20229604	8.20229604	0.01273509
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	500	77.8917806	26.99016702	0.00140304	1.8221441	6.0293E-05	0.07830285	8.6704E-05	0.11260314	1.53998494	1.53998494	0.00231547
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	1000	54.5886198	75.66169136	0.00065579	3.40674259	1.6339E-05	0.08487785	1.955E-05	0.10155687	0.38499623	0.38499623	0.00057887

8. Offroad2007 Output

CY	Season	AvgDays	Code	Equipment	Fuel	MaxHP	Activity	Consumption	ROG Exhaust	CO Exhaust	CO (lb/hr)	NOX Exhaust	CO2 Exhaust	SO2 Exhaust	SO2 (lb/hr)	PM Exhaust	N2O Exhaust	CH4 Exhaust
2013	Annual	Mon-Sun	2270002003	Pavers	D	25	5.98E-02	5.08E-02	7.36E-07	2.39E-06	7.98E-02	4.48E-06	5.57E-04	7.07E-09	2.37E-04	2.24E-07	0.00E+00	6.64E-08
2013	Annual	Mon-Sun	2270002003	Pavers	D	50	3.53E+00	4.62E+00	2.41E-04	6.33E-04	3.59E-01	5.20E-04	4.93E-02	6.38E-07	3.62E-04	5.44E-05	0.00E+00	2.17E-05
2013	Annual	Mon-Sun	2270002003	Pavers	D	120	4.16E+00	1.32E+01	2.89E-04	1.05E-03	5.05E-01	1.74E-03	1.44E-01	1.69E-06	8.11E-04	1.52E-04	0.00E+00	2.60E-05
2013	Annual	Mon-Sun	2270002003	Pavers	D	175	2.59E+00	1.52E+01	2.30E-04	1.01E-03	7.78E-01	1.78E-03	1.66E-01	1.86E-06	1.44E-03	9.95E-05	0.00E+00	2.07E-05
2013	Annual	Mon-Sun	2270002003	Pavers	D	250	3.12E-01	2.75E+00	3.22E-05	9.46E-05	6.07E-01	3.03E-04	3.03E-02	3.40E-07	2.19E-03	1.18E-05	0.00E+00	2.91E-06
2013	Annual	Mon-Sun	2270002003	Pavers	D	500	3.20E-01	3.39E+00	3.63E-05	1.48E-04	9.23E-01	3.37E-04	3.72E-02	3.66E-07	2.29E-03	1.30E-05	0.00E+00	3.28E-06
2013	Annual	Mon-Sun	2270002009	Plate Compactors	D	15	9.38E-01	1.85E-01	2.35E-06	1.23E-05	2.63E-02	1.47E-05	2.02E-03	3.15E-08	6.71E-05	5.77E-07	0.00E+00	2.12E-07
2013	Annual	Mon-Sun	2270002015	Rollers	D	15	2.04E+00	5.89E-01	7.50E-06	3.94E-05	3.86E-02	4.70E-05	6.45E-03	1.00E-07	9.83E-05	1.82E-06	0.00E+00	6.77E-07
2013	Annual	Mon-Sun	2270002015	Rollers	D	25	8.54E-01	5.18E-01	6.88E-06	2.34E-05	5.49E-02	4.36E-05	5.69E-03	7.22E-08	1.69E-04	1.75E-06	0.00E+00	6.21E-07
2013	Annual	Mon-Sun	2270002015	Rollers	D	50	2.68E+00	3.24E+00	1.37E-04	3.90E-04	2.91E-01	3.46E-04	3.48E-02	4.50E-07	3.36E-04	3.28E-05	0.00E+00	1.24E-05
2013	Annual	Mon-Sun	2270002015	Rollers	D	120	1.44E+01	3.89E+01	7.10E-04	2.92E-03	4.06E-01	4.50E-03	4.24E-01	4.98E-06	6.91E-04	3.84E-04	0.00E+00	6.41E-05
2013	Annual	Mon-Sun	2270002015	Rollers	D	175	5.79E+00	2.85E+01	3.61E-04	1.79E-03	6.19E-01	2.93E-03	3.13E-01	3.52E-06	1.22E-03	1.59E-04	0.00E+00	3.26E-05
2013	Annual	Mon-Sun	2270002015	Rollers	D	250	8.21E-01	5.70E+00	5.18E-05	1.59E-04	3.88E-01	5.39E-04	6.28E-02	7.06E-07	1.72E-03	1.85E-05	0.00E+00	4.67E-06
2013	Annual	Mon-Sun	2270002015	Rollers	D	500	5.76E-01	5.72E+00	4.76E-05	1.81E-04	6.30E-01	4.84E-04	6.30E-02	6.18E-07	2.15E-03	1.70E-05	0.00E+00	4.29E-06
2013	Annual	Mon-Sun	2270002018	Scrapers	D	120	2.11E-01	9.07E-01	1.98E-05	7.31E-05	6.94E-01	1.17E-04	9.88E-03	1.16E-07	1.10E-03	1.04E-05	0.00E+00	1.78E-06
2013	Annual	Mon-Sun	2270002018	Scrapers	D	175	1.93E+00	1.30E+01	2.00E-04	8.77E-04	9.10E-01	1.50E-03	1.43E-01	1.60E-06	1.66E-03	8.52E-05	0.00E+00	1.80E-05
2013	Annual	Mon-Sun	2270002018	Scrapers	D	250	1.88E+00	1.79E+01	2.11E-04	6.01E-04	6.40E-01	1.92E-03	1.97E-01	2.21E-06	2.35E-03	7.42E-05	0.00E+00	1.91E-05
2013	Annual	Mon-Sun	2270002018	Scrapers	D	500	5.17E+00	7.55E+01	8.23E-04	3.13E-03	1.21E+00	7.31E-03	8.31E-01	8.15E-06	3.15E-03	2.84E-04	0.00E+00	7.43E-05
2013	Annual	Mon-Sun	2270002018	Scrapers	D	750	3.61E+00	9.12E+01	9.98E-04	3.78E-03	2.09E+00	9.00E-03	1.00E+00	1.01E-05	5.58E-03	3.46E-04	0.00E+00	9.00E-05
2013	Annual	Mon-Sun	2270002021	Paving Equipment	D	25	1.05E-01	6.01E-02	7.98E-07	2.72E-06	5.19E-02	5.06E-06	6.60E-04	8.38E-09	1.60E-04	2.03E-07	0.00E+00	7.20E-08
2013	Annual	Mon-Sun	2270002021	Paving Equipment	D	50	8.93E-02	1.00E-01	5.21E-06	1.36E-05	3.05E-01	1.12E-05	1.07E-03	1.38E-08	3.09E-04	1.17E-06	0.00E+00	4.70E-07
2013	Annual	Mon-Sun	2270002021	Paving Equipment	D	120	1.29E+00	3.22E+00	7.00E-05	2.54E-04	3.96E-01	4.22E-04	3.50E-02	4.11E-07	6.39E-04	3.69E-05	0.00E+00	6.31E-06
2013	Annual	Mon-Sun	2270002021	Paving Equipment	D	175	6.05E-01	2.79E+00	4.20E-05	1.84E-04	6.07E-01	3.27E-04	3.05E-02	3.43E-07	1.14E-03	1.82E-05	0.00E+00	3.79E-06
2013	Annual	Mon-Sun	2270002021	Paving Equipment	D	250	1.70E-01	9.47E-01	1.09E-05	3.20E-05	3.76E-01	1.04E-04	1.04E-02	1.17E-07	1.37E-03	3.98E-06	0.00E+00	9.82E-07
2013	Annual	Mon-Sun	2270002024	Surfacing Equipme	D	50	4.40E-02	2.87E-02	1.05E-06	3.08E-06	1.40E-01	2.98E-06	3.10E-04	4.00E-09	1.82E-04	2.61E-07	0.00E+00	9.45E-08
2013	Annual	Mon-Sun	2270002024	Surfacing Equipme	D	120	8.79E-03	2.56E-02	4.27E-07	1.85E-06	4.21E-01	2.87E-06	2.80E-04	3.28E-09	7.47E-04	2.27E-07	0.00E+00	3.85E-08
2013	Annual	Mon-Sun	2270002024	Surfacing Equipme	D	175	6.59E-03	2.58E-02	2.95E-07	1.56E-06	4.73E-01	2.55E-06	2.82E-04	3.18E-09	9.64E-04	1.29E-07	0.00E+00	2.66E-08
2013	Annual	Mon-Sun	2270002024	Surfacing Equipme	D	250	1.32E-02	8.06E-02	6.75E-07	2.22E-06	3.37E-01	7.37E-06	8.88E-04	1.00E-08	1.52E-03	2.48E-07	0.00E+00	6.09E-08
2013	Annual	Mon-Sun	2270002024	Surfacing Equipme	D	500	1.10E-01	1.10E+00	8.41E-06	3.52E-05	6.41E-01	9.11E-05	1.21E-02	1.19E-07	2.17E-03	3.11E-06	0.00E+00	7.59E-07
2013	Annual	Mon-Sun	2270002024	Surfacing Equipme	D	750	2.81E-01	4.42E+00	3.43E-05	1.41E-04	1.01E+00	3.74E-04	4.87E-02	4.90E-07	3.49E-03	1.26E-05	0.00E+00	3.09E-06
2013	Annual	Mon-Sun	2270002027	Signal Boards	D	15	1.03E+01	2.89E+00	3.68E-05	1.93E-04	3.76E-02	2.30E-04	3.16E-02	4.92E-07	9.59E-05	8.99E-06	0.00E+00	3.32E-06
2013	Annual	Mon-Sun	2270002027	Signal Boards	D	50	3.64E-02	6.09E-02	2.09E-06	6.28E-06	3.45E-01	6.20E-06	6.57E-04	8.50E-09	4.67E-04	5.38E-07	0.00E+00	1.89E-07
2013	Annual	Mon-Sun	2270002027	Signal Boards	D	120	5.95E-01	2.18E+00	3.50E-05	1.55E-04	5.21E-01	2.32E-04	2.38E-02	2.80E-07	9.40E-04	1.92E-05	0.00E+00	3.16E-06
2013	Annual	Mon-Sun	2270002027	Signal Boards	D	175	3.69E-01	2.60E+00	2.83E-05	1.54E-04	8.33E-01	2.46E-04	2.85E-02	3.20E-07	1.74E-03	1.26E-05	0.00E+00	2.56E-06
2013	Annual	Mon-Sun	2270002027	Signal Boards	D	250	7.79E-02	9.00E-01	6.36E-06	2.08E-05	5.34E-01	7.78E-05	9.94E-03	1.12E-07	2.87E-03	2.26E-06	0.00E+00	5.74E-07
2013	Annual	Mon-Sun	2270002030	Trenchers	D	15	2.25E-01	8.69E-02	1.11E-06	5.81E-06	5.16E-02	6.94E-06	9.52E-04	1.48E-08	1.32E-04	2.71E-07	0.00E+00	9.99E-08
2013	Annual	Mon-Sun	2270002030	Trenchers	D	25	2.37E-01	3.55E-01	4.70E-06	1.60E-05	1.35E-01	2.97E-05	3.90E-03	4.95E-08	4.17E-04	1.15E-06	0.00E+00	4.24E-07
2013	Annual	Mon-Sun	2270002030	Trenchers	D	50	9.21E+00	1.42E+01	7.21E-04	1.88E-03	4.08E-01	1.58E-03	1.51E-01	1.96E-06	4.25E-04	1.63E-04	0.00E+00	6.51E-05
2013	Annual	Mon-Sun	2270002030	Trenchers	D	120	1.25E+01	3.72E+01	8.00E-04	2.92E-03	4.68E-01	4.90E-03	4.05E-01	4.75E-06	7.61E-04	4.17E-04	0.00E+00	7.22E-05
2013	Annual	Mon-Sun	2270002030	Trenchers	D	175	1.37E+00	8.98E+00	1.34E-04	5.89E-04	8.62E-01	1.06E-03	9.82E-02	1.11E-06	1.62E-03	5.80E-05	0.00E+00	1.21E-05
2013	Annual	Mon-Sun	2270002030	Trenchers	D	250	1.23E-01	1.24E+00	1.44E-05	4.33E-05	7.08E-01	1.38E-04	1.36E-02	1.54E-07	2.51E-03	5.38E-06	0.00E+00	1.30E-06
2013	Annual	Mon-Sun	2270002030	Trenchers	D	500	1.56E-01	2.21E+00	2.33E-05	1.01E-04	1.30E+00	2.22E-04	2.43E-02	2.38E-07	3.05E-03	8.62E-06	0.00E+00	2.10E-06
2013	Annual	Mon-Sun	2270002030	Trenchers	D	750	7.84E-02	2.09E+00	2.22E-05	9.60E-05	2.45E+00	2.14E-04	2.30E-02	2.31E-07	5.90E-03	8.22E-06	0.00E+00	2.00E-06
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	15	3.94E-02	1.86E-02	2.37E-07	1.24E-06	6.31E-02	1.48E-06	2.03E-04	3.17E-09	1.61E-04	5.76E-08	0.00E+00	2.14E-08
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	25	1.18E-01	8.59E-02	1.14E-06	3.88E-06	6.58E-02	7.23E-06	9.43E-04	1.20E-08	2.03E-04	2.90E-07	0.00E+00	1.03E-07
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	50	5.36E-01	7.60E-01	7.74E-06	6.11E-05	2.28E-01	6.88E-05	8.31E-03	1.07E-07	4.01E-04	3.20E-06	0.00E+00	6.98E-07
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	120	1.64E+00	5.77E+00	3.67E-05	3.86E-04	4.69E-01	3.76E-04	6.34E-02	7.43E-07	9.04E-04	2.11E-05	0.00E+00	3.31E-06
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	175	3.80E-01	2.44E+00	1.34E-05	1.43E-04	7.53E-01	1.32E-04	2.68E-02	3.02E-07	1.59E-03	5.73E-06	0.00E+00	1.21E-06
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	250	3.27E-01	2.78E+00	1.30E-05	5.61E-05	3.43E-01	1.25E-04	3.08E-02	3.46E-07	2.11E-03	3.61E-06	0.00E+00	1.17E-06
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	500	7.28E-01	1.02E+01	4.71E-05	2.01E-04	5.51E-01	4.26E-04	1.13E-01	1.11E-06	3.05E-03	1.31E-05	0.00E+00	4.25E-06
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	750	1.62E+00	4.51E+01	2.08E-04	8.83E-04	1.09E+00	1.90E-03	4.98E-01	5.01E-06	6.18E-03	5.81E-05	0.00E+00	1.88E-05
2013	Annual	Mon-Sun	2270002033	Bore/Drill Rigs	D	1000	2.72E+00	1.14E+02	5.66E-04	2.26E-03	1.67E+00	8.09E-03	1.26E+00	1.27E-05	9.33E-03	2.10E-04	0.00E+00	5.11E-05
2013	Annual	Mon-Sun	2270002036	Excavators	D	25	2.51E-01	1.88E-01	2.48E-06	8.48E-06	6.76E-02	1.57E-05	2.06E-03	2.61E-08	2.08E-04	5.88E-07	0.00E+00	2.24E-07
2013	Annual	Mon-Sun	2270002036	Excavators	D	50	9.62E+00	1.12E+01	3.93E-04	1.37E-03	2.84E-01	1.18E-03	1.20E-01	1.55E-06	3.23E-04	1.02E-04	0.00E+00	3.54E-05
2013	Annual	Mon-Sun	2270002036	Excavators	D	120	2.61E+01	8.80E+01	1.42E-03	6.76E-03	5.17E-01	8.87E-03	9.61E-01	1.13E-05	8.63E-04	7.67E-04	0.00E+00	1.28E-04
2013	Annual	Mon-Sun	2270002036	Excavators	D	175	5.04E+01	2.58E+02	3.05E-03	1.68E-02	6.66E-01	2.25E-02	2.82E+00	3.18E-05	1.26E-03	1.29E-03	0.00E+00	2.75E-04
2013	Annual	Mon-Sun	2270002036	Excavators	D	250	2.05E+01	1.47E+02	1.27E-03	3.63E-03	3.54E-01	1.16E-02	1.62E+00	1.83E-05	1.78E-03	3.81E-04	0.00E+00	1.15E-04
2013	Annual	Mon-Sun	2270002036	Excavators	D	500	1.48E+01	1.56E+02	1.28E-03	3.89E-03	5.26E-01	1.09E-02	1.73E+00	1.69E-05	2.29E-03	3.81E-04	0.00E+00	1.16E-04
2013	Annual	Mon-Sun	2270002036	Excavators	D	750	1.38E+00	2.43E+01	2.00E-04	6.04E-04	8.73E-01	1.74E-03	2.68E-01	2.69E-06	3.89E-03	6.01E-05	0.00E+00	1.80E-05
2013	Annual	Mon-Sun	2270002039	Concrete/Industrial	D	25	1.15E-02	8.62E-03	1.14E-07	3.90E-07	6.78E-02	7.22E-07	9.46E-05	1.20E-09	2.09E-04	2.80E-08	0.00E+00	1.03E-08
2013	Annual	Mon-Sun	2270002039	Concrete/Industrial	D	50	9.86E-02	1.38E-01	4.71E-06	1.44E-05	2.92E-01	1.41E-05	1.49E-03	1.92E-08	3.90E-04	1.22E-06	0.00E+00	4.25E-07
2013	Annual	Mon-Sun	2270002039	Concrete/Industrial	D	120	1.72E-01	5.82E-01	9.15E-06	4.15E-05	4.83E-01	6.14E-05	6.36E-03	7.46E-08	8.69E-04	5.06E-06	0.00E+00	8.26E-07
2013	Annual	Mon-Sun	2270002039	Concrete/Industrial	D	175	5.63E-03	4.11E-02	4.42E-07	2.45E-06	8.69E-01	3.83E-06	4.51E-04	5.07E-09	1.80E-03	1.99E-07	0.00E+00	3.99E-08
2013	Annual	Mon-Sun	2270002042	Cement and Morta	D	15	7.44E-01	2.15E-01	2.77E-06	1.43E-05	3.86E-02	1.75E-05	2.35E-03	3.66E-08	9.83E-05	7.93E-07	0.00E+00	2.50E-07
2013	Annual	Mon-Sun	2270002042	Cement and Morta	D	25	6.70E-02	5.36E-02	9.05E-07	2.72E-06	8.12E-02	5.05E-06	5.88E-04	7.46E-09	2.23E-04	2.78E-07	0.00E+00	8.16E-08
2013	Annual	Mon-Sun	2270002045	Cranes	D	50	2.11E-01	2.29E-01	1.07E-05	3.05E-05	2.89E-01	2.53E-05	2.45E-03	3.17E-08	2.99E-04	2.53E-06	0.00E+00	9.68E-07
2013	Annual	Mon-Sun	2270002045	Cranes	D	120	2.32E+00	5.33E+00	1.07E-04	4.19E-04	3.62E-01	6.38E-04	5.81E-02	6.82E-07	5.88E-04	5.72E-05	0.00E+00	9.62E-06
2013	Annual	Mon-Sun	2270002045	Cranes	D	175	2.32E+00	8.51E+00	1.20E-04	5.59E-04	4.82E-01	9.01E-04	9.31E-02	1.05E-06	9.03E-04	5.16E-05	0.00E+00	1.08E-05
2013	Annual	Mon-Sun	2270002045	Cranes	D	250	4.50E+00	2.29E+01	2.34E-04	6.62E-04	2.94E-01	2.24E-03	2.52E-01	2.83E-06	1.26E-03	7.88E-05	0.00E+00	2.11E-05
2013	Annual	Mon-Sun	2270002045	Cranes	D	500	1.65E+00	1.35E+01	1.28E-04	4.35E-04	5.28E-01	1.17E-03	1.48E-01	1.45E-06	1.77E-03	4.27E-05	0.00E+00	1.15E-05
2013	Annual	Mon-Sun	2270002045	Cranes	D	750	5.17E+00	7.11E+01	6.78E-04	2.30E-03	8.89E-01	6.34E-03	7.83E-01	7.87E-06	3.04E-03	2.28E-04	0.00E+00	6.11E-05

CY	Season	AvgDays	Code	Equipment	Fuel	MaxHP	Activity	Consumption	ROG Exhaust	CO Exhaust	CO (lb/hr)	NOX Exhaust	CO2 Exhaust	SO2 Exhaust	SO2 (lb/hr)	PM Exhaust	N2O Exhaust	CH4 Exhaust
2013	Annual	Mon-Sun	2270002045	Cranes	D	9999	6.49E+00	2.86E+02	3.08E-03	1.08E-02	3.33E+00	3.36E-02	3.15E+00	3.16E-05	9.75E-03	1.03E-03	0.00E+00	2.78E-04
2013	Annual	Mon-Sun	2270002048	Graders	D	50	6.46E-02	8.28E-02	3.49E-06	1.05E-05	3.26E-01	8.95E-06	8.89E-04	1.15E-08	3.56E-04	8.47E-07	0.00E+00	3.15E-07
2013	Annual	Mon-Sun	2270002048	Graders	D	120	4.31E+00	1.48E+01	2.70E-04	1.14E-03	5.31E-01	1.67E-03	1.61E-01	1.89E-06	8.79E-04	1.46E-04	0.00E+00	2.44E-05
2013	Annual	Mon-Sun	2270002048	Graders	D	175	1.47E+01	8.33E+01	1.08E-03	5.40E-03	7.34E-01	8.24E-03	9.12E-01	1.03E-05	1.39E-03	4.65E-04	0.00E+00	9.75E-05
2013	Annual	Mon-Sun	2270002048	Graders	D	250	9.14E+00	7.13E+01	6.81E-04	1.98E-03	4.33E-01	6.48E-03	7.86E-01	8.84E-06	1.93E-03	2.25E-04	0.00E+00	6.15E-05
2013	Annual	Mon-Sun	2270002048	Graders	D	500	2.58E-01	2.69E+00	2.40E-05	8.11E-05	6.28E-01	2.18E-04	2.96E-02	2.91E-07	2.25E-03	7.85E-06	0.00E+00	2.16E-06
2013	Annual	Mon-Sun	2270002048	Graders	D	750	5.90E-02	1.30E+00	1.16E-05	3.92E-05	1.33E+00	1.08E-04	1.43E-02	1.44E-07	4.88E-03	3.85E-06	0.00E+00	1.05E-06
2013	Annual	Mon-Sun	2270002051	Off-Highway Truck	D	175	6.28E-01	3.58E+00	4.52E-05	2.38E-04	7.57E-01	3.23E-04	3.92E-02	4.41E-07	1.41E-03	1.89E-05	0.00E+00	4.08E-06
2013	Annual	Mon-Sun	2270002051	Off-Highway Truck	D	250	4.63E+00	3.50E+01	3.24E-04	8.88E-04	3.83E-01	2.87E-03	3.86E-01	4.34E-06	1.87E-03	9.55E-05	0.00E+00	2.92E-05
2013	Annual	Mon-Sun	2270002051	Off-Highway Truck	D	500	6.53E+00	8.05E+01	7.07E-04	2.07E-03	6.35E-01	5.83E-03	8.88E-01	8.72E-06	2.67E-03	2.07E-04	0.00E+00	6.38E-05
2013	Annual	Mon-Sun	2270002051	Off-Highway Truck	D	750	2.59E+01	5.18E+02	4.58E-03	1.33E-02	1.03E+00	3.86E-02	5.72E+00	5.75E-05	4.44E-03	1.35E-03	0.00E+00	4.13E-04
2013	Annual	Mon-Sun	2270002051	Off-Highway Truck	D	1000	1.21E+01	3.44E+02	3.32E-03	1.01E-02	1.67E+00	3.62E-02	3.79E+00	3.81E-05	6.28E-03	1.09E-03	0.00E+00	3.00E-04
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	50	7.42E-01	1.52E+00	6.46E-05	1.86E-04	5.01E-01	1.62E-04	1.63E-02	2.11E-07	5.69E-04	1.57E-05	0.00E+00	5.83E-06
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	120	2.09E+00	7.96E+00	1.47E-04	6.02E-04	5.76E-01	8.94E-04	8.68E-02	1.02E-06	9.74E-04	8.15E-05	0.00E+00	1.32E-05
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	175	8.86E-01	6.76E+00	8.60E-05	4.25E-04	9.61E-01	6.75E-04	7.40E-02	8.33E-07	1.88E-03	3.83E-05	0.00E+00	7.76E-06
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	250	8.81E-02	9.75E-01	8.14E-06	2.39E-05	5.42E-01	8.90E-05	1.08E-02	1.21E-07	2.75E-03	2.73E-06	0.00E+00	7.34E-07
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	500	4.96E-01	8.39E+00	6.47E-05	2.10E-04	8.47E-01	6.72E-04	9.26E-02	9.09E-07	3.66E-03	2.19E-05	0.00E+00	5.84E-06
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	750	9.88E-02	2.64E+00	2.04E-05	6.52E-05	1.32E+00	2.19E-04	2.91E-02	2.92E-07	5.92E-03	6.99E-06	0.00E+00	1.85E-06
2013	Annual	Mon-Sun	2270002054	Crushing/Proc. Equ	D	9999	9.88E-02	5.86E+00	5.56E-05	1.82E-04	3.68E+00	6.57E-04	6.46E-02	6.49E-07	1.31E-02	1.92E-05	0.00E+00	5.02E-06
2013	Annual	Mon-Sun	2270002057	Rough Terrain Forl	D	50	6.10E-01	9.59E-01	3.61E-05	1.15E-04	3.78E-01	1.01E-04	1.03E-02	1.33E-07	4.37E-04	9.17E-06	0.00E+00	3.26E-06
2013	Annual	Mon-Sun	2270002057	Rough Terrain Forl	D	120	2.92E+01	8.35E+01	1.40E-03	6.32E-03	4.32E-01	8.76E-03	9.12E-01	1.07E-05	7.32E-04	7.75E-04	0.00E+00	1.26E-04
2013	Annual	Mon-Sun	2270002057	Rough Terrain Forl	D	175	3.74E+00	2.13E+01	2.53E-04	1.36E-03	7.25E-01	1.96E-03	2.34E-01	2.63E-06	1.40E-03	1.11E-04	0.00E+00	2.29E-05
2013	Annual	Mon-Sun	2270002057	Rough Terrain Forl	D	250	2.09E-01	1.62E+00	1.35E-05	3.96E-05	3.79E-01	1.35E-04	1.78E-02	2.01E-07	1.92E-03	4.34E-06	0.00E+00	1.22E-06
2013	Annual	Mon-Sun	2270002057	Rough Terrain Forl	D	500	1.37E-01	1.60E+00	1.25E-05	3.92E-05	5.71E-01	1.17E-04	1.76E-02	1.73E-07	2.52E-03	4.01E-06	0.00E+00	1.13E-06
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	25	6.50E-02	5.01E-02	6.64E-07	2.27E-06	6.96E-02	4.20E-06	5.50E-04	6.98E-09	2.15E-04	1.63E-07	0.00E+00	5.99E-08
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	50	1.29E+00	1.87E+00	7.73E-05	2.34E-04	3.64E-01	2.01E-04	2.00E-02	2.59E-07	4.02E-04	1.88E-05	0.00E+00	6.97E-06
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	120	3.50E+01	9.44E+01	1.70E-03	7.26E-03	4.15E-01	1.05E-02	1.03E+00	1.21E-05	6.90E-04	9.20E-04	0.00E+00	1.53E-04
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	175	1.97E+01	9.57E+01	1.22E-03	6.18E-03	6.27E-01	9.38E-03	1.05E+00	1.18E-05	1.20E-03	5.28E-04	0.00E+00	1.10E-04
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	250	1.96E+01	1.32E+02	1.23E-03	3.61E-03	3.68E-01	1.19E-02	1.46E+00	1.64E-05	1.67E-03	4.09E-04	0.00E+00	1.11E-04
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	500	8.17E+00	8.77E+01	7.62E-04	2.61E-03	6.39E-01	7.00E-03	9.67E-01	9.49E-06	2.32E-03	2.50E-04	0.00E+00	6.87E-05
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	750	2.44E+00	5.37E+01	4.69E-04	1.60E-03	1.31E+00	4.40E-03	5.92E-01	5.96E-06	4.88E-03	1.56E-04	0.00E+00	4.24E-05
2013	Annual	Mon-Sun	2270002060	Rubber Tired Load	D	1000	2.62E-01	7.06E+00	6.80E-05	2.41E-04	1.84E+00	7.81E-04	7.78E-02	7.82E-07	5.97E-03	2.35E-05	0.00E+00	6.13E-06
2013	Annual	Mon-Sun	2270002063	Rubber Tired Doze	D	175	7.90E-02	4.68E-01	8.38E-06	3.34E-05	8.45E-01	6.15E-05	5.11E-03	5.75E-08	1.46E-03	3.53E-06	0.00E+00	7.56E-07
2013	Annual	Mon-Sun	2270002063	Rubber Tired Doze	D	250	1.94E+00	1.62E+01	2.35E-04	6.60E-04	6.82E-01	2.01E-03	1.78E-01	2.00E-06	2.06E-03	8.51E-05	0.00E+00	2.12E-05
2013	Annual	Mon-Sun	2270002063	Rubber Tired Doze	D	500	2.98E+00	3.60E+01	4.78E-04	2.11E-03	1.42E+00	4.06E-03	3.94E-01	3.87E-06	2.60E-03	1.69E-04	0.00E+00	4.31E-05
2013	Annual	Mon-Sun	2270002063	Rubber Tired Doze	D	750	4.48E+00	8.15E+01	1.09E-03	4.79E-03	2.14E+00	9.35E-03	8.93E-01	8.98E-06	4.01E-03	3.85E-04	0.00E+00	9.80E-05
2013	Annual	Mon-Sun	2270002063	Rubber Tired Doze	D	1000	3.03E-01	8.18E+00	1.14E-04	5.21E-04	3.44E+00	1.13E-03	8.96E-02	9.01E-07	5.95E-03	3.93E-05	0.00E+00	1.03E-05
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	25	1.29E+00	9.31E-01	1.26E-05	4.23E-05	6.56E-02	7.97E-05	1.02E-02	1.30E-07	2.01E-04	3.64E-06	0.00E+00	1.13E-06
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	50	7.91E+00	1.11E+01	3.54E-04	1.26E-03	3.20E-01	1.14E-03	1.20E-01	1.55E-06	3.92E-04	9.43E-05	0.00E+00	3.19E-05
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	120	1.06E+02	2.50E+02	3.68E-03	1.86E-02	3.53E-01	2.41E-02	2.73E+00	3.21E-05	6.06E-04	2.03E-03	0.00E+00	3.32E-04
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	175	7.89E+00	3.65E+01	3.90E-04	2.31E-03	5.86E-01	3.04E-03	4.00E-01	4.50E-06	1.14E-03	1.69E-04	0.00E+00	3.52E-05
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	250	2.55E+00	1.98E+01	1.54E-04	4.67E-04	3.66E-01	1.49E-03	2.19E-01	2.46E-06	1.93E-03	4.72E-05	0.00E+00	1.39E-05
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	500	4.12E+00	6.43E+01	4.72E-04	1.53E-03	7.44E-01	4.26E-03	7.10E-01	7.99E-06	3.88E-03	1.44E-04	0.00E+00	4.25E-05
2013	Annual	Mon-Sun	2270002066	Tractors/Loaders/B	D	750	1.21E+01	2.83E+02	2.09E-03	6.75E-03	1.12E+00	1.93E-02	3.13E+00	3.52E-05	5.82E-03	6.47E-04	0.00E+00	1.89E-04
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	50	7.12E-02	8.29E-02	4.18E-06	1.15E-05	3.24E-01	9.34E-06	8.84E-04	1.14E-08	3.21E-04	9.61E-07	0.00E+00	3.78E-07
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	120	4.04E+01	1.22E+02	2.61E-03	9.80E-03	4.85E-01	1.55E-02	1.33E+00	1.56E-05	7.71E-04	1.37E-03	0.00E+00	2.36E-04
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	175	1.37E+01	7.56E+01	1.14E-03	5.08E-03	7.44E-01	8.56E-03	8.27E-01	9.31E-06	1.36E-03	4.88E-04	0.00E+00	1.03E-04
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	250	1.17E+01	8.86E+01	1.03E-03	2.93E-03	4.99E-01	9.36E-03	9.74E-01	1.10E-05	1.87E-03	3.60E-04	0.00E+00	9.33E-05
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	500	8.05E+00	9.48E+01	1.02E-03	3.82E-03	9.48E-01	9.00E-03	1.04E+00	1.02E-05	2.54E-03	3.49E-04	0.00E+00	9.22E-05
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	750	1.73E+00	3.66E+01	3.96E-04	1.47E-03	1.70E+00	3.55E-03	4.02E-01	4.05E-06	4.67E-03	1.36E-04	0.00E+00	3.58E-05
2013	Annual	Mon-Sun	2270002069	Crawler Tractors	D	1000	1.73E+00	5.18E+01	5.97E-04	2.34E-03	2.70E+00	6.38E-03	5.69E-01	5.72E-06	6.61E-03	2.04E-04	0.00E+00	5.39E-05
2013	Annual	Mon-Sun	2270002072	Skid Steer Loaders	D	25	7.77E+00	4.89E+00	7.83E-05	2.41E-04	6.20E-02	4.53E-04	5.36E-02	6.80E-07	1.75E-04	2.44E-05	0.00E+00	7.07E-06
2013	Annual	Mon-Sun	2270002072	Skid Steer Loaders	D	50	7.18E+01	8.42E+01	1.86E-03	8.11E-03	2.26E-01	8.17E-03	9.15E-01	1.18E-05	3.30E-04	5.63E-04	0.00E+00	1.68E-04
2013	Annual	Mon-Sun	2270002072	Skid Steer Loaders	D	120	3.76E+01	7.34E+01	8.06E-04	5.16E-03	2.75E-01	6.14E-03	8.03E-01	9.42E-06	5.01E-04	4.60E-04	0.00E+00	7.28E-05
2013	Annual	Mon-Sun	2270002075	Off-Highway Tracto	D	120	5.42E-03	2.33E-02	5.73E-07	1.95E-06	7.18E-01	3.35E-06	2.54E-04	2.98E-09	1.10E-03	2.92E-07	0.00E+00	5.17E-08
2013	Annual	Mon-Sun	2270002075	Off-Highway Tracto	D	175	6.63E+00	3.95E+01	6.78E-04	2.76E-03	8.33E-01	5.08E-03	4.32E-01	4.86E-06	1.47E-03	2.89E-04	0.00E+00	6.12E-05
2013	Annual	Mon-Sun	2270002075	Off-Highway Tracto	D	250	6.27E+00	3.72E+01	5.14E-04	1.47E-03	4.68E-01	4.53E-03	4.08E-01	4.59E-06	1.47E-03	1.88E-04	0.00E+00	4.63E-05
2013	Annual	Mon-Sun	2270002075	Off-Highway Tracto	D	750	1.16E+01	3.00E+02	3.79E-03	1.68E-02	2.89E+00	3.37E-02	3.29E+00	3.31E-05	5.71E-03	1.37E-03	0.00E+00	3.42E-04
2013	Annual	Mon-Sun	2270002075	Off-Highway Tracto	D	1000	1.22E+00	4.54E+01	6.01E-04	2.76E-03	4.51E+00	6.15E-03	4.98E-01	5.00E-06	8.18E-03	2.10E-04	0.00E+00	5.42E-05
2013	Annual	Mon-Sun	2270002078	Dumpers/Tenders	D	25	7.71E-02	2.68E-02	3.72E-07	1.23E-06	3.20E-02	2.31E-06	2.94E-04	3.73E-09	9.67E-05	1.12E-07	0.00E+00	3.36E-08
2013	Annual	Mon-Sun	2270002081	Other Construction	D	15	1.11E+00	5.11E-01	6.52E-06	3.42E-05	6.17E-02	4.08E-05	5.60E-03	8.71E-08	1.57E-04	1.58E-06	0.00E+00	5.88E-07
2013	Annual	Mon-Sun	2270002081	Other Construction	D	25	1.88E-01	1.13E-01	1.50E-06	5.10E-06	5.44E-02	9.50E-06	1.24E-03	1.57E-08	1.68E-04	3.80E-07	0.00E+00	1.35E-07
2013	Annual	Mon-Sun	2270002081	Other Construction	D	50	2.93E-01	3.79E-01	1.11E-05	3.89E-05	2.65E-01	3.79E-05	4.10E-03	5.30E-08	3.62E-04	3.01E-06	0.00E+00	9.97E-07
2013	Annual	Mon-Sun	2270002081	Other Construction	D	120	4.84E-01	1.79E+00	2.44E-05	1.28E-04	5.27E-01	1.70E-04	1.96E-02	2.29E-07	9.48E-04	1.37E-05	0.00E+00	2.20E-06
2013	Annual	Mon-Sun	2270002081	Other Construction	D	175	6.68E-01	3.24E+00	3.13E-05	1.96E-04	5.87E-01	2.68E-04	3.55E-02	4.00E-07	1.20E-03	1.40E-05	0.00E+00	2.82E-06
2013	Annual	Mon-Sun	2270002081	Other Construction	D	500	1.55E+00	1.78E+01	1.13E-04	4.05E-04	5.23E-01	1.18E-03	1.97E-01	1.93E-06	2.49E-03	3.81E-05	0.00E+00	1.02E-05

9. Tier 2 Emission Factors

Offroad Drill Rig Engine Emission Factors

Equipment	HP	Load Factor[a]	Tier 2 Emission Factors (g/bhp-hr)[b]				Tier 2 Emission Rates (lb/hr)			
			ROG	NOx	CO	PM	ROG	NOx	CO	PM
Drill Rig - Units No. 1 - 3	1,354	0.5025	0.240	4.560	2.6	0.150	0.360	6.840	3.900	0.225
Drill Rig - Unit No. 4	197	0.5025	0.150	2.850	2.6	0.150	0.033	0.622	0.567	0.033

Sources:

[a] CARB (California Air Resources Board), 2011. Offroad Emissions Inventory Update Access Database (http://www.arb.ca.gov/msprog/ordiesel/offroad_1085.htm), accessed October 18, 2011.

[b] SCAQMD (South Coast Air Quality Management District). 2011. Table II - Off-Road Engine Emission Rates and Comparison of Uncontrolled to Tiered Rates and Tiered to Tiered Rates (http://aqmd.gov/ceqa/handbook/mitigation/offroad/MM_offroad.html), accessed October 18, 2011.

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C.2 Greenhouse Gas Emission Estimates

1. GHG Emissions Summaries

Construction Emissions

Emissions Source	Construction Emissions (total metric tons)			
	CO2	N2O	CH4	CO2e
Power Plant - Off-road Equipment	284.8	0.0	0.0	287.3
Power Plant - On-road Vehicle	1,466.9	0.0	0.2	1,480.5
Power Plant - Water Use	0.3	0.0	0.0	0.3
Power Plant - Subtotal	1,751.9	0.0	0.3	1,768.2
Well Development - Off-road Equipment	2,688.2	0.1	0.2	2,712.6
Well Development - On-road Vehicle	3,131.0	0.0	0.1	3,137.0
Well Development - Water Use	0.3	0.0	0.0	0.3
Well Development - Flow Testing	21.2	---	---	21.2
Well Development - Subtotal	5,840.6	0.1	0.2	5,871.1
Pipeline - Off-road Equipment	136.2	0.0	0.0	137.4
Pipeline - On-road Vehicle	495.1	0.0	0.1	500.9
Pipeline - Water Use	0.8	0.0	0.0	0.8
Pipeline - Subtotal	632.0	0.0	0.1	639.1
Grand Total (metric tons)	**8,224.5**	**0.1**	**0.6**	**8,278.4**

Annual Operation and Maintenance Emissions

Emissions Source	CO2e
On-road Vehicles	20.9
Emergency Diesel Engines	13.2
Fugitive SF_6 Emissions	39.0
Well Venting - Non-Condensable Gases	75.6
Total (maximum metric tons/year)	**148.6**

*Obtained from Mono County, 2012.

Total Annual amortized GHG Emissions

Emission Source	CO2e	
	metric tons	tons
30-year Amortized Construction Emissions	275.9	304.2
Total Direct and Indirect Annual Operation Emissions	148.6	163.9
30-year Amortized Decommissioning Emissions	80.2	88.5
Amortized Construction + Annual Operation	504.8	556.5

2. Offroad Construction Equipment Inventory

Onsite Equipment Usage for Power Plant Construction

Equipment (hp)	No.	hrs/ day	Each wks	days	annual hrs	P 1 and II total hrs*
Excavator (157 hp)	1	8	4	24	192	384
Grader (162 hp)	1	8	4	24	192	384
Loader (87 hp)	2	7	28	168	2,352	4704
Backhoe (75 hp)	1	8	4	24	192	384
Crane (208 hp)	1	7	28	168	1,176	2352
Concrete Mixer (9 hp)	2	6	28	168	2,016	4032
Drill Rig (82 hp)	1	8	4	24	192	384
Roller Compactor (84 hp)	1	8	4	24	192	384
Generator (84 hp)	1	8	28	168	1,344	2688

*It is assumed that the construction emissions for Phases I and II would be approximately the same.

Onsite Equipment Usage for Well Development

Equipment (hp)	No.	hrs/ day	Each Well Site wks	days	annual hrs	Total hrs*** hrs
Excavator (157 hp)	1	8	4	24	192	2,688
Grader (162 hp)	1	8	4	24	192	2,688
Loader (87 hp)	2	7	4	24	336	4,704
Backhoe (75 hp)	1	8	4	24	192	2,688
Drill Rig - Unit No. 1 (1,354 hp)	2	5	4	30	150	2,100
Drill Rig - Unit No. 2 (1,354 hp)	2	5	4	30	150	2,100
Drill Rig - Unit No. 3 (1,354 hp)	2	5	4	30	150	2,100
Drill Rig - Unit No. 4 (197 hp)	2	1	4	30	30	420

*The maximum day for well development assumes simultaneous drilling of two wells.

**The maximum annual emissions assume that 6 wells would be drilled per year.

***The total hours assume that 14 wells would be drilled.

Onsite Equipment Usage for Pipeline

Equipment (hp)	No.	hrs/ day	2013* wks	days	annual hrs	2014** weeks	days	annual hrs	2015*** weeks	days	annual hrs	Total hrs hrs
Crane (208 hp)	1	7	24	144	1,008	4	24	168	2	12	84	1,260
Backhoe Loader (87 hp)	2	8	24	144	2,304	4	24	384	2	12	192	2,880
Fork Lift (149 hp)	1	8	24	144	1,152	4	24	192	2	12	96	1,440
Excavator (157 hp)	1	8	2	12	96	0	0	0	0	0	0	96
Loader (87 hp)	1	7	2	12	84	0	0	0	0	0	0	84
Jack and Bore Rig (164 hp)	1	8	2	12	96	0	0	0	0	0	0	96

*It is assumed that the main pipelines, including the Highway 395 crossings, would be constructed in 2013.

**It is assumed that pipeline construction in 2014 would be limited to the pipeline segments associated with 6 well sites.

**It is assumed that pipeline construction in 2015 would be limited to the pipeline segments associated with 2 well sites.

Notes: Equipment types and weeks of use are based on the Project Description; equipment amounts, horsepower, hours per day, and total weeks of activity were obtained from SCAQMD, 2011, CalEEMond User's Manual Appendix D - Default Data Tables. It is assumed that the equipment would operate 5 days each week. Total hours for all well sites combined is estimated by multiplying the equipment total hours for each well site by six to represent the six well sites.

3. Off-road Construction Exhaust Emissions

GHG Emissions Factors for Diesel Equipment

Fuel	CO2 (kg/gal)	CO2 (g/gal)	N2O (g/gal)	CH4 (g/gal)
Diesel*	10.21	10,210.00	0.26	0.58

*Emission factors obtained from TCR, 2011, Tables 13.1 and 13.6.

Off-road Construction Fuel Consumption Factors

Equipment	Offroad HP Range	Fuel Consumption (l/hr)*	Fuel Consumption (gal/hr)
Excavator (157 hp)	120-175	10.927	2.883
Grader (162 hp)	120-175	12.109	3.195
Loader (87 hp)	50-120	6.050	1.596
Backhoe (75 hp)	50-120	6.050	1.596
Crane (208 hp)	175-250	12.269	3.237
Concrete Mixer (9 hp)	0-50	3.465	0.914
Drill Rig (82 hp)	50-120	7.823	2.064
Roller Compactor (84 hp)	50-120	6.413	1.692
Generator (84 hp)	50-120	6.614	1.745
Backhoe Loader (87 hp)	50-120	6.050	1.596
Fork Lift (149 hp)	120-175	10.191	2.689
Jack and Bore Rig (164 hp)	120-175	14.849	3.918
Drill Rig - Unit No. 1 (1,354 hp)	1,354**	140.105	36.967
Drill Rig - Unit No. 4 (197 hp)	175-250	20.387	5.379

*Fuel consumption factors were derived using Offroad2011.

**Based on ratio (1,354 hp / 875 hp) applied to 875 hp emissions (875 hp is the assumed average of 750 hp - 1,000 hp

Total On-site Power Plant Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (metric tons)			
		CO2	N2O	CH4	CO2e*
Excavator (157 hp)	384	11.30	0.00	0.00	11.41
Grader (162 hp)	384	12.53	0.00	0.00	12.64
Loader (87 hp)	4,704	76.67	0.00	0.00	77.37
Backhoe (75 hp)	384	6.26	0.00	0.00	6.32
Crane (208 hp)	2,352	77.74	0.00	0.00	78.44
Concrete Mixer (9 hp)	4,032	37.63	0.00	0.00	37.97
Drill Rig (82 hp)	384	8.09	0.00	0.00	8.17
Roller Compactor (84 hp)	384	6.63	0.00	0.00	6.69
Generator (84 hp)	2,688	47.89	0.00	0.00	48.33
Total (metric tons/project) =		**284.75**	**0.01**	**0.02**	**287.34**

Total On-site Well Development Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (metric tons)			
		CO2	N2O	CH4	CO2e*
Excavator (157 hp)	2,688	79.12	0.00	0.00	79.84
Grader (162 hp)	2,688	87.68	0.00	0.00	88.48
Loader (87 hp)	4,704	76.67	0.00	0.00	77.37
Backhoe (75 hp)	2,688	43.81	0.00	0.00	44.21
Drill Rig - Unit No. 1 (1,354 hp)	2,100	792.61	0.02	0.05	799.81
Drill Rig - Unit No. 2 (1,354 hp)	2,100	792.61	0.02	0.05	799.81
Drill Rig - Unit No. 3 (1,354 hp)	2,100	792.61	0.02	0.05	799.81
Drill Rig - Unit No. 4 (197 hp)	420	23.07	0.00	0.00	23.28
Total (metric tons/project) =		**2,688.19**	**0.07**	**0.15**	**2,712.62**

Total On-site Pipeline Construction Exhaust Emissions

Equipment	Total Hours	Total Emissions (metric tons)			
		CO2	N2O	CH4	CO2e*
Crane (208 hp)	1,260	41.64	0.00	0.00	42.02
Backhoe Loader (87 hp)	2,880	46.94	0.00	0.00	47.37
Fork Lift (149 hp)	1,440	39.53	0.00	0.00	39.89
Excavator (157 hp)	96	2.83	0.00	0.00	2.85
Loader (87 hp)	84	1.37	0.00	0.00	1.38
Jack and Bore Rig (164 hp)	96	3.84	0.00	0.00	3.88
Total (metric tons/project) =		**136.16**	**0.00**	**0.01**	**137.39**

**Global Warming Potential for CH4 = 21; GWP for N2O = 310.

Non-condensable GHG Emissions

Source	metric tons CO2/hr testing	hr/well	wells	metric tons CO2/ yr
Well Testing	0.378	4	14	21.17
Annual Emissions (metric ton/year)				**21.17**

Source: Based on data in MPLP, 2010

4. Construction Onroad Criteria Pollutant Emissions

Emission Factors

Vehicle Type	Units	Exhaust Emission Factors		
		CO2*	N20**	CH4**
Light duty truck (LDT1 gas)	g/mile	400.246	0.022	0.202
Light duty truck (LDT1 gas)	lb/mile	0.882	0.000	0.000
Heavy duty truck (T7 diesel)	g/mile	1746.100	0.005	0.005
Heavy duty truck (T7 diesel)	lb/mile	3.850	0.000	0.000

* Emission factors (g/mile) obtained online from EMFAC 2011, for Mono County, average model years, and average spee
**Emission factors (g/mile) obtained from TCR, 2011, Table 13-3.

Power Plant Construction - Worker and Material Delivery Trips

Vehicle Type	trips/day	days/proj	miles/trip	CO2	N20	CH4	CO2e*
Light duty truck	300	384	10	461.1	0.0	0.2	473.8
Heavy duty truck	30	384	50	1,005.8	0.0	0.0	1,006.7
Emissions (metric tons/project)				**1,466.9**	**0.0**	**0.2**	**1,480.5**

Notes: It is assumed that there would be 384 work days (6 days a week, four weeks per month, for 8 months for each of the phase.

Well Development Construction - Worker and Material Delivery Trips

Vehicle Type	trips/day	days/proj	miles/trip	CO2	N20	CH4	CO2e*
Light duty truck	76	392	10	119.2	0.0	0.1	122.5
Heavy duty truck	88	392	50	3,011.7	0.0	0.0	3,014.5
Emissions (metric tons/project)				**3,131.0**	**0.0**	**0.1**	**3,137.0**

Notes: It is assumed that there would be 392 work days (7 days a week, four weeks per month, for a total of 14 months.

Pipeline Construction - Worker and Material Delivery Trips

Vehicle Type	trips/day	days/proj	miles/trip	CO2	N20	CH4	CO2e*
Light duty truck	150	336	10	201.7	0.0	0.1	207.3
Heavy duty truck	10	336	50	293.3	0.0	0.0	293.6
Emissions (metric tons/project)				**495.1**	**0.0**	**0.1**	**500.9**

Notes: It is assumed that there would be 336 work days (6 days a week, four weeks per month, for a total of 14 months.

All trips per day are one-way trips obtained from Table 4.16-1.
The light-duty truck trips represent construction worker commute trips. Heavy duty truck trips represent material and fill haul trips
*Global Warming Potential for CH4 = 21; GWP for N2O = 310.

5. Operation and Maintenance

Onroad Criteria Pollutant Emissions

On-road Emission Factors

Vehicle Type	Units	Exhaust Emission Factors		
		CO2*	N20**	CH4**
Light duty truck (LDT1 gas)	g/mile	400.246	0.022	0.202
Light duty truck (LDT1 gas)	lb/mile	0.882	0.000	0.000
Heavy duty truck (T7 diesel)	g/mile	1746.100	0.005	0.005
Heavy duty truck (T7 diesel)	lb/mile	3.850	0.000	0.000

* Emission factors (g/mile) obtained online from EMFAC 2011, for Mono County, average model years, and average speed.
**Emission factors (g/mile) obtained from TCR, 2011.

Operation Worker and Plow Trips Emissions

Vehicle Type	Trips/year	miles/trip	CO2	N2O	CH4	CO2e***
Light duty truck	4,380	10	19.32	0.00	0.01	19.86
Heavy duty truck	40	20	1.54	0.00	0.00	1.54
Annual Emissions (metric ton/year)			**20.86**	**0.00**	**0.01**	**21.40**

All trips per day are one-way trips.

*The light-duty truck trips represent employee commute trips. Heavy duty truck trips represent road plowing event (2 per week for 5 months)

**Global Warming Potential for CH4 = 21; GWP for N2O = 310.

Non-condensable GHG Emissions

Source	metric tons/unit-yr	plant units	metric tons CO2/ yr
Well Venting	38	2	75.60
Annual Emissions (metric ton/year)			**75.60**

GHG Emissions Factors for Diesel Equipment

Fuel	CO2 (kg/gal)	CO2 (g/gal)	N2O (g/gal)	CH4 (g/gal)
Diesel*	10.21	10,210.00	0.26	0.58

*Emission factors obtained from TCR, 2011, Tables 13.1 and 13.6.

Off-road Construction Fuel Consumption Factor

Equipment	Offroad HP Range	Fuel Consumption (l/hr)*	Fuel Consumption (gal/hr)
Firewater Pump Engine (376 hp)	250 - 500	29.361	7.747
Emeregency Standby Generator (760 hp)	750 - 1,000	67.430	17.792

derived using Offroad2011 for

Total On-site Emergency Diesel Equipment Exhaust Emissions

Equipment*	Total Hours	Total Emissions (metric tons)			
		CO2	N2O	CH4	CO2e
Firewater Pump Engine (376 hp)	50	3.95	0.00	0.00	3.99
Emeregency Standby Generator (760 hp)	50	9.08	0.00	0.00	9.16
Total (metric tons/project) =		**13.04**	**0.00**	**0.00**	**13.15**

Fugitive SF6 Emissions

Sources	Number	SF6 (lbs/ source)*	Lbs SF6 Leaked*	Metric Tons CO2e***
OEC - circuit breakers	2	60	1.2	13.0
Well Pad - switches	8	30	2.4	26.0
Total Emissions (metric tons/year)				**39.03**

*Pounds of SF6 based on SCE, 2010; for SF6 GWP: CCAR, 2009.

**Leak rate assumed to be 0.5 percent.

***Global Warming Potential for SF6 = 23,900 (CCAR, 2009).

References:

The Climate Registry (TCR), 2011. Table 13.1 US Default Co2 Emission Factors for Transport Fuels. [http://www.theclimateregistry.org/downloads/2009/05/2011-Emission-Factors.pdf]

6. Indirect GHG Emissions

Electricity use emission factors

Units	CO2	N2O	CH4
lbs/MW-hr	681.01	0.00623	0.02829

Source: TCR, 2011, Table 14.1

Offset Electrical Grid Emissions

Capacity (MW)	Annual MWh	Metric tons			
		CO2	N2O	CH4	CO2e
33	288,288	89,053	1	4	89,380

Construction Indirect Emissions from Water Use

Source	days/proj*	Water Use		Assoc. Electricity Use		Indirect GHG Emissions (metric tons/proj)			
		gal/day**	million gals/proj	Kw-hrs***	MW-hrs	CO2	N2O	CH4	CO2e
Power Plant	384	10,000.0	3.8	960.0	1.0	0.3	0.0	0.0	0.3
Pipeline Construction	336	10,000.0	3.4	840.0	0.8	0.3	0.0	0.0	0.3
Well Development	420	25,000.0	10.5	2,625.0	2.6	0.8	0.0	0.0	0.8
					Emissions (lbs/yr)	**1.4**	**0.0**	**0.0**	**1.4**

*Power plant construction would occur over two 8-month periods, 6-days a week; pipeline construction would over a total of 14 months, 6-days a week; well drilling would occur for 30 days and each of the 14 locations.

**Obtained from Proposed Action and Alternatives Section 2.2.3.4

***Assumes 250 kw-hrs per million gallonswould be required to supply and treat the water.

7. Offroad2011 Output

Calendar Year	AirBasin	Equipment Class	Equipment Type ID	Equipment Type	Horse power Bin	BaseBSFC (pounds/yr)	FC (liter/hr)	Base Activity (hr/yr)	Scen Activity	Population
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	50	132.629384	4.455621725	15.8840722	15.8840722	0.05029321
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	120	799.8272254	7.822972277	54.5575432	54.5575432	0.15405605
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	175	944.5971749	14.84910471	33.9450761	33.9450761	0.12070371
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	250	1337.854689	20.38707155	35.0174495	35.0174495	0.12017431
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	500	1482.102716	33.60623457	23.5336268	23.5336268	0.08417495
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	750	2042.431669	61.20442071	17.8071804	17.8071804	0.04182278
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	1000	160.9377602	90.54059885	0.94851675	0.94851675	0.00158821
				average (750-1,000 hp)	875					
				hp and multiplier (1,354 / 875)	1354	1.547428571	140.1051095			
2013	GBV	Construction and Mining	11	Bore/Drill Rigs	9999	544.6253963	262.4226254	1.10745739	1.10745739	0.00158821
2013	GBV	Construction and Mining	12	Cranes	50	42.93382134	2.515894727	9.10620647	9.10620647	0.02329603
2013	GBV	Construction and Mining	12	Cranes	120	1024.062135	4.993552462	109.432698	109.432698	0.28088351
2013	GBV	Construction and Mining	12	Cranes	175	2703.507133	8.393163206	171.882739	171.882739	0.42132526
2013	GBV	Construction and Mining	12	Cranes	250	4565.36719	12.26886299	198.564593	198.564593	0.47324212
2013	GBV	Construction and Mining	12	Cranes	500	6991.709364	18.95928364	196.784939	196.784939	0.4539397
2013	GBV	Construction and Mining	12	Cranes	750	1843.516669	31.94557626	30.7940461	30.7940461	0.06656007
2013	GBV	Construction and Mining	12	Cranes	1000	431.4017274	52.58734771	4.3775491	4.3775491	0.00998401
2013	GBV	Construction and Mining	12	Cranes	9999	33.22718197	58.11349039	0.30510334	0.30510334	0.0006656
2013	GBV	Construction and Mining	13	Crawler Tractors	50	130.8178101	3.900419898	17.8972343	17.8972343	0.05907552
2013	GBV	Construction and Mining	13	Crawler Tractors	120	5798.695828	7.370706198	419.8089	419.8089	1.01668974
2013	GBV	Construction and Mining	13	Crawler Tractors	175	6306.967704	12.55200153	268.125449	268.125449	0.66519038
2013	GBV	Construction and Mining	13	Crawler Tractors	250	6363.790408	17.08212702	198.794486	198.794486	0.48619155
2013	GBV	Construction and Mining	13	Crawler Tractors	500	17068.97529	28.84378064	315.78077	315.78077	0.78156916
2013	GBV	Construction and Mining	13	Crawler Tractors	750	6639.771918	47.99621327	73.820435	73.820435	0.16009467
2013	GBV	Construction and Mining	13	Crawler Tractors	1000	878.3007434	69.98629996	6.6966967	6.6966967	0.01417813
2013	GBV	Construction and Mining	13	Crawler Tractors	9999	464.308325	123.1812091	2.0113721	2.0113721	0.00354453
2013	GBV	Construction and Mining	14	Excavators	50	5238.294598	2.976417842	939.131556	939.131556	1.44689745
2013	GBV	Construction and Mining	14	Excavators	120	6800.590899	6.051060106	599.715946	599.715946	1.04652796
2013	GBV	Construction and Mining	14	Excavators	175	14326.96174	10.92686733	699.662898	699.662898	1.32962947
2013	GBV	Construction and Mining	14	Excavators	250	18227.81536	16.36074429	594.513851	594.513851	1.14306676
2013	GBV	Construction and Mining	14	Excavators	500	30238.2962	24.50723236	658.405518	658.405518	1.16261142
2013	GBV	Construction and Mining	14	Excavators	750	2733.906528	42.80220812	34.0837916	34.0837916	0.05922626
2013	GBV	Construction and Mining	14	Excavators	1000	306.8518554	62.8145822	2.60674585	2.60674585	0.0047381
2013	GBV	Construction and Mining	14	Excavators	9999	598.3037185	116.234019	2.74674828	2.74674828	0.00414584
2013	GBV	Construction and Mining	15	Graders	50	34.59295252	3.270657966	5.64394684	5.64394684	0.01845368
2013	GBV	Construction and Mining	15	Graders	120	935.1167778	7.273411945	68.6053647	68.6053647	0.19644244
2013	GBV	Construction and Mining	15	Graders	175	8685.88924	12.10897464	382.769505	382.769505	0.91911251
2013	GBV	Construction and Mining	15	Graders	250	15071.42	16.53836916	486.286154	486.286154	0.72981343
2013	GBV	Construction and Mining	15	Graders	500	4297.760337	23.50084446	97.5863645	97.5863645	0.13631915
2013	GBV	Construction and Mining	15	Graders	1000	41.55242888	63.71096499	0.34802677	0.34802677	0.00059528
2013	GBV	Construction and Mining	15	Graders	9999	585.3526203	159.2113649	1.96188666	1.96188666	0.0029764
2013	GBV	Construction and Mining	16	Off-Highway Tractors	50	2164.193147	3.562259802	324.190915	324.190915	0.55422268
2013	GBV	Construction and Mining	16	Off-Highway Tractors	120	2770.472082	6.414184185	230.485052	230.485052	0.40296486
2013	GBV	Construction and Mining	16	Off-Highway Tractors	175	2359.996789	13.51709534	93.1662142	93.1662142	0.15300984
2013	GBV	Construction and Mining	16	Off-Highway Tractors	250	1977.538344	18.17854282	58.0492027	58.0492027	0.0998652
2013	GBV	Construction and Mining	16	Off-Highway Tractors	500	5586.198056	28.52191073	104.512474	104.512474	0.17169807
2013	GBV	Construction and Mining	16	Off-Highway Tractors	750	1407.317326	49.09373588	15.2966513	15.2966513	0.0251123
2013	GBV	Construction and Mining	16	Off-Highway Tractors	1000	39.76437363	85.28735326	0.24879401	0.24879401	0.00058401
2013	GBV	Construction and Mining	16	Off-Highway Tractors	9999	310.0759394	143.2340943	1.15518642	1.15518642	0.00233603
2013	GBV	Construction and Mining	17	Off-Highway Trucks	50	207.0882002	2.346321463	47.0975433	47.0975433	0.03298396
2013	GBV	Construction and Mining	17	Off-Highway Trucks	120	254.3123884	6.41977601	21.1386893	21.1386893	0.01851731
2013	GBV	Construction and Mining	17	Off-Highway Trucks	175	4920.252204	11.83193362	221.902428	221.902428	0.17707178
2013	GBV	Construction and Mining	17	Off-Highway Trucks	250	10092.80547	15.67990629	343.477943	343.477943	0.30322096
2013	GBV	Construction and Mining	17	Off-Highway Trucks	500	42890.2159	28.07981061	815.06918	815.06918	0.67356718
2013	GBV	Construction and Mining	17	Off-Highway Trucks	750	15411.14372	49.60659679	165.777601	165.777601	0.15392515
2013	GBV	Construction and Mining	17	Off-Highway Trucks	1000	10664.47859	67.27576451	84.5885146	84.5885146	0.07059725
2013	GBV	Construction and Mining	17	Off-Highway Trucks	9999	15357.19944	133.3633757	61.447732	61.447732	0.04571461
2013	GBV	Construction and Mining	18	Other Construction Equipment	50	1173.086403	3.464555449	180.681172	180.681172	0.42799367
2013	GBV	Construction and Mining	18	Other Construction Equipment	120	3664.407553	6.614087286	295.640727	295.640727	0.75518129
2013	GBV	Construction and Mining	18	Other Construction Equipment	175	1998.64688	12.35057801	86.353352	86.353352	0.23502209
2013	GBV	Construction and Mining	18	Other Construction Equipment	250	2567.645181	17.7914945	77.0110406	77.0110406	0.21082864
2013	GBV	Construction and Mining	18	Other Construction Equipment	500	8785.785618	29.36064138	159.678144	159.678144	0.40956056
2013	GBV	Construction and Mining	18	Other Construction Equipment	750	3411.674389	48.69529263	37.3861728	37.3861728	0.08467708
2013	GBV	Construction and Mining	18	Other Construction Equipment	1000	398.0540201	67.4298423	3.15007057	3.15007057	0.00748845
2013	GBV	Construction and Mining	18	Other Construction Equipment	9999	247.0913033	89.32839828	1.47604068	1.47604068	0.00345621
2013	GBV	Construction and Mining	19	Pavers	50	143.7391848	3.51100379	21.8461189	21.8461189	0.06937073
2013	GBV	Construction and Mining	19	Pavers	120	1389.567798	6.4410681	115.120393	115.120393	0.33702615
2013	GBV	Construction and Mining	19	Pavers	175	1888.466839	12.87513726	78.2686619	78.2686619	0.22776724
2013	GBV	Construction and Mining	19	Pavers	250	1275.243422	17.4208662	39.0619357	39.0619357	0.09827521
2013	GBV	Construction and Mining	19	Pavers	500	480.5729126	26.37485393	9.72298551	9.72298551	0.02427976
2013	GBV	Construction and Mining	19	Pavers	750	55.53356569	61.01326041	0.48569288	0.48569288	0.00115618
2013	GBV	Construction and Mining	20	Paving Equipment	50	178.6889625	2.669372622	35.7206159	35.7206159	0.08541965
2013	GBV	Construction and Mining	20	Paving Equipment	120	811.9145637	6.179960324	70.105979	70.105979	0.17430226
2013	GBV	Construction and Mining	20	Paving Equipment	175	764.8253942	10.28872802	39.6671525	39.6671525	0.09523137
2013	GBV	Construction and Mining	20	Paving Equipment	250	401.1810124	15.00455335	14.2674944	14.2674944	0.03462959
2013	GBV	Construction and Mining	20	Paving Equipment	500	565.7655702	23.40695605	12.8979886	12.8979886	0.03116663
2013	GBV	Construction and Mining	20	Paving Equipment	750	268.2811613	42.08682722	3.40153077	3.40153077	0.00750308
2013	GBV	Construction and Mining	20	Paving Equipment	1000	52.46423608	58.62525993	0.47753915	0.47753915	0.00115432
2013	GBV	Construction and Mining	21	Rollers	50	2949.020401	2.922402438	538.478253	538.478253	1.75259363
2013	GBV	Construction and Mining	21	Rollers	120	4609.147431	6.413097826	383.515701	383.515701	1.30701898
2013	GBV	Construction and Mining	21	Rollers	175	4760.898824	10.5607629	240.560365	240.560365	0.75569461
2013	GBV	Construction and Mining	21	Rollers	250	751.5427566	15.70390756	25.5373822	25.5373822	0.09267953
2013	GBV	Construction and Mining	21	Rollers	500	473.5739165	24.86693974	10.1623897	10.1623897	0.03802237
2013	GBV	Construction and Mining	21	Rollers	750	23.1359399	38.3028594	0.32231934	0.32231934	0.0011882
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	50	150.1665345	4.145494908	19.3297922	19.3297922	0.079602
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	120	12077.95277	7.593355959	848.769923	848.769923	3.41053389
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	175	2220.668003	10.19133174	116.274133	116.274133	0.45633904

Calendar Year	AirBasin	Equipment Class	Equipment Type ID	Equipment Type	Horse power Bin	BaseBSFC (pounds/yr)	FC (liter/hr)	Base Activity (hr/yr)	Scen Activity	Population
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	250	182.7754196	16.44614611	5.93040098	5.93040098	0.02676274
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	500	77.39902356	29.15285687	1.41672245	1.41672245	0.00617602
2013	GBV	Construction and Mining	22	Rough Terrain Forklifts	750	12.11033156	49.20424226	0.13133603	0.13133603	0.00068622
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	50	129.2381393	3.527458463	19.55056	19.55056	0.02319536
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	120	616.6826146	6.369598915	51.6630489	51.6630489	0.06902034
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	175	516.5220501	11.62608878	23.7074937	23.7074937	0.03564165
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	250	538.7949048	16.43940927	17.4891091	17.4891091	0.02772128
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	500	6176.786188	27.86536544	118.284609	118.284609	0.18499714
2013	GBV	Construction and Mining	23	Rubber Tired Dozers	750	725.5740825	45.31949827	8.54332802	8.54332802	0.01131481
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	50	409.4992684	3.282929829	66.5613227	66.5613227	0.0872716
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	120	9988.314789	6.041658141	882.198849	882.198849	1.0849983
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	175	23658.52074	10.61021799	1189.85405	1189.85405	1.42170158
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	250	32609.97455	14.52499597	1198.02216	1198.02216	1.26366922
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	500	42590.83131	22.50463827	1009.89098	1009.89098	1.17403893
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	750	7510.197726	41.20243916	97.2655076	97.2655076	0.10378245
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	1000	2187.129943	59.14209548	19.7336896	19.7336896	0.01886954
2013	GBV	Construction and Mining	24	Rubber Tired Loaders	9999	869.6147444	107.0551141	4.33460861	4.33460861	0.00412771
2013	GBV	Construction and Mining	25	Scrapers	50	9.380063653	3.779840013	1.32422804	1.32422804	0.0040796
2013	GBV	Construction and Mining	25	Scrapers	120	428.1947304	8.168343969	27.9729143	27.9729143	0.05886287
2013	GBV	Construction and Mining	25	Scrapers	175	4523.255249	15.93542239	151.466967	151.466967	0.37823766
2013	GBV	Construction and Mining	25	Scrapers	250	5195.04797	21.11036614	131.317985	131.317985	0.36716444
2013	GBV	Construction and Mining	25	Scrapers	500	45502.48643	36.08123064	672.952174	672.952174	1.61377515
2013	GBV	Construction and Mining	25	Scrapers	750	20829.18393	53.45956739	207.910886	207.910886	0.45982975
2013	GBV	Construction and Mining	25	Scrapers	1000	325.6034684	89.74853789	1.93594072	1.93594072	0.00757641
2013	GBV	Construction and Mining	25	Scrapers	9999	1183.493287	185.6718966	3.40133994	3.40133994	0.00757641
2013	GBV	Construction and Mining	26	Skid Steer Loaders	50	2228.451548	3.504004716	339.366467	339.366467	1.21416335
2013	GBV	Construction and Mining	26	Skid Steer Loaders	120	11841.98248	5.094233387	1240.44065	1240.44065	3.91819001
2013	GBV	Construction and Mining	26	Skid Steer Loaders	175	80.08501494	10.96170167	3.89855527	3.89855527	0.01625305
2013	GBV	Construction and Mining	26	Skid Steer Loaders	250	61.52967696	14.24518582	2.30487262	2.30487262	0.00902947
2013	GBV	Construction and Mining	26	Skid Steer Loaders	500	16.89412705	19.44304444	0.46366242	0.46366242	0.00180589
2013	GBV	Construction and Mining	26	Skid Steer Loaders	750	17.82107753	38.24809765	0.24863057	0.24863057	0.00060196
2013	GBV	Construction and Mining	26	Skid Steer Loaders	1000	29.08079965	72.16622199	0.21503185	0.21503185	0.00120393
2013	GBV	Construction and Mining	27	Surfacing Equipment	50	20.52442196	2.375477954	4.6105246	4.6105246	0.02129816
2013	GBV	Construction and Mining	27	Surfacing Equipment	120	161.2429783	5.230957144	16.4486425	16.4486425	0.06826333
2013	GBV	Construction and Mining	27	Surfacing Equipment	175	83.55885326	8.899523406	5.01021237	5.01021237	0.02293648
2013	GBV	Construction and Mining	27	Surfacing Equipment	250	177.39144	12.88779391	7.34487637	7.34487637	0.03440472
2013	GBV	Construction and Mining	27	Surfacing Equipment	500	560.3817627	21.26713592	14.0606501	14.0606501	0.05679509
2013	GBV	Construction and Mining	27	Surfacing Equipment	750	518.4499429	36.25609729	7.63055612	7.63055612	0.02839755
2013	GBV	Construction and Mining	27	Surfacing Equipment	1000	84.5543101	48.25062538	0.93511111	0.93511111	0.00382275
2013	GBV	Construction and Mining	27	Surfacing Equipment	9999	29.63762759	66.31030171	0.23850245	0.23850245	0.00109221
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	50	4401.113552	3.012784229	779.515864	779.515864	1.69912977
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	120	71376.54941	6.050381911	6295.10783	6295.10783	11.5369135
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	175	12316.55683	10.33705821	635.803284	635.803284	1.29062819
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	250	7136.031996	14.70168306	259.012156	259.012156	0.51625127
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	500	9619.692153	23.17124981	221.534887	221.534887	0.46592862
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	750	1353.249842	40.87989952	17.6643873	17.6643873	0.03256172
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	1000	229.4037147	63.54434554	1.92643317	1.92643317	0.00296016
2013	GBV	Construction and Mining	28	Tractors/Loaders/Backhoes	9999	3217.413349	144.9548752	11.8441649	11.8441649	0.02190516
2013	GBV	Construction and Mining	29	Trenchers	50	1563.181121	4.378077469	190.526888	190.526888	0.55720309
2013	GBV	Construction and Mining	29	Trenchers	120	1132.571353	8.13985555	74.2470646	74.2470646	0.25833962
2013	GBV	Construction and Mining	29	Trenchers	175	230.9253287	14.02909666	8.78359446	8.78359446	0.03419201
2013	GBV	Construction and Mining	29	Trenchers	250	452.704995	21.54676325	11.2114984	11.2114984	0.04052386
2013	GBV	Construction and Mining	29	Trenchers	500	764.5289534	35.26639553	11.5681331	11.5681331	0.03672475
2013	GBV	Construction and Mining	29	Trenchers	750	344.757478	61.29361883	3.00143433	3.00143433	0.00759822
2013	GBV	Construction and Mining	29	Trenchers	1000	20.36235514	84.63129669	0.12838888	0.12838888	0.00063319
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	50	1358.842406	3.533426938	205.212301	205.212301	0.32706033
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	120	2100.136002	6.947367198	161.308621	161.308621	0.2662792
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	175	523.8578086	14.26083139	19.6019371	19.6019371	0.03068
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	250	279.1950976	18.16363483	8.20229604	8.20229604	0.01273509
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	500	77.89178064	26.99016702	1.53998494	1.53998494	0.00231547
2013	GBV	Construction and Mining	36	Sweepers/Scrubbers	1000	54.58861982	75.66169136	0.38499623	0.38499623	0.00057887