APPENDIX 4.1E

Construction Emissions and Impact Analysis

Construction Phases

Construction of PSEGS is expected to last approximately 33 months (2.75 years). Month 1 will be a pre-construction preparation month, with actual physical construction occurring for 32 months. The construction will occur in the following four main phases:

- Site preparation;
- Foundation work;
- Construction/installation of major structures, equipment, and linears.

Construction Schedule

The construction sequence for power plant construction includes the following general steps: (1) mobilization, (2) site preparation and grading, (3) foundation construction, (4) major equipment installation including the solar array field and offsite linears (if required), (5) balance of plant construction, (6) testing and commissioning. The typical work week will be approximately 5 days/week, 52 weeks/year, at a range of 8-16 hours/day. This schedule yields approximately 21 work days/month, and 252-260 work days/year.

The total site related acreage is ~3794 acres, i.e., the area inside the fence-line. Only 337.2 acres will actually be graded or have extensive earthwork. The maximum acreage disturbed on any one day during construction (earthwork phase) will be approximately 10% of the total, or approximately 34 acres. The maximum acreage to be disturbed during power block and heliostat installation will be 211 acres, with these disturbance activities related to vehicle movements and heliostat foundation work. The maximum acreage disturbed on any one day during power block and heliostat installation will be 26 acres. Although the site is essentially flat, the site will require minimum grading and leveling prior to construction of the power blocks, support systems, solar array field, and site buildings. Site preparation includes finish grading, excavation of footings and foundations, and backfilling operations. After site preparation is finished, the construction of the foundations and structures is expected to begin. Once the foundations and structures are finished, installation and assembly of the mechanical and electrical equipment are scheduled to commence.

Fugitive dust emissions from the construction of PSEGS will result from:

- Dust entrained during site preparation and finish grading/excavation at the construction site;
- Dust entrained during offsite travel on paved and unpaved surfaces;
- Dust entrained during aggregate and soil loading and unloading operations; and
- Wind erosion of areas disturbed during construction activities.

Combustion emissions during construction will result from:

- Exhaust from the Diesel construction equipment used for site preparation, grading, excavation, and construction of onsite structures;
- Exhaust from water trucks used to control construction dust emissions;
- Exhaust from Diesel-powered welding machines, electric generators, air compressors, and water pumps;
- Exhaust from pickup trucks and Diesel trucks used to transport workers and materials around the construction site;
- Exhaust from Diesel trucks used to deliver concrete, fuel, and construction supplies to the construction site; and,
- Exhaust from automobiles used by workers to commute to the construction site.

To determine the potential worst-case daily construction impacts, exhaust and dust emission rates have been evaluated for each source of emissions. Worst-case daily dust emissions are expected to occur during the first months of construction when site preparation occurs. The worst-case daily exhaust emissions are expected to occur during the middle of the construction schedule during the installation of the major mechanical equipment. Annual emissions are based on the average equipment mix and use rates during the construction period. Daily emissions are derived from the annual values using the estimated construction time frame.

Available Mitigation Measures

The following mitigation measures are proposed to control exhaust emissions from the Diesel heavy equipment used during construction of PSEGS:

- The applicant will have an on-site construction mitigation manager who will be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the proposed construction mitigations will be provided on a periodic basis.
- All unpaved roads and disturbed areas in the project and laydown construction sites will be watered as frequently as necessary to control fugitive dust. The frequency of watering will be on a minimum schedule of three to four times during the daily construction activity period. Watering may be reduced or eliminated during periods of precipitation.
- Onsite vehicle speeds will be limited to <15 miles per hour on unpaved areas within the project construction site.
- The construction site entrance(s) will be posted with visible speed limit signs.
- All construction equipment vehicle tires will be inspected and cleaned as necessary to be free of dirt prior to leaving the construction site via paved roadways.

- Gravel ramps will be provided at the tire cleaning area.
- All unpaved exits from the construction site will be graveled or treated to reduce track-out to public roadways.
- All construction vehicles will enter the construction site through the treated entrance roadways, unless an alternative route has been provided.
- Construction areas adjacent to any paved roadway will be provided with sandbags or other similar measures as specified in the construction Storm Water Pollution Prevention Plan (SWPPP) to prevent runoff to roadways.
- All paved roads within the construction site will be cleaned on a periodic basis (or less during periods of precipitation), to prevent the accumulation of dirt and debris.
- The first 500 feet of any public roadway exiting the construction site will be cleaned on a periodic basis (or less during periods of precipitation), using wet sweepers or air filtered dry vacuum sweepers, when construction activity occurs or on any day when dirt or runoff from the construction site is visible on the public roadways.
- Any soil storage piles and/or disturbed areas that remain inactive for longer than 10 days will be covered, or shall be treated with appropriate dust suppressant compounds.
- All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions will be covered, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to minimize fugitive dust emissions. A minimum freeboard height of two (2) feet will be required on all bulk materials transport.
- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition will remain in place until the soil is stabilized or permanently covered with vegetation.
- Disturbed areas will be re-vegetated as soon as practical.

To mitigate exhaust emissions from construction equipment, the applicant is proposing the following:

- The applicant will work with the construction contractor to utilize to the extent feasible, EPA-ARB Tier 2/Tier 3 engine compliant equipment for equipment over 100 horsepower.
- Insure periodic maintenance and inspections per the manufacturer's specifications.
- Reduce idling time through equipment and construction scheduling.
- Use California low sulfur diesel fuels (<=15 ppmw S).

Estimation of Emissions with Mitigation Measures

Tables 4.1E-1 through 4.1E-3 show the estimated average daily and annual onsite heavy equipment exhaust and fugitive dust emissions. Detailed emission calculations are included in Table 4.1E-5 (33 pages).

Table 4.1E-1 Fugitive Dust Emissions Estimates	PM10	PM2.5
Fugitive Dust Source	Lbs/day	Lbs/day
Onsite Grading/Earthwork/Cut & Fill	9.52	2.0
Onsite Erection Phase	11.39	2.39
Onsite Gas Line	0.11	0.02
Onsite T-Line	0.16	0.03
Onsite Paved Roads	1.04	0.2
Onsite Soil Storage Piles	0.52	0.21
Onsite Unpaved Roads	6.95	0.69
Onsite Concrete Batch Plant	2.09	0.21
Offsite Access Road Construction	*0.27*	*0.06*
Offsite Paved Roads	*7.4*	*1.25*
Offsite Unpaved Roads	*0*	*0*
Offsite Track-out	*0.29*	*0.05*
Fugitive Dust Source	Tons/Period	Tons/Period
Onsite Grading/Earthwork/Cut & Fill	1.51	0.32
Onsite Erection Phase	3.39	0.71
Onsite Gas Line	0.01	0.002
Onsite T-Line	0.02	0.004
Onsite Paved Roads	0.34	0.06
Onsite Soil Storage Piles	0.09	0.04
Onsite Unpaved Roads	2.07	0.21
Onsite Concrete Batch Plant	0.31	0.03
Offsite Access Road Construction	*0.02*	*0.0034*
Offsite Paved Roads	*2.42*	*0.41*
Offsite Unpaved Roads	*0*	*0*
Offsite Track-out	*0.10*	*0.02*
Fugitive Dust Source	Normalized Tons/Year	Normalized Tons/Year
Max Total Onsite Fugitive Dust Emissions	*2.81*	*0.5*
Max Total Offsite Fugitive Dust Emissions	*0.92*	*0.16*

Table 4.1E-2 Construction Exhaust Emissions Estimates (total facility)						
Exhaust Sources, lbs/day	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Power Block/Solar Fields	760.8	396	97.1	1	37.7	37.7
Onsite Support Vehicles	0.17	1.63	0.14	0.0025	0.026	0.026
Offsite Delivery/Hauling	*19.9*	*7.62*	*1.55*	*0.04*	*0.93*	*0.93*
Offsite Worker Travel	*21.9*	*244.9*	*21.0*	*0.45*	*9.32*	*9.32*
Exhaust Sources, Tons/Period	NOx	CO	VOC	SOx	PM10	PM2.5
Onsite Power Block/Solar Fields	263.62	137.2	33.64	0.36	13.07	13.07
Onsite Support Vehicles	0.057	0.563	0.047	0.001	0.009	0.009
Offsite Delivery/Hauling	*6.9*	*2.64*	*0.54*	*0.013*	*0.323*	*0.323*
Offsite Worker Travel	*7.59*	*84.9*	*7.28*	*0.155*	*1.4*	*1.4*
Exhaust Sources, Normalized Tons/Yr	NOx	CO	VOC	SOx	PM10	PM2.5
Max Total Onsite Exhaust Emissions	*95.88*	*50.1*	*12.25*	*0.131*	*4.76*	*4.76*
Max Total Offsite Exhaust Emissions	*5.27*	*31.83*	*2.84*	*0.061*	*0.63*	*0.63*

Table 4.1E-3 presents the estimates of GHGs for the construction phase.

Table 4.1E-3 GHG Construction Emissions Estimates	
Total CO2e, short tons/period	50705
Total CO2e, metric tons/period	46095
Total CO2e, normalized short tons/yr	18438
Total CO2e, normalized metric tons/yr	16762

Analysis of Ambient Impacts from Facility Construction

Ambient air quality impacts from emissions during the construction of PSEGS were estimated using an air quality dispersion modeling analysis. The modeling analysis considers the construction site location, the surrounding topography, and the sources of emissions during construction, including vehicle and equipment exhaust emissions and fugitive dust.

Existing Ambient Levels

As with the modeling analysis of project operating impacts (Section 4.1), monitoring stations delineated in Section 4.1 were used to establish the ambient background levels for the construction impact modeling analysis. Table 4.1-18 showed the maximum concentrations of NO_x, SO_2, CO, PM10, and PM2.5 recorded for 2009 through 2011 at those monitoring stations.

Dispersion Model

As in the analysis of project operating impacts, the USEPA-approved model AERMOD (version12345) was used to estimate ambient impacts from construction activities. A detailed discussion of the AERMOD model and the associated processing programs AERSURFACE, AERMET, and AERMAP is included in Section 4.1.

The emission sources for the construction site were grouped into two categories: exhaust emissions and dust emissions. Combustion equipment exhaust emissions were modeled as 3.048 meter high point sources (exhaust parameters of 750 Kelvin, 64.681 m/s velocity, and 0.1524m diameter) placed at regular intervals. Construction fugitive dust emissions were modeled as area sources with an effective height of 0.5 meters. Short-term impacts were modeled assuming the emissions were located at the two power blocks, the common area, and, for the site preparation phase, the construction and truck staging area. This resulted in seventeen (17) point sources (2 acres/source, located 50-100 meters apart) and area sources approximating the 34 and 26 acre areas discussed above for site preparation and power block and heliostat installation phases, respectively. Annual normalized emissions were spread over the entire facility area containing the power blocks and heliostats consistent with the facility layout, resulting in fifty (50) point sources (located 500 meters apart) and a 3576 acre area source when modeling annual impacts. Combustion and fugitive emissions were assumed to occur for 12 hours/day (8 AM to 8 PM), which represents an average of the workday periods which will fluctuate between 8 and 16 hours per day. The construction impacts modeling analysis used the same meteorological data and other modeling inputs as used for the project operating impact analysis. However, for the construction modeling, only the facility fenceline and nearby downwash receptor grid from the operational impacts modeled were used (both with 50-meter spacing), since maximum impacts will occur in the immediate vicinity of the property boundary. Also, the FASTALL option was used for the construction modeling as footnoted in Section 4.1.8. A detailed discussion of the receptor locations and meteorological data is included in Section 4.1.

To determine the construction impacts on short-term ambient standards (24 hours and less), the estimated worst-case daily onsite construction emission levels shown in Tables 4.1E-1 and 4.1E-1 were used. For pollutants with annual average ambient standards, the annual onsite emission levels shown in Tables 4.1E-1 and 4.1E-2 were used.

Modeling Results

Based on the emission rates of NO_x, SO_2, CO, PM2.5, and PM10, the modeling options, receptor grids, and meteorological data, AERMOD calculates short-term and annual ambient impacts for each pollutant. As mentioned above, the modeled 1-hour, 3-hour 8-hour, and 24-hour ambient impacts are based on the worst-case daily emission rates of NO_x, SO_2, CO, PM2.5, and PM10 while the annual impacts are based on the annual emission rates of these pollutants, both spread over the estimated daily 12 hours of operation.

NO_2 impacts were computed using the ambient ratio method (ARM) with the USEPA default values of 0.80 and 0.75 for the 1-hour and annual NO_2/NO_x ratios, respectively.

The modeling analysis results are shown in Table 4.1E-4. Also included in the table are the maximum background levels that have occurred in the last three years and the resulting total ambient impacts. As shown in Table 4.1E-4, modeled construction impacts for all

modeled pollutants are expected to be below the most stringent state and national standards except for new 1-hour NO_2 national standard. In addition, total combined (modeled plus background) impacts are greater than the 24-hour and annual average PM10 state standards since background pollutant concentrations already exceed these standards in the absence of the construction emissions for PSEGS. For the Federal 24-hour average, the project also exceeds the standard of 150 µg/m³. If background 24-hour PM10 from Indio is used (132 µg/m³), which is closer the project site, modeled plus background would be in compliance at 147.4 µg/m³.

TABLE 4.1E-4 MODELED MAXIMUM CONSTRUCTION IMPACTS

Pollutant	Averaging Time	Maximum Construction Impacts (µg/m³)	Background (µg/m³)	Total Impact (µg/m³)	State Standard (µg/m³)	Federal Standard (µg/m³)
NO_2[a]	1-hr CAAQS 1-hr NAAQS Annual	200.6 200.6 0.7	124.3 97.8 22.6	324.9 298.4 23.3	339 - 57	- 188 100
SO_2	1-hour 3-hour 24-hour	0.33 0.21 0.07	28.6 28.6 13.1	28.9 28.8 13.2	655 - 105	196 1300 -
CO	1-hour 8-hour	131 52	3543 2000	3674 2052	23,000 10,000	40,000 10,000
PM10	24-hour Annual	15.3 0.10	144.8 32.7	160.1 32.8	50 20	150 -
PM2.5	24-hour Annual	3.4 0.05	15.7 7.8	19.1 7.9	- 12	35 15.0

Notes:
[a]ARM applied for 1-hour and annual averages, using USEPA defaults of 0.80 and 0.75 for the 1-hour and annual NO_2/NOx ratios,respectivly.

It should be noted that modeled PSEGS construction impacts are not unusual in comparison to modeled impacts for most construction sites; in practice, construction sites that use good dust suppression techniques and low-emitting vehicles typically would not be expected to cause exceedances of ambient air quality standards. The input and output modeling files are being provided electronically to the appropriate agencies. The construction modeling impact summary is presented in Appendix 4.1B.

Attachment - Detailed Emission Calculations

Table 4.1E-5 Construction Emissions Calculations (33 pages)

Table 4.1E-6 Construction Schedule

Table 4.1E-7 Construction Equipment Schedules

Table 4.1E-8 Construction Manpower Schedules

Table 4.1E-9 Riverside County (SCAQMD) EMFAC Output

Table 4.1E-10 EMFAC Composite EF Calculations

Table 4.1E-5 Construction Emissions Estimates (33 Pages)

Document: 459892-PSEGS-DOC-005
Client: BrightSource Industries Israel
Project: Palen Solar Electric Generating Facility

Const Months: 33
Workdays per month: 21

Qty	Equipment	Fuel	HP	Usage Factor	Load Factor	Daily Operation	Total Equip Months
Solar Field Assembly and Installation (total for 2 plants)							
2 ea	ISO Carrier	Diesel	290 hp	80%	57%	8 hrs/day	48
2 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	16 hrs/day	48
2 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	16 hrs/day	48
2 ea	Yard Tractors	Diesel	250 hp	80%	60%	16 hrs/day	52
6 ea	Grader (CAT 160M AWD)	Diesel	215 hp	80%	61%	8 hrs/day	86
16 ea	Farm Tractors	Diesel	75 hp	80%	55%	8 hrs/day	392
2 ea	35 ton Rough Terrain Crane	Diesel	160 hp	80%	43%	8 hrs/day	52
4 ea	Pylon Insertion Rigs	Diesel	670 hp	80%	62%	8 hrs/day	96
Site Road Work							
2 ea	Grader (CAT 160M AWD)	Diesel	215 hp	80%	61%	8 hrs/day	12
4 ea	Elevating Scraper (CAT)	Diesel	330 hp	80%	72%	8 hrs/day	20
1 ea	Compactor (CAT CP74)	Diesel	160 hp	80%	50%	8 hrs/day	5
1 ea	Paver	Diesel	220 hp	80%	62%	6 hrs/day	4
Concrete Batch Plant							
1 ea	Front End Loader (CAT 980K)	Diesel	369 hp	80%	55%	8 hrs/day	14
20 ea	Concrete Transit Mix Trucks	Diesel	400 hp	80%	62%	8 hrs/day	218
Tower and Boiler Erection (total for 2 plants)							
2 ea	Strand Jack System	Diesel	670 hp	80%	62%	5 hrs/day	12
2 ea	888 Manitowoc Crawler Crane	Diesel	330 hp	80%	43%	8 hrs/day	16
2 ea	120 ton Rough Terrain Picker	Diesel	300 hp	80%	43%	8 hrs/day	18
4 ea	50 ton Rough Terrain Picker	Diesel	190 hp	80%	43%	8 hrs/day	33
2 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day	18
8 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day	54
8 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day	66
12 ea	125 ft Manlift	Diesel	75 hp	80%	46%	8 hrs/day	102
4 ea	Semi Tractor	Diesel	250 hp	80%	62%	8 hrs/day	36
ACC Erection (total for 2 plants)							
2 ea	888 Manitowoc Crawler Crane	Diesel	330 hp	80%	43%	8 hrs/day	16
4 ea	50 ton Rough Terrain Picker	Diesel	190 hp	80%	43%	8 hrs/day	44
2 ea	50,000 lb Forklift	Diesel	230 hp	80%	30%	8 hrs/day	18
2 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day	20
4 ea	40 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day	39
4 ea	60 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day	39
4 ea	85 ft Manlift	Diesel	75 hp	80%	46%	8 hrs/day	42
2 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day	20
2 ea	Semi Tractor	Diesel	250 hp	80%	62%	8 hrs/day	26
4 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day	40
Power Block Erection (total for 2 plants)							
2 ea	888 Manitowoc Crawler Crane	Diesel	330 hp	80%	43%	8 hrs/day	10
2 ea	65 ton Rough Terrain Crane	Diesel	250 hp	80%	43%	8 hrs/day	36
4 ea	35 ton Rough Terrain Crane	Diesel	160 hp	80%	43%	8 hrs/day	93
2 ea	Front End Loader (CAT 980K)	Diesel	369 hp	80%	55%	8 hrs/day	14
2 ea	Excavator, Hydraulic (CAT 318E)	Diesel	120 hp	40%	70%	8 hrs/day	14
2 ea	Compactor (CAT CP74)	Diesel	160 hp	80%	50%	8 hrs/day	12
4 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day	92
4 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day	92
4 ea	40 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day	88
8 ea	60 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day	114
4 ea	85 ft Manlift	Diesel	75 hp	80%	46%	8 hrs/day	53
4 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day	55
4 ea	Semi Tractor	Diesel	250 hp	80%	62%	8 hrs/day	55
Common Area and Switchyard							
1 ea	35 ton Rough Terrain Crane	Diesel	160 hp	80%	43%	8 hrs/day	11
1 ea	Excavator, Hydraulic (CAT 318E)	Diesel	120 hp	40%	70%	8 hrs/day	8
1 ea	Trencher (Vermeer T555)	Diesel	185 hp	35%	60%	8 hrs/day	5
1 ea	Elevating Scraper (CAT)	Diesel	330 hp	80%	72%	8 hrs/day	5
1 ea	Bulldozer (CAT D6N)	Diesel	150 hp	40%	60%	8 hrs/day	9
1 ea	Compactor (CAT CP74)	Diesel	160 hp	80%	50%	8 hrs/day	7
1 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day	6
2 ea	60 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day	22
1 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day	4
1 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day	4
Miscellaneous							
6 ea	Water Trucks (4,000 gallon)	Diesel	250 hp	60%	41%	8 hrs/day	159
6 ea	Dump Truck, 12-16 YD	Diesel	325 hp	40%	38%	8 hrs/day	57
8 ea	Pickup Trucks	Gasoline	250 hp	25%	60%	8 hrs/day	248
12 ea	AWD Gators	Gasoline	25 hp	25%	50%	8 hrs/day	326
2 ea	Diesel Generator, 500 kW	Diesel	730 hp	45%	50%	8 hrs/day	18
8 ea	Diesel Generator, 1250 kW	Diesel	1,750 hp	45%	50%	8 hrs/day	56

Any equip type described under Load Factor as "On Road" on Table E.5-7 were assigned Usage Factors and Load Factors based on the SCAQMD CEQA Handbook data tables.
Load and use factors not counted in Hp-Hr calculations, since these parameters are accounted for in the SCAQMD emissions factors (2013).

Total Equip Days	Hp-Hrs per Day	Total Period Hp-Hrs	Emissions Factors (SCAQMD Offroad Database for 2013) lbs/hp-hr VOC	CO	Nox	SOx	PM10/2.5	CO2	CH4
1008	2320	2338560	0.0008235	0.00433151	0.00588838	8.0426E-06	0.00034397	0.71478726	7.4303E-05
1008	1440	1451520	0.00036498	0.0018134	0.00232311	3.0524E-06	0.0002009	0.26020763	3.2932E-05
1008	2240	2257920	0.00068712	0.00270913	0.00415922	4.5896E-06	0.00037965	0.39125195	6.1998E-05
1092	4000	4368000	0.00065653	0.0018763	0.00578114	5.8697E-06	0.0002405	0.52166926	5.9238E-05
1806	1720	3106320	0.00083826	0.00419732	0.00639624	7.9676E-06	0.0003608	0.70812305	7.5635E-05
8232	600	4939200	0.00176099	0.00599226	0.01030696	9.1632E-06	0.0008983	0.78114508	0.00015889
1092	1280	1397760	0.00058936	0.00275489	0.00443923	5.1658E-06	0.00025438	0.45911188	5.3177E-05
2016	5360	10805760	0.00040205	0.00430746	0.00396039	9.0706E-06	0.00017232	0.80615095	3.6276E-05
17262	*18960*	*30665040*							
252	1720	433440	0.00083826	0.00419732	0.00639624	7.9676E-06	0.0003608	0.70812305	7.5635E-05
420	2640	1108800	0.00090099	0.00256338	0.00819244	9.4276E-06	0.00031628	0.83788089	8.1295E-05
105	1280	134400	0.00072034	0.00327316	0.0053333	6.168E-06	0.00031386	0.54818254	6.4995E-05
84	1320	110880	0.00082868	0.00243221	0.00778747	8.7481E-06	0.00030225	0.77748782	7.477E-05
861	*6960*	*1787520*							
294	2952	867888	0.00050341	0.00147381	0.00484993	6.705E-06	0.00016676	0.59590672	4.5422E-05
4578	3200	14649600	0.00042696	0.00127675	0.0041284	5.2102E-06	0.00013865	0.53082357	3.8524E-05
4872	*6152*	*15517488*							
252	3350	844200	0.00034199	0.00145324	0.00311683	8.2461E-06	9.5303E-05	0.82012413	3.0858E-05
336	2640	887040	0.00041613	0.00117911	0.00397901	5.0479E-06	0.00014037	0.44863548	3.7547E-05
378	2400	907200	0.00046486	0.00202084	0.00313134	3.7217E-06	0.00024895	0.31726514	4.1944E-05
693	1520	1053360	0.00046486	0.00202084	0.00313134	3.7217E-06	0.00024895	0.31726514	4.1944E-05
378	720	272160	0.00036498	0.0018134	0.00232311	3.0524E-06	0.0002009	0.26020763	3.2932E-05
1134	320	362880	0.00195865	0.00550649	0.00506942	6.7115E-06	0.0004794	0.5191612	0.00017673
1386	1120	1552320	0.00068712	0.00270913	0.00415922	4.5896E-06	0.00037965	0.39125195	6.1998E-05
2142	600	1285200	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
756	2000	1512000	0.00055989	0.00153465	0.00494923	7.4957E-06	0.00016495	0.66618161	5.0518E-05
7455	*14670*	*8676360*							
336	2640	887040	0.00041613	0.00117911	0.00397901	5.0479E-06	0.00014037	0.44863548	3.7547E-05
924	1520	1404480	0.00046486	0.00202084	0.00313134	3.7217E-06	0.00024895	0.31726514	4.1944E-05
378	1840	695520	0.00022802	0.00064556	0.00211258	3.471E-06	6.7036E-05	0.30848706	2.0574E-05
420	720	302400	0.00036498	0.0018134	0.00232311	3.0524E-06	0.0002009	0.26020763	3.2932E-05
819	400	327600	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
819	400	327600	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
882	600	529200	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
420	320	134400	0.00195865	0.00550649	0.00506942	6.7115E-06	0.0004794	0.5191612	0.00017673
546	2000	1092000	0.00055989	0.00153465	0.00494923	7.4957E-06	0.00016495	0.66618161	5.0518E-05
840	1120	940800	0.00068712	0.00270913	0.00415922	4.5896E-06	0.00037965	0.39125195	6.1998E-05
6384	*11560*	*6641040*							
210	2640	554400	0.00041613	0.00117911	0.00397901	5.0479E-06	0.00014037	0.44863548	3.7547E-05
756	2000	1512000	0.00041613	0.00117911	0.00397901	5.0479E-06	0.00014037	0.44863548	3.7547E-05
1953	1280	2499840	0.00058936	0.00275489	0.00443923	5.1658E-06	0.00025438	0.45911188	5.3177E-05
294	2952	867888	0.00050341	0.00147381	0.00484993	6.705E-06	0.00016676	0.59590672	4.5422E-05
294	960	282240	0.0009053	0.00431384	0.0056594	7.197E-06	0.0004886	0.61352552	8.1684E-05
252	1280	322560	0.00072034	0.00327316	0.0053333	6.168E-06	0.00031386	0.54818254	6.4995E-05
1932	320	618240	0.00195865	0.00550649	0.00506942	6.7115E-06	0.0004794	0.5191612	0.00017673
1932	1120	2163840	0.00068712	0.00270913	0.00415922	4.5896E-06	0.00037965	0.39125195	6.1998E-05
1848	400	739200	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
2394	400	957600	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
1113	600	667800	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
1155	720	831600	0.00036498	0.0018134	0.00232311	3.0524E-06	0.0002009	0.26020763	3.2932E-05
1155	2000	2310000	0.00055989	0.00153465	0.00494923	7.4957E-06	0.00016495	0.66618161	5.0518E-05
15288	*16672*	*14327208*							
231	1280	295680	0.00058936	0.00275489	0.00443923	5.1658E-06	0.00025438	0.45911188	5.3177E-05
168	960	161280	0.0009053	0.00431384	0.0056594	7.197E-06	0.0004886	0.61352552	8.1684E-05
105	1480	155400	0.00111695	0.00493278	0.00886838	9.252E-06	0.00048506	0.82227397	0.00010078
105	2640	277200	0.00090099	0.00256338	0.00819244	9.4276E-06	0.00031628	0.83788089	8.1295E-05
189	1200	226800	0.00095637	0.00425626	0.00715924	7.7918E-06	0.00040754	0.69250166	8.6291E-05
147	1280	188160	0.00072034	0.00327316	0.0053333	6.168E-06	0.00031386	0.54818254	6.4995E-05
126	720	90720	0.00036498	0.0018134	0.00232311	3.0524E-06	0.0002009	0.26020763	3.2932E-05
462	400	184800	0.00118313	0.00351491	0.00367918	5.0709E-06	0.00031107	0.39225519	0.00010675
84	320	26880	0.00195865	0.00550649	0.00506942	6.7115E-06	0.0004794	0.5191612	0.00017673
84	1120	94080	0.00068712	0.00270913	0.00415922	4.5896E-06	0.00037965	0.39125195	6.1998E-05
1701	*11400*	*1701000*							
3339	2000	6678000	0.00055989	0.00153465	0.00494923	7.4957E-06	0.00016495	0.66618161	5.0518E-05
1197	2600	3112200	0.00055989	0.00153465	0.00494923	7.4957E-06	0.00016495	0.66618161	5.0518E-05
5208	2000	10416000	0.00003402	0.0004062	0.00004104	0.0000006	0.00000642	0.065358	0
6846	200	1369200	0.0003402	0.004062	0.0004104	0.000006	0.0000642	0.65358	0
378	5840	2207520	0.00040461	0.0015561	0.00531507	7.2902E-06	0.00015125	0.72505326	3.6508E-05
1176	14000	16464000	0.00040461	0.0015561	0.00531507	7.2902E-06	0.00015125	0.72505326	3.6508E-05
18144	*26640*	*40246920*							

Construction Totals lbs/period

tons/period\

		Emissions, lbs/construction period				
VOC	CO	Nox	SOx	PM10/2.5	CO2	CH4
1925.8	10129.5	13770.3	18.8	804.4	1671572.9	173.8
529.8	2632.2	3372.0	4.4	291.6	377696.6	47.8
1551.5	6117.0	9391.2	10.4	857.2	883415.6	140.0
2867.7	8195.7	25252.0	25.6	1050.5	2278651.3	258.8
2603.9	13038.2	19868.8	24.7	1120.8	2199656.8	234.9
8697.9	29596.9	50908.2	45.3	4436.9	3858231.8	784.8
823.8	3850.7	6205.0	7.2	355.6	641728.2	74.3
4344.4	46545.3	42795.0	98.0	1862.0	8711073.7	392.0
23344.795	*120105.54*	*171562.51*	*234.48431*	*10778.963*	*20622027*	*2106.3633*
363.3	1819.3	2772.4	3.5	156.4	306928.9	32.8
999.0	2842.3	9083.8	10.5	350.7	929042.3	90.1
96.8	439.9	716.8	0.8	42.2	73675.7	8.7
91.9	269.7	863.5	1.0	33.5	86207.8	8.3
1551.0568	*5371.1571*	*13436.432*	*15.705761*	*582.77505*	*1395854.8*	*139.94939*
436.9	1279.1	4209.2	5.8	144.7	517180.3	39.4
6254.8	18703.9	60479.4	76.3	2031.2	7776353.0	564.4
6691.7488	*19982.964*	*64688.642*	*82.146619*	*2175.9376*	*8293533.2*	*603.78573*
288.7	1226.8	2631.2	7.0	80.5	692348.8	26.0
369.1	1045.9	3529.5	4.5	124.5	397957.6	33.3
421.7	1833.3	2840.7	3.4	225.8	287822.9	38.1
489.7	2128.7	3298.4	3.9	262.2	334194.4	44.2
99.3	493.5	632.3	0.8	54.7	70818.1	9.0
710.8	1998.2	1839.6	2.4	174.0	188393.2	64.1
1066.6	4205.4	6456.4	7.1	589.3	607348.2	96.2
1520.6	4517.4	4728.5	6.5	399.8	504126.4	137.2
846.6	2320.4	7483.2	11.3	249.4	1007266.6	76.4
5813.0571	*19769.657*	*33439.948*	*46.976929*	*2160.2161*	*4090276.3*	*524.50284*
369.1	1045.9	3529.5	4.5	124.5	397957.6	33.3
652.9	2838.2	4397.9	5.2	349.6	445592.5	58.9
158.6	449.0	1469.3	2.4	46.6	214558.9	14.3
110.4	548.4	702.5	0.9	60.8	78686.8	10.0
387.6	1151.5	1205.3	1.7	101.9	128502.8	35.0
387.6	1151.5	1205.3	1.7	101.9	128502.8	35.0
626.1	1860.1	1947.0	2.7	164.6	207581.4	56.5
263.2	740.1	681.3	0.9	64.4	69775.3	23.8
611.4	1675.8	5404.6	8.2	180.1	727470.3	55.2
646.4	2548.8	3913.0	4.3	357.2	368089.8	58.3
4213.3606	*14009.25*	*24455.799*	*32.453068*	*1551.6944*	*2766718.3*	*380.16479*
230.7	653.7	2206.0	2.8	77.8	248723.5	20.8
629.2	1782.8	6016.3	7.6	212.2	678336.8	56.8
1473.3	6886.8	11097.4	12.9	635.9	1147706.2	132.9
436.9	1279.1	4209.2	5.8	144.7	517180.3	39.4
255.5	1217.5	1597.3	2.0	137.9	173161.4	23.1
232.4	1055.8	1720.3	2.0	101.2	176821.8	21.0
1210.9	3404.3	3134.1	4.1	296.4	320966.2	109.3
1486.8	5862.1	8999.9	9.9	821.5	846606.6	134.2
874.6	2598.2	2719.7	3.7	229.9	289955.0	78.9
1133.0	3365.9	3523.2	4.9	297.9	375623.6	102.2
790.1	2347.3	2457.0	3.4	207.7	261948.0	71.3
303.5	1508.0	1931.9	2.5	167.1	216388.7	27.4
1293.3	3545.0	11432.7	17.3	381.0	1538879.5	116.7
10350.183	*35506.605*	*61044.81*	*79.109081*	*3711.3815*	*6792297.7*	*933.88047*
174.3	814.6	1312.6	1.5	75.2	135750.2	15.7
146.0	695.7	912.7	1.2	78.8	98949.4	13.2
173.6	766.6	1378.1	1.4	75.4	127781.4	15.7
249.8	710.6	2270.9	2.6	87.7	232260.6	22.5
216.9	965.3	1623.7	1.8	92.4	157059.4	19.6
135.5	615.9	1003.5	1.2	59.1	103146.0	12.2
33.1	164.5	210.8	0.3	18.2	23606.0	3.0
218.6	649.6	679.9	0.9	57.5	72488.8	19.7
52.6	148.0	136.3	0.2	12.9	13955.1	4.8
64.6	254.9	391.3	0.4	35.7	36809.0	5.8
1465.0858	*5785.5771*	*9919.8879*	*11.493198*	*592.87159*	*1001805.8*	*132.19235*
3738.9	10248.4	33051.0	50.1	1101.5	4448760.8	337.4
1742.5	4776.1	15403.0	23.3	513.4	2073290.4	157.2
354.4	4231.0	427.5	6.2	66.9	680768.9	0.0
465.8	5561.7	561.9	8.2	87.9	894881.7	0.0
893.2	3435.1	11733.1	16.1	333.9	1600569.6	80.6
6661.6	25619.7	87507.3	120.0	2490.2	11937276.9	601.1
13856.33	*53872.015*	*148683.8*	*223.96838*	*4593.7977*	*21635548*	*1176.2335*
67285.6	274402.8	527231.8	726.3	26147.6	66598061.5	5997.1
33.64	137.20	263.62	0.36	13.07	33299.03	3.00

		Emissions, lbs/construction month				
VOC	CO	Nox	SOx	PM10/2.5	CO2	CH4
58.4	307.0	417.3	0.6	24.4	50653.7	5.3
16.1	79.8	102.2	0.1	8.8	11445.4	1.4
47.0	185.4	284.6	0.3	26.0	26770.2	4.2
86.9	248.4	765.2	0.8	31.8	69050.0	7.8
78.9	395.1	602.1	0.7	34.0	66656.3	7.1
263.6	896.9	1542.7	1.4	134.5	116916.1	23.8
25.0	116.7	188.0	0.2	10.8	19446.3	2.3
131.6	1410.5	1296.8	3.0	56.4	263971.9	11.9
707.41802	*3639.5619*	*5198.8639*	*7.1055851*	*326.63525*	*624909.91*	*63.829192*
11.0	55.1	84.0	0.1	4.7	9300.9	1.0
30.3	86.1	275.3	0.3	10.6	28152.8	2.7
2.9	13.3	21.7	0.0	1.3	2232.6	0.3
2.8	8.2	26.2	0.0	1.0	2612.4	0.3
47.001721	*162.76234*	*407.16462*	*0.4759322*	*17.65985*	*42298.629*	*4.2408905*
13.2	38.8	127.6	0.2	4.4	15672.1	1.2
189.5	566.8	1832.7	2.3	61.6	235647.1	17.1
202.78027	*605.54437*	*1960.2619*	*2.4892915*	*65.937502*	*251319.19*	*18.296537*
8.7	37.2	79.7	0.2	2.4	20980.3	0.8
11.2	31.7	107.0	0.1	3.8	12059.3	1.0
12.8	55.6	86.1	0.1	6.8	8721.9	1.2
14.8	64.5	100.0	0.1	7.9	10127.1	1.3
3.0	15.0	19.2	0.0	1.7	2146.0	0.3
21.5	60.6	55.7	0.1	5.3	5708.9	1.9
32.3	127.4	195.6	0.2	17.9	18404.5	2.9
46.1	136.9	143.3	0.2	12.1	15276.6	4.2
25.7	70.3	226.8	0.3	7.6	30523.2	2.3
176.15325	*599.08053*	*1013.3317*	*1.4235433*	*65.461094*	*123947.77*	*15.894025*
11.2	31.7	107.0	0.1	3.8	12059.3	1.0
19.8	86.0	133.3	0.2	10.6	13502.8	1.8
4.8	13.6	44.5	0.1	1.4	6501.8	0.4
3.3	16.6	21.3	0.0	1.8	2384.4	0.3
11.7	34.9	36.5	0.1	3.1	3894.0	1.1
11.7	34.9	36.5	0.1	3.1	3894.0	1.1
19.0	56.4	59.0	0.1	5.0	6290.3	1.7
8.0	22.4	20.6	0.0	2.0	2114.4	0.7
18.5	50.8	163.8	0.2	5.5	22044.6	1.7
19.6	77.2	118.6	0.1	10.8	11154.2	1.8
127.67759	*424.52271*	*741.08482*	*0.9834263*	*47.021042*	*83839.95*	*11.520145*
7.0	19.8	66.8	0.1	2.4	7537.1	0.6
19.1	54.0	182.3	0.2	6.4	20555.7	1.7
44.6	208.7	336.3	0.4	19.3	34779.0	4.0
13.2	38.8	127.6	0.2	4.4	15672.1	1.2
7.7	36.9	48.4	0.1	4.2	5247.3	0.7
7.0	32.0	52.1	0.1	3.1	5358.2	0.6
36.7	103.2	95.0	0.1	9.0	9726.2	3.3
45.1	177.6	272.7	0.3	24.9	25654.7	4.1
26.5	78.7	82.4	0.1	7.0	8786.5	2.4
34.3	102.0	106.8	0.1	9.0	11382.5	3.1
23.9	71.1	74.5	0.1	6.3	7937.8	2.2
9.2	45.7	58.5	0.1	5.1	6557.2	0.8
39.2	107.4	346.4	0.5	11.5	46632.7	3.5
313.64191	*1075.9577*	*1849.8427*	*2.3972449*	*112.46611*	*205827.2*	*28.299408*
5.3	24.7	39.8	0.0	2.3	4113.6	0.5
4.4	21.1	27.7	0.0	2.4	2998.5	0.4
5.3	23.2	41.8	0.0	2.3	3872.2	0.5
7.6	21.5	68.8	0.1	2.7	7038.2	0.7
6.6	29.3	49.2	0.1	2.8	4759.4	0.6
4.1	18.7	30.4	0.0	1.8	3125.6	0.4
1.0	5.0	6.4	0.0	0.6	715.3	0.1
6.6	19.7	20.6	0.0	1.7	2196.6	0.6
1.6	4.5	4.1	0.0	0.4	422.9	0.1
2.0	7.7	11.9	0.0	1.1	1115.4	0.2
44.39654	*175.32052*	*300.60266*	*0.3482787*	*17.965806*	*30357.751*	*4.0058289*
113.3	310.6	1001.5	1.5	33.4	134810.9	10.2
52.8	144.7	466.8	0.7	15.6	62827.0	4.8
10.7	128.2	13.0	0.2	2.0	20629.4	0.0
14.1	168.5	17.0	0.2	2.7	27117.6	0.0
27.1	104.1	355.5	0.5	10.1	48502.1	2.4
201.9	776.4	2651.7	3.6	75.5	361735.7	18.2
419.8888	*1632.4853*	*4505.5696*	*6.7869205*	*139.20599*	*655622.68*	*35.64344*
2039.0	8315.2	15976.7	22.0	792.4	2018123.1	181.7
			lbs/month			

		Emissions, lbs/construction day				
VOC	CO	Nox	SOx	PM10/2.5	CO2	CH4
2.8	14.6	19.9	0.0	1.2	2412.1	0.3
0.8	3.8	4.9	0.0	0.4	545.0	0.1
2.2	8.8	13.6	0.0	1.2	1274.8	0.2
4.1	11.8	36.4	0.0	1.5	3288.1	0.4
3.8	18.8	28.7	0.0	1.6	3174.1	0.3
12.6	42.7	73.5	0.1	6.4	5567.4	1.1
1.2	5.6	9.0	0.0	0.5	926.0	0.1
6.3	67.2	61.8	0.1	2.7	12570.1	0.6
33.686572	*173.31247*	*247.56495*	*0.3383612*	*15.55406*	*29757.615*	*3.0394853*
0.5	2.6	4.0	0.0	0.2	442.9	0.0
1.4	4.1	13.1	0.0	0.5	1340.6	0.1
0.1	0.6	1.0	0.0	0.1	106.3	0.0
0.1	0.4	1.2	0.0	0.0	124.4	0.0
2.2381772	*7.7505874*	*19.388791*	*0.0226634*	*0.8409452*	*2014.2204*	*0.2019472*
0.6	1.8	6.1	0.0	0.2	746.3	0.1
9.0	27.0	87.3	0.1	2.9	11221.3	0.8
9.6562031	*28.835446*	*93.345804*	*0.1185377*	*3.1398811*	*11967.58*	*0.8712637*
0.4	1.8	3.8	0.0	0.1	999.1	0.0
0.5	1.5	5.1	0.0	0.2	574.3	0.0
0.6	2.6	4.1	0.0	0.3	415.3	0.1
0.7	3.1	4.8	0.0	0.4	482.2	0.1
0.1	0.7	0.9	0.0	0.1	102.2	0.0
1.0	2.9	2.7	0.0	0.3	271.9	0.1
1.5	6.1	9.3	0.0	0.9	876.4	0.1
2.2	6.5	6.8	0.0	0.6	727.5	0.2
1.2	3.3	10.8	0.0	0.4	1453.5	0.1
8.3882498	*28.527644*	*48.253893*	*0.0677878*	*3.117195*	*5902.2746*	*0.7568584*
0.5	1.5	5.1	0.0	0.2	574.3	0.0
0.9	4.1	6.3	0.0	0.5	643.0	0.1
0.2	0.6	2.1	0.0	0.1	309.6	0.0
0.2	0.8	1.0	0.0	0.1	113.5	0.0
0.6	1.7	1.7	0.0	0.1	185.4	0.1
0.6	1.7	1.7	0.0	0.1	185.4	0.1
0.9	2.7	2.8	0.0	0.2	299.5	0.1
0.4	1.1	1.0	0.0	0.1	100.7	0.0
0.9	2.4	7.8	0.0	0.3	1049.7	0.1
0.9	3.7	5.6	0.0	0.5	531.2	0.1
6.0798854	*20.215367*	*35.289753*	*0.0468298*	*2.2390973*	*3992.3786*	*0.5485783*
0.3	0.9	3.2	0.0	0.1	358.9	0.0
0.9	2.6	8.7	0.0	0.3	978.8	0.1
2.1	9.9	16.0	0.0	0.9	1656.1	0.2
0.6	1.8	6.1	0.0	0.2	746.3	0.1
0.4	1.8	2.3	0.0	0.2	249.9	0.0
0.3	1.5	2.5	0.0	0.1	255.2	0.0
1.7	4.9	4.5	0.0	0.4	463.2	0.2
2.1	8.5	13.0	0.0	1.2	1221.7	0.2
1.3	3.7	3.9	0.0	0.3	418.4	0.1
1.6	4.9	5.1	0.0	0.4	542.0	0.1
1.1	3.4	3.5	0.0	0.3	378.0	0.1
0.4	2.2	2.8	0.0	0.2	312.2	0.0
1.9	5.1	16.5	0.0	0.5	2220.6	0.2
14.935329	*51.236083*	*88.087749*	*0.1141545*	*5.3555289*	*9801.2954*	*1.3475909*
0.3	1.2	1.9	0.0	0.1	195.9	0.0
0.2	1.0	1.3	0.0	0.1	142.8	0.0
0.3	1.1	2.0	0.0	0.1	184.4	0.0
0.4	1.0	3.3	0.0	0.1	335.2	0.0
0.3	1.4	2.3	0.0	0.1	226.6	0.0
0.2	0.9	1.4	0.0	0.1	148.8	0.0
0.0	0.2	0.3	0.0	0.0	34.1	0.0
0.3	0.9	1.0	0.0	0.1	104.6	0.0
0.1	0.2	0.2	0.0	0.0	20.1	0.0
0.1	0.4	0.6	0.0	0.1	53.1	0.0
2.114121	*8.3485961*	*14.314413*	*0.0165847*	*0.8555146*	*1445.6072*	*0.1907538*
5.4	14.8	47.7	0.1	1.6	6419.6	0.5
2.5	6.9	22.2	0.0	0.7	2991.8	0.2
0.5	6.1	0.6	0.0	0.1	982.4	0.0
0.7	8.0	0.8	0.0	0.1	1291.3	0.0
1.3	5.0	16.9	0.0	0.5	2309.6	0.1
9.6	37.0	126.3	0.2	3.6	17225.5	0.9
19.994705	*77.737395*	*214.55093*	*0.3231867*	*6.6288566*	*31220.128*	*1.6973067*
97.1	396.0	760.8	1.0	37.7	96101.1	8.7
			lbs/day			

Gasoline Vehicle Conversion from Lbs/VMT to Lbs/Hp-hr

Type	HP	Fuel	Avg Speed Onsite mph	Avg VMT/hr	lbsVMT VOC	lbsVMT CO	EMFAC V2.3, 2007 lbsVMT Nox	lbsVMT SOx	lbsVMT PM10/2.5	lbsVMT CO2
Pickup Trucks	250	Gasoline	15	15	0.000567	0.00677	0.000684	0.00001	0.000107	1.0893
AWD Gators	25	Gasoline	15	15	0.000567	0.00677	0.000684	0.00001	0.000107	1.0893

	lbs/hr VOC	lbs/hr CO	lbs/hr Nox	lbs/hr SOx	lbs/hr PM10/2.5	lbs/hr CO2
Pickup Trucks	0.008505	0.10155	0.01026	0.00015	0.001605	16.3395
AWD Gators	0.008505	0.10155	0.01026	0.00015	0.001605	16.3395

	lbs/hp-hr	lbs/hp-hr	lbs/hp-hr	lbs/hp-hr	lbs/hp-hr	lbs/hp-hr
Pickup Trucks	0.00003402	0.0004062	0.00004104	0.0000006	0.00000642	0.065358
AWD Gators	0.0003402	0.004062	0.0004104	0.000006	0.0000642	0.65358

CONSTRUCTION PHASE - Site Prep (Grading) for Both Power Blocks and Solar Field Roads (All Phases)
MRI Level 2 Analysis (Refs 1, 3-7)

Acres Subject to Construction Grading/Earthwork Disturbance Activites:		337.2	
Max Acres Subject to Construction Disturbance Activites on any day:		34	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	10	
	Days/Wk:	5	
	Days/Month:	21	
	Const Period, Months:	16	1.3 years
	Const Period, Days:	336	
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)		
	Mean # days/year with rain > = 0.01 inch:	20	
	Mean # months/yr with rain > = 0.01 inch:	0.67	
	Adjusted Const Period, Months:	15.11	
	Adjusted Const Period, Days:	309	
Controls for Fugitive Dust:			
	Proposed watering cycle:	3	times per day

SCAQMD Mitigation Measures, Table XI-A, 4/07
3 watering cycles/10 hour construction shift yields a 61% reduction, 2 watering cycles/10 hour shift should yield a 40%+ reduction.
Speed control of onsite const traffic from 35 to 15 mph yields a 57% reduction (use 50% control as conservative in desert area).

Calculated % control based on mitigations proposed:	81	% control
Conservative control % used for emissions estimates:	80	% control
	0.2	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.098	0.021
tons/period	1.480	0.311
Max lbs/day	9.3	1.958

Soil Handling Emissions (Cut and Fill): (2)

Total cu.yds of soil handled:		213067	Mean annual wind speed, mph:		7.8
Total tons of soil handled:		550991.262	Avg. Soil moisture, %:		5
Total days soil handled:		309	Avg. Soil density, tons/cu.yd:		1.3
Tons soil/day:		1781	k factor for PM10:		0.35
Control Eff, watering, %		80	Number of Drops per ton:		2
	Release Fraction:	0.2	Calc 1	wind	1.783
			Calc 2	moisture	3.607
Emissions:	PM10	PM2.5	Calc 3	int	0.494
tons/period	0.03	0.01	Calc 4	PM10 lb/ton	0.0006
tons/month	0.00	0.00	PM2.5 fraction of PM10:		0.210
max lbs/day	0.20	0.04			

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**1.5110**	**0.3173**
tons/month	**0.1000**	**0.0210**
max lbs/day	**9.52**	**2.00**

Methodology References:

(1) MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 210 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
(2) Soil Handling (Cut and Fill), EPA, AP-42, Section 13.2.4., 11/06, and Appendix E-2, Palen Solar PP, 8/09.
(3) URBEMIS, Version 9.2.4, User's Manual Appendix A, page A-6.
(4) CARB Area Source Methodology, Section 7.7, 9/02.
(5) WRAP Fugitive Dust Handbook, 9/06.
(6) USEPA, AP-42, Section 13.2.3, 2/10.
(7) Estimating PM Emissions from Construction Operations, USEPA, MRI, 9/99.
(8) Wind speed data for Blythe AP, 2002-2004.
(9) Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg
(10) Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.

CONSTRUCTION PHASE- Erection Phase for Both Power Blocks and Fields (No earthmoving activity)
MRI Level 2 Analysis (Refs 1, 3-7)

Acres Subject to Construction Disturbance Activites:		260	
Max Acres Subject to Construction Disturbance Activites on any day:		26	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.023	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	16	
	Days/Wk:	5	
	Days/Month:	21	
	Const Period, Months:	30	2.5 years
	Const Period, Days:	630	
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)		
	Mean # days/year with rain > = 0.01 inch:	20	
	Mean # months/yr with rain > = 0.01 inch:	0.67	
	Adjusted Const Period, Months:	28.33	
	Adjusted Const Period, Days:	580	
Controls for Fugitive Dust:			
	Proposed watering cycle:	3	times per day

SCAQMD Mitigation Measures, Table XI-A, 4/07
3 watering cycles/10 hour construction shift yields a 61% reduction, 2 watering cycles/10 hour shift should yield a 40%+ reduction.
Speed control of onsite const traffic from 35 to 15 mph yields a 57% reduction (use 50% control as conservative in desert area).

Calculated % control based on mitigations proposed:	81	% control
Conservative control % used for emissions estimates:	80	% control
	0.2	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.120	0.025
tons/period	3.389	0.712
Max lbs/day	11.4	2.392

Soil Handling Emissions (Cut and Fill): (2)

Total cu.yds of soil handled:		0	Mean annual wind speed, mph:		7.8
Total tons of soil handled:		0	Avg. Soil moisture, %:		5
Total days soil handled:		580	Avg. Soil density, tons/cu.yd:		1.3
Tons soil/day:		0	k factor for PM10:		0.35
Control Eff, watering, %		80	Number of Drops per ton:		4
Release Fraction:		0.2	Calc 1	wind	1.783
			Calc 2	moisture	3.607
Emissions:	PM10	PM2.5	Calc 3	int	0.494
tons/period	0.00	0.00	Calc 4	PM10 lb/ton	0.0006
tons/month	0.00	0.00	PM2.5 fraction of PM10:		0.210
max lbs/day	0.00	0.00			

Emissions Totals:	**PM10**	**PM2.5**
tons/period	**3.3887**	**0.7116**
tons/month	**0.1196**	**0.0251**
max lbs/day	**11.39**	**2.39**

Methodology References:

(1) MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 336 hrs/month, the adjusted EF would be 0.023 tons/acre/month.
(2) Soil Handling (Cut and Fill), EPA, AP-42, Section 13.2.4., 11/06, and Appendix E-2, Palen Solar PP, 8/09.
(3) URBEMIS, Version 9.2.4, User's Manual Appendix A, page A-6.
(4) CARB Area Source Methodology, Section 7.7, 9/02.
(5) WRAP Fugitive Dust Handbook, 9/06.
(6) USEPA, AP-42, Section 13.2.3, 2/10.
(7) Estimating PM Emissions from Construction Operations, USEPA, MRI, 9/99.
(8) Wind speed data for Blythe AP, 2002-2004.
(9) Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg
(10) Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.

CONSTRUCTION PHASE - Access Road Construction
MRI Level 2 Analysis (Refs 1, 3-7)

Acres Subject to Construction Disturbance Activites:	7.6	1.25 mi length by 50 ft ROW
Max Acres Subject to Construction Disturbance Activites on any day:	1.00	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:	0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):	0.21	
Activity Levels: Hrs/Day:	10	
Days/Wk:	5	
Days/Month:	21	
Const Period, Months:	6	0.5 years
Const Period, Days:	126	
Wet Season Adjustment: (Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)		
Mean # days/year with rain > = 0.01 inch:	20	
Mean # months/yr with rain > = 0.01 inch:	0.67	
Adjusted Const Period, Months:	5.67	
Adjusted Const Period, Days:	116	
Controls for Fugitive Dust:		
Proposed watering cycle:	3	times per day

SCAQMD Mitigation Measures, Table XI-A, 4/07
3 watering cycles/10 hour construction shift yields a 61% reduction, 2 watering cycles/10 hour shift should yield a 40%+ reduction.
Speed control of onsite const traffic from 35 to 15 mph yields a 57% reduction (use 50% control as conservative in desert area).

Calculated % control based on mitigations proposed:	81	% control
Conservative control % used for emissions estimates:	80	% control
	0.2	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.003	0.001
tons/period	0.016	0.003
Max lbs/day	0.3	0.058

Soil Handling Emissions (Cut and Fill): (2)

Total cu.yds of soil handled:		0	Mean annual wind speed, mph:			7.8
Total tons of soil handled:		0	Avg. Soil moisture, %:			5
Total days soil handled:		116	Avg. Soil density, tons/cu.yd:			1.3
Tons soil/day:		0	k factor for PM10:			0.35
Control Eff, watering, %		80	Number of Drops per ton:			2
Release Fraction:		0.2	Calc 1	wind		1.783
			Calc 2	moisture		3.607
Emissions:	PM10	PM2.5	Calc 3	int		0.494
tons/period	0.00	0.00	Calc 4	PM10	lb/ton	0.0006
tons/month	0.00	0.00	PM2.5 fraction of PM10:			0.210
max lbs/day	0.00	0.00				

Emissions Totals:

	PM10	**PM2.5**
tons/period	**0.0163**	**0.0034**
tons/month	**0.0029**	**0.0006**
max lbs/day	**0.27**	**0.06**

Methodology References:

(1) MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 210 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
(2) Soil Handling (Cut and Fill), EPA, AP-42, Section 13.2.4., 11/06, and Appendix E-2, Palen Solar PP, 8/09.
(3) URBEMIS, Version 9.2.4, User's Manual Appendix A, page A-6.
(4) CARB Area Source Methodology, Section 7.7, 9/02.
(5) WRAP Fugitive Dust Handbook, 9/06.
(6) USEPA, AP-42, Section 13.2.3, 2/10.
(7) Estimating PM Emissions from Construction Operations, USEPA, MRI, 9/99.
(8) Wind speed data for Blythe AP, 2002-2004.
(9) Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg
(10) Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.
(11) paved road will be 2-12 ft lanes, 24 ft wide with minimal shoulders in a 50 ft ROW

CONSTRUCTION PHASE - Underground Gas Line

MRI Level 2 Analysis (Refs 1, 3-7)

Acres Subject to Construction Disturbance Activites:		3.82	
Max Acres Subject to Construction Disturbance Activites on any day:		0.38	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	10	
	Days/Wk:	5	
	Days/Month:	21	
	Const Period, Months:	8	0.7 years
	Const Period, Days:	168	
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)		
	Mean # days/year with rain > = 0.01 inch:	20	
	Mean # months/yr with rain > = 0.01 inch:	0.67	
	Adjusted Const Period, Months:	7.56	
	Adjusted Const Period, Days:	155	
Controls for Fugitive Dust:			
	Proposed watering cycle:	3	times per day

SCAQMD Mitigation Measures, Table XI-A, 4/07

3 watering cycles/10 hour construction shift yields a 61% reduction, 2 watering cycles/10 hour shift should yield a 40%+ reduction.

Speed control of onsite const traffic from 35 to 15 mph yields a 57% reduction (use 50% control as conservative in desert area).

Calculated % control based on mitigations proposed:	81	% control
Conservative control % used for emissions estimates:	80	% control
	0.2	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.001	0.000
tons/period	0.008	0.002
Max lbs/day	0.1	0.022

Soil Handling Emissions (Cut and Fill): (2)

Total cu.yds of soil handled:		5400	Mean annual wind speed, mph:			7.8
Total tons of soil handled:		13964.4	Avg. Soil moisture, %:			5
Total days soil handled:		155	Avg. Soil density, tons/cu.yd:			1.3
Tons soil/day:		90	k factor for PM10:			0.35
Control Eff, watering, %		80	Number of Drops per ton:			2
Release Fraction:		0.2	Calc 1	wind		1.783
			Calc 2	moisture		3.607
Emissions:	PM10	PM2.5	Calc 3	int		0.494
tons/period	0.00	0.00	Calc 4	PM10	lb/ton	0.0006
tons/month	0.00	0.00	PM2.5 fraction of PM10:			0.210
max lbs/day	0.01	0.00				

Fraction of gas line onsite: 0.97

Emissions Totals:

	PM10	**PM2.5**
tons/period	**0.0091**	**0.0019**
tons/month	**0.0012**	**0.0003**
max lbs/day	**0.11**	**0.02**

Methodology References:

(1) MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 210 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
(2) Soil Handling (Cut and Fill), EPA, AP-42, Section 13.2.4., 11/06, and Appendix E-2, Palen Solar PP, 8/09.
(3) URBEMIS, Version 9.2.4, User's Manual Appendix A, page A-6.
(4) CARB Area Source Methodology, Section 7.7, 9/02.
(5) WRAP Fugitive Dust Handbook, 9/06.
(6) USEPA, AP-42, Section 13.2.3, 2/10.
(7) Estimating PM Emissions from Construction Operations, USEPA, MRI, 9/99.
(8) Wind speed data for Blythe AP, 2002-2004.
(9) Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg
(10) Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.
(11) acreage based on trench ROW dimensions, cut and fill based on trench dimensions

CONSTRUCTION PHASE - Underground T-Line
MRI Level 2 Analysis (Refs 1, 3-7)

Acres Subject to Construction Disturbance Activites:		3.35	
Max Acres Subject to Construction Disturbance Activites on any day:		0.34	
Emissions Factor for PM10 Uncontrolled, tons/acre/month:		0.0144	
PM2.5 fraction of PM10 (per CARB CEIDARS Profiles):		0.21	
Activity Levels:	Hrs/Day:	10	
	Days/Wk:	5	
	Days/Month:	21	
	Const Period, Months:	11	0.9 years
	Const Period, Days:	231	
Wet Season Adjustment:	(Per AP-42, Section 13.2.2, Figure 13.2.2-1, 12/03)		
	Mean # days/year with rain > = 0.01 inch:	20	
	Mean # months/yr with rain > = 0.01 inch:	0.67	
	Adjusted Const Period, Months:	10.39	
	Adjusted Const Period, Days:	213	
Controls for Fugitive Dust:			
	Proposed watering cycle:	3	times per day

SCAQMD Mitigation Measures, Table XI-A, 4/07
3 watering cycles/10 hour construction shift yields a 61% reduction, 2 watering cycles/10 hour shift should yield a 40%+ reduction.
Speed control of onsite const traffic from 35 to 15 mph yields a 57% reduction (use 50% control as conservative in desert area).

Calculated % control based on mitigations proposed:	81	% control
Conservative control % used for emissions estimates:	80	% control
	0.2	release fraction

Emissions: Controlled	PM10	PM2.5
tons/month	0.001	0.000
tons/period	0.010	0.002
Max lbs/day	0.1	0.020

Soil Handling Emissions (Cut and Fill): (2)

Total cu.yds of soil handled:		49363	Mean annual wind speed, mph:			7.8
Total tons of soil handled:		127652.718	Avg. Soil moisture, %:			5
Total days soil handled:		213	Avg. Soil density, tons/cu.yd:			1.3
Tons soil/day:		600	k factor for PM10:			0.35
Control Eff, watering, %		80	Number of Drops per ton:			2
	Release Fraction:	0.2	Calc 1	wind		1.783
			Calc 2	moisture		3.607
Emissions:	PM10	PM2.5	Calc 3	int		0.494
tons/period	0.01	0.00	Calc 4	PM10	lb/ton	0.0006
tons/month	0.00	0.00	PM2.5 fraction of PM10:			0.210
max lbs/day	0.07	0.01				

Fraction of T-line onsite: 1.00

Emissions Totals:

	PM10	**PM2.5**
tons/period	**0.0174**	**0.0037**
tons/month	**0.0017**	**0.0004**
max lbs/day	**0.16**	**0.03**

Methodology References:

(1) MRI Report, South Coast AQMD Project No. 95040, March 1996, Level 2 Analysis Procedure.
MRI Report factor of 0.011 tons/acre/month is based on 168 hours per month of const activity.
For an activity rate of 210 hrs/month, the adjusted EF would be 0.0144 tons/acre/month.
(2) Soil Handling (Cut and Fill), EPA, AP-42, Section 13.2.4., 11/06, and Appendix E-2, Palen Solar PP, 8/09.
(3) URBEMIS, Version 9.2.4, User's Manual Appendix A, page A-6.
(4) CARB Area Source Methodology, Section 7.7, 9/02.
(5) WRAP Fugitive Dust Handbook, 9/06.
(6) USEPA, AP-42, Section 13.2.3, 2/10.
(7) Estimating PM Emissions from Construction Operations, USEPA, MRI, 9/99.
(8) Wind speed data for Blythe AP, 2002-2004.
(9) Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg
(10) Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.
(11) acreage based on trench ROW dimensions, cut and fill based on trench dimensions

OFFSITE PAVED ROAD FUGITIVE DUST EMISSIONS
(associated with delivery truck and worker vehicle traffic on I-10 and plant access road)

Average mileage for construction related vehicles:		75	miles, roundtrip distance***
Avg weight of vehicular equipment on road:		3.5	tons (range 2 - 42 tons)
Road surface silt loading factor:		0.03	g/m2 (range 0.03 - 400 g/m2)
			Limited Access Freeway >10,000 ADT (I-10)
Particle size multiplier factors:	PM10	0.016	lb/VMT
	PM2.5	0.0024	lb/VMT
C factors (brake and tire wear):	PM10	0.00047	lb/VMT
	PM2.5	0.00036	lb/VMT
Avg vehicle speed on road:		65	mph
Number of vehicles per day:		621	*
Number of work days per month:		21	
Total vehicles per month:		13041	
Number of work months:		31.2	adjusted for precip events
Total vehicles per const period:		406879.2	

		VMT/day:	46575
		VMT/month:	978075
		VMT/period:	30515940

	PM10	
Calc 1	0.035	
Calc 2	1.131	
Calc 3	0.0002	lb/VMT

Emissions	PM10	PM2.5
lbs/day	7.40	1.25
lbs/month	155.37	26.26
lbs/period	4847.61	819.25
tons/period	2.42	0.41

*see vehicle total on Weight tab
EPA, AP-42, Section 13.2.1, March 2006, updated 9/2008.
PM2.5 fraction of PM10 per CARB CEIDARs is 0.169
*** Note: avg roundtrip distance traveled by delivery or worker vehicles on limited access freeways (I-10)
Delivery Route: from Blythe urban area or Blythe ATSF railyard to site, includes plant paved access road

ONSITE PAVED ROAD FUGITIVE DUST EMISSIONS
(associated with construction equipment traffic)

Length of Paved Road used for/by Construction Access:		6.3	miles*		
Avg weight of construction vehicular equipment on road:		10	tons (range 2 - 42 tons)		
Road surface silt loading factor:		0.06	g/m2 (range 0.03 - 400 g/m2)		
Particle size multiplier factors:	PM10	0.016	lb/VMT		
	PM2.5	0.0024	lb/VMT		
C factors (brake and tire wear):	PM10	0.00047	lb/VMT		
	PM2.5	0.00036	lb/VMT		
Avg construction vehicle speed on onsite road:		15	mph (range 10-55 mph)		
Number of construction vehicles per day:		80	**	VMT/day:	504
				VMT/month:	10584
Number of construction work days per month:		21		VMT/period:	330220.8
Total vehicles per month:		1680			
Number of construction work months:		31.2	adjusted for precip events		
Total vehicles per const period:		52416			

	PM10	
Calc 1	0.060	
Calc 2	2.620	
Calc 3	0.0021	lb/VMT

Emissions	PM10	PM2.5
lbs/day	1.04	0.18
lbs/month	21.86	3.70
lbs/period	682.18	115.29
tons/period	0.34	0.06

*total mileage of onsite paved roads. Since these roads will be used to access the power block areas and portions of the heliostat fields under installation, it was assumed that all of these roads would be used on an average daily basis.
** delivery vehicles plus onsite const support equipment, worker vehicles will not be traversing the site
EPA, AP-42, Section 13.2.1, March 2006, updated 9/2008.
PM2.5 fraction of PM10 per CARB CEIDARs is 0.169

Fugitive Dust from Wind Erosion of Soil Storage Piles

Grading Phase Only for both Power Blocks and Solar Fields

Avg acres of soil storage piles exposed per day:	5	*	
Soil silt content, %:	18.3		0.183
Number of days/year with precipitation >0.01 inches:	20		
Annual % of time wind speed greater than 12 mph:	20.6		0.206
Watering control efficiency, %:	80		0.8
PM10 aerodynamic factor:	0.5		
PM2.5 aerodynamic factor:	0.2		
Total construction period exposure time, days:	336		

	lb/acre-day	lbs/day	lbs/period	tons/period
PM10	0.104	0.520	174.6	0.087
PM2.5	0.042	0.208	69.9	0.035

MDAQMD, Emissions Inventory Guidance, Mineral Handling and Processing Industries, April 2000.
USEPA, AP-42, Section 13.2.2, Unpaved Roads, Figure 13.2.2-1, Thornethwaite Precipitation Data.
*soil storage areas only, open cut and fill areas are not soil storage areas.

ONSITE UNPAVED ROAD FUGITIVE DUST

Length of Unpaved Road used for/by Construction Access: (in the heliostat fields)	2	miles*
Avg weight of construction vehicular equipment on road:	10	tons (range 2 - 42 tons)
Road surface silt content:	18	% (range 1.8 - 35%)
Road surface material moisture content:	5	% (range 0.03 - 13%)

		k	a	c	d
Particle size multiplier factors:	PM10	1.8	1	0.2	0.5
	PM2.5	0.18	1	0.2	0.5

C factors (brake and tire wear):	PM10	0.00047	lb/VMT
	PM2.5	0.00036	lb/VMT

Avg construction vehicle speed on road:	5	mph (range 5-55 mph)

Number of construction vehicles per day:	25	**	VMT/day:	50
			VMT/month:	1050
Number of construction work days per month:	21		VMT/period:	29746.5
Total vehicles per month:	525			
Number of construction work months:	28.33	adjusted for precipitation events		
Total vehicles per const period:	14873.25			
Control reduction due to watering, speed control, etc. =	80			
	0.8			
Release Fraction =	0.2			

	PM10	PM2.5
Calc 1	1.500	1.500
Calc 2	0.408	0.408
Calc 3	1.585	1.585
Calc 4	0.695	0.070
Uncontrolled lb/VMT	0.695	0.069

Emissions	PM10	PM2.5
lbs/day	6.95	0.69
lbs/month	145.95	14.53
lbs/period	4134.86	411.62
tons/period	2.07	0.21

EPA, AP-42, Section 13.2.2, March 2006
Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.
Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg, for road sfc used 8.5% per EPA-AP42
*total mileage of onsite unpaved roads is 19.8 miles, but less than 10% will be used on any given day during installation
** heliostat installation equipment, avg daily value

OFFSITE UNPAVED ROAD FUGITIVE DUST

Length of Unpaved Road used for/by Construction Access:		0	miles*		
Avg weight of construction vehicular equipment on road:		0	tons (range 2 - 42 tons)		
Road surface silt content:		18	% (range 1.8 - 35%), rolled gravel surface		
Road surface material moisture content:		5	% (range 0.03 - 13%)		
		k	a	c	d
Particle size multiplier factors:	PM10	1.8	1	0.2	0.5
	PM2.5	0.18	1	0.2	0.5
C factors (brake and tire wear):	PM10	0.00047	lb/VMT		
	PM2.5	0.00036	lb/VMT		
Avg construction vehicle speed on road:		15	mph (range 10-55 mph)		
Number of construction vehicles per day:		0	**	VMT/day:	0
				VMT/month:	0
Number of construction work days per month:		0		VMT/period:	0
Total vehicles per month:		0			
Number of construction work months:		0			
Total vehicles per const period:		0			
Control reduction due to watering, speed control, etc. =		80			
		0.8			
Release Fraction =		0.2			

	PM10	PM2.5
Calc 1	1.500	1.500
Calc 2	0.707	0.707
Calc 3	1.585	1.585
Calc 4	1.205	0.120
Uncontrolled lb/VMT	1.204	0.120

Emissions	PM10	PM2.5
lbs/day	0.00	0.00
lbs/month	0.00	0.00
lbs/period	0.00	0.00
tons/period	0.00	0.00

EPA, AP-42, Section 13.2.2, March 2006
Soil Moisture; 5% avg, USGS, OFR-02-348, ADRS, 2002.
Soil data: AECOM BSPP, App E.2, 8/09. DR-Air-3, 1-6-10, Silt content-18% avg
*no offsite unpaved roads will be used during construction
** delivery and worker vehicles plus support staff

CONSTRUCTION PHASE - Trackout Emissions

Paved Road Length (miles):	0.1	estimated roundtrip trackout distance			
Daily # of Vehicles:	50				
Avg Vehicle Weight (tons):	23.0		**PM10**	**PM2.5***	
Total Unadjusted VMT/day	5.0		0.361		
Particle Size Multipliers	PM10		5.101		
lb/VMT	0.023		0.008	0.0014	lb/VMT
C factor, lb/VMT	0.00047		0.293	0.0496	**lbs/day**
Road Sfc Silt Loading (g/m^2):	0.56	local X 2	0.003	0.0005	**tons/month**
# of Active Trackout Points:	1	**	0.10	0.0162	**tons/period**
Added Trackout Miles:	PM10				
Trackout VMT/day:	30		*Default Silt Load Values for Paved Road Types*		
Final Adjusted VMT/day	35		Freeway	0.02 g/m2	
Final Adjusted VMT/month	735		Arterial	0.036 g/m2	
Final Adjusted VMT/period	22932		Collector	0.036 g/m2	
Construction days/month:	21		Local	0.28 g/m2	
Adj. Construction months/period:	31.20		Rural	1.6 g/m2	
Control Applied to Trackout:	Sweeping and Cleaning (water washing)				
Control Efficiency, %	80	0.8	Release Factor =	0.2	

* PM2.5 fraction of PM10 assumed to be 0.169 (CARB CEIDARS updated fraction values) for paved roads.
** 1 controlled ingress/egress point is planned for site construction
EPA, AP-42, Section 13.2.1, Proposed revisions dated 9/2008.
Use silt loading factor from default values for road type if no site specific data is available.
Trackout effects approximately 0.05 mi. of roadway arriving and departing from the site access point.
Plant access road will be paved prior to main site construction period.
Vehicle count = delivery trucks plus 10 misc support vehicles X 2
Worker vehicles not counted for trackout, as they do not access main site.

Onsite Concrete Batch Plant Emissions Estinates

Ref: AP-42, Section 11.12, June 2006
EFs from Table 11.12-6, Central Mix Plant Type

Months concrete batch plant onsite:	14	months 4-17	
Avg workdays per month:	21		
Total concrete production workdays/period:	294		
Total deliveries per period:	3488		
Avg truck capacity, cu.yds:	9		
Total concrete produced onsite per period:	31392	cu.yds.	
Proposed controls: water spray, drop point enclosures, covered conveyors			
Controlled PM10 EF for raw materials input:	0.0153	lbs/cu.yd	
Central Mix Plant EF:	0.0043146	lbs/cu.yd	Eq. 11.12-2

Total EF: 0.0196 lbs/cu.yd.

			PM2.5
Period PM10 Emissions:	615.7	lbs	62.8
	0.31	tons	0.03

			PM2.5
Avg daily PM10 Emissions:	2.09	lbs	0.21

Total site concrete requirements:	58000	cu.yds.
Onsite:	31392	cu.yds.
Offsite:	26608	cu.yds.

CONSTRUCTION PHASE - Truck Hauling/Delivery and Site Support Vehicle Emissions

All Phases

Delivery/Hauling Vehicle Use Rates

Delivery Roundtrip Distance:	75	miles
Const Days per Period:	693	
Avg Deliveries per Day:	15	
Fraction of Deliveries-Diesel:	0.85	HDDT
Fraction of Deliveries-Gas:	0.15	MDGT
Total Delivery VMT:	779625	
Total Daily VMT-Diesel	956	
Total Daily VMT-Gasoline	169	
Total Period VMT-Diesel	662681.25	
Total Period VMT-Gasoline	116943.75	

Emissions Factors (lbs/vmt)

NOx	CO	VOC	SOx	PM10	CO2	
0.020568	0.006521	0.001482	0.000037	0.000958	4.0073	HDDT
0.001246	0.00818	0.000772	0.000015	0.000108	1.4979	MDGT

Daily Emissions (lbs)

NOx	CO	VOC	SOx	PM10	CO2	PM2.5	
19.668	**6.236**	**1.417**	**0.035**	**0.916**	**3831.981**	**0.908**	HDDT
0.210	1.380	0.130	0.003	0.018	252.771	0.018	MDGT

Tons per Const Period

6.815	2.161	0.491	0.012	0.317	1327.8	0.315	HDDT
0.073	0.478	0.045	0.001	0.006	87.6	0.006	MDGT

Construction Site Support Vehicle Use Rates (LDTs)

Gasoline Vehicle VMT Period:	166320
Avg Daily Gasoline VMT:	240
Diesel Vehicle VMT Period:	34650
Avg Daily Diesel VMT:	50
Total Phase Const Days:	693

Daily Emissions, lbs

NOx	CO	VOC	SOx	PM10	CO2			PM2.5
0.000684	0.00677	0.000567	0.00001	0.000107	1.0893	lbs/vmt*	LDT gasoline	
0.000035	0.000013	0.000002	0.000001	0.000002	0.0084	lbs/vmt*	LDT diesel	
0.1642	**1.6248**	**0.1361**	**0.0024**	**0.0257**	**261.4320**	**lbs/day**	**gasoline**	**0.0256**
0.0018	**0.0007**	**0.0001**	**0.0001**	**0.0001**	**0.4200**	**lbs/day**	**diesel**	**0.0001**

Tons per Const Period

0.0569	0.5630	0.0472	0.0008	0.0089	90.6	**tons/period**	**gasoline**	0.0089
0.0006	0.0002	0.0000	0.0000	0.0000	0.1	**tons/period**	**diesel**	0.0000

Ref: Riverside County, Emfac 2007, V2.3, Nov 2006
On-Road Heavy Duty Diesels (1970-2014)
On Road Medium Duty Gas (1970-2014)
LDTs (1970-2014)

Notes ***

VMT for delivery/hauling for all vehicles includes: (1) materials deliveries to site, (2) materials removal from site, other VMT as specified below.
Support Vehicle VMT: best estimate at time of filing, 8 gasoline LDTs at 30 miles per day each, and 2 diesel LDTs at 25 miles per day each.
Delivery Route: Blythe urban or railyard area to site, 75 miles roundtrip.
CARB-CEIDARS, Updated Fractions for PM Profiles: PM2.5 = 0.991 of PM10 for Diesel Exhaust, and 0.998 for Gasoline Vehicles.
Const days per period: 21 days per month at 33 months = 693

CONSTRUCTION PHASE - Worker Travel - Emissions

Ref: Riverside County, Emfac 2007, V2.3, Nov 2006
On Road Vehicles (1970-2014)
LDP/LDT Weighted Avg Efs

All Phases

Worker Travel to Site

Avg Occupancy/Vehicle:	1	
Avg Roundtrip Distance, miles:	75	
Avg # of Worker Vehicles, per day:	596	*
Avg Daily Worker VMT:	44700	
Max # of Worker Vehicles, per day:	1380	*
Max Daily Worker VMT:	103500	
Total Const Days:	693	
Total Const Period Worker VMT:	30977100	

Emissions Factors (lbs/VMT)

NOx	CO	VOC	SOx	PM10	CO2
0.00049	0.00548	0.00047	0.00001	0.00009	0.95934

Daily Emissions (lbs)

	NOx	CO	VOC	SOx	PM10	CO2	PM2.5
Avg	21.90	244.96	21.01	0.45	4.02	42882.50	4.01
Max	50.72	567.18	48.65	1.04	9.32	99291.69	9.30

Tons per Const Period

Avg	7.589	84.877	7.280	0.155	1.394	14858.8	1.391

Worker Travel by Busing from Staging Area

Total Bus VMT/Const Period:	0	Bus Round Trips/Day:	0	max
Avg Bus VMT/Const Day:	0	Bus Occupancy/Trip:	0	
Max Bus VMT/Const Day:	0			
Distance to site from Bus staging area:	0	miles (roundtrip)		

Ref: Riverside County, Emfac 2007, V2.3, Nov 2006
On Road Vehicles (1970-2014)
Bus Carriers

(AFC Traffic and Transportation Section)

Emissions Factors (lbs/VMT)

NOx	CO	VOC	SOx	PM10	CO2
0.019574	0.033191	0.003404	0.000426	0.000426	3.4043

Round trip distance: 75 miles from the Blythe urban area.

Daily Emissions (lbs)

	NOx	**CO**	**VOC**	**SOx**	**PM10**	**CO2**	**PM2.5**
Avg	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Tons per Const Period

Avg	0.000	0.000	0.000	0.000	0.000	0.000	0.000

CO2e Emissions Estimates

	Total All Construction Phases	
For CO2 Estimated Emissions Only	1551	
Total CO2 emisisons from diesel combustion:	34629.9	tons/period
Total CO2 emissions from gasoline combustion:	15037	tons/period
Approximate methane fraction of CO2 for diesel combustion:		0.000051
Approximate N2O fraction of CO2 for diesel combustion:		0.000032
Approximate methane fraction of CO2 for gasoline combustion:		0.000213
Approximate N2O fraction of CO2 for gasoline combustion:		0.000113
Estimated methane from diesel combustion:	1.7661249	tons/period
Estimated N2O from diesel combustion:	1.1081568	tons/period
Estimated methane from gasoline combustion:	3.202881	tons/period
Estimated N2O from diesel combustion:	1.699181	tons/period
Estimated methane CO2e from diesel combustion:	37.088623	tons/period
Estimated N2O CO2e from diesel combustion:	343.52861	tons/period
Estimated methane CO2e from gasoline combustion:	67.260501	tons/period
Estimated N2O CO2e from gasoline combustion:	526.74611	tons/period

Partial CO2e emissions from construction: 50642 tons/period

For GHG Where All Species are Estimated

CO2	0	tons/period
CH4	3	tons/period
N2O	0	tons/period

Adjusted GWP Rates

CO2	0	tons/period
CH4	63	tons/period
N2O	0	tons/period
CO2e	63	tons/period

Total CO2e emissions from construction: 50705 tons/period

46095 metric tons/period

CCAR General Protocol, January 2009, Version 3.1.
IPCC SAR values for methane and N2O.

Average Vehicle Weight Estimate for Construction Period

Vehicle Type	Weight tons	# Vehicles per day	Frac. of total vehicles	
Passenger LDP/LDT	2.5	606	0.953	Worker and support travel vehicles
HDD Loaded	35	13	0.020	
HDD Unloaded	15	13	0.020	Materials delivery trucks, service
MDGT Loaded	15	2	0.003	trucks, fuel trucks, other misc trucks.
MDGT Unloaded	5	2	0.003	
		636	1.000	
Vehicle Total		621		

Weighted Avg Vehicle Weight, tons : 3.5

Ref: AP-42, Section 13.2.2, 11/06, mean vehicle weight guidance, p.13.2.2-6.

Delivery Vehicles Only			
HDD Loaded	35	13	0.433
HDD Unloaded	15	13	0.433
MDGT Loaded	15	2	0.067
MDGT Unloaded	5	2	0.067
		30	1

Weighted Avg Vehicle Weight, tons : 23

Fleet Average Emission Factors (Diesel)

2013

Air Basin	SC

		(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	LBS/HP-HR						
Equipment	MaxHP	ROG	CO	NOX	SOX	PM	CO2	CH4	ROG	CO	NOX	SOX	PM	CO2	CH4
Aerial Lifts	15	0.0101	0.0528	0.0637	0.0001	0.0027	8.7	0.0009	0.0007	0.0035	0.0042	0.000009	0.0002	0.5768	0.000061
	25	0.0166	0.0503	0.0937	0.0001	0.0051	11.0	0.0015	0.0007	0.0020	0.0037	0.000006	0.0002	0.4384	0.000060
	50	0.0592	0.1757	0.1840	0.0003	0.0156	19.6	0.0053	0.0012	0.0035	0.0037	0.000005	0.0003	0.3923	0.000107
	120	0.0558	0.2425	0.3758	0.0004	0.0299	38.1	0.0050	0.0005	0.0020	0.0031	0.000004	0.0002	0.3173	0.000042
	500	0.1191	0.4671	1.5310	0.0021	0.0448	213	0.0107	0.0002	0.0009	0.0031	0.000004	0.0001	0.4257	0.000021
	750	0.2221	0.8443	2.8534	0.0039	0.0825	385	0.0200	0.0003	0.0011	0.0038	0.000005	0.0001	0.5130	0.000027
Aerial Lifts Total		0.0529	0.1925	0.3059	0.0004	0.0202	34.7	0.0048							
Air Compressors	15	0.0122	0.0484	0.0732	0.0001	0.0048	7.2	0.0011	0.0008	0.0032	0.0049	0.000007	0.0003	0.4815	0.000073
	25	0.0266	0.0744	0.1306	0.0002	0.0081	14.4	0.0024	0.0011	0.0030	0.0052	0.000007	0.0003	0.5778	0.000096
	50	0.0921	0.2546	0.2221	0.0003	0.0220	22.3	0.0083	0.0018	0.0051	0.0044	0.000006	0.0004	0.4454	0.000166
	120	0.0825	0.3251	0.4991	0.0006	0.0456	47.0	0.0074	0.0007	0.0027	0.0042	0.000005	0.0004	0.3913	0.000062
	175	0.1059	0.5054	0.8385	0.0010	0.0472	88.5	0.0096	0.0006	0.0029	0.0048	0.000006	0.0003	0.5056	0.000055
	250	0.1007	0.2955	1.1320	0.0015	0.0347	131	0.0091	0.0004	0.0012	0.0045	0.000006	0.0001	0.5249	0.000036
	500	0.1626	0.5399	1.7639	0.0023	0.0570	232	0.0147	0.0003	0.0011	0.0035	0.000005	0.0001	0.4635	0.000029
	750	0.2547	0.8344	2.8139	0.0036	0.0898	358	0.0230	0.0003	0.0011	0.0038	0.000005	0.0001	0.4775	0.000031
	1000	0.4190	1.4213	5.0841	0.0049	0.1474	486	0.0378	0.0004	0.0014	0.0051	0.000005	0.0001	0.4864	0.000038
Air Compressors Total		0.0913	0.3376	0.6065	0.0007	0.0434	63.6	0.0082							
Bore/Drill Rigs	15	0.0120	0.0632	0.0754	0.0002	0.0029	10.3	0.0011	0.0008	0.0042	0.0050	0.000011	0.0002	0.6897	0.000072
	25	0.0193	0.0658	0.1226	0.0002	0.0049	16.0	0.0017	0.0008	0.0026	0.0049	0.000008	0.0002	0.6395	0.000070
	50	0.0289	0.2282	0.2568	0.0004	0.0120	31.0	0.0026	0.0006	0.0046	0.0051	0.000008	0.0002	0.6207	0.000052
	120	0.0447	0.4698	0.4583	0.0009	0.0257	77.1	0.0040	0.0004	0.0039	0.0038	0.000008	0.0002	0.6427	0.000034
	175	0.0704	0.7538	0.6931	0.0016	0.0302	141	0.0063	0.0004	0.0043	0.0040	0.000009	0.0002	0.8062	0.000036
	250	0.0795	0.3429	0.7632	0.0021	0.0221	188	0.0072	0.0003	0.0014	0.0031	0.000008	0.0001	0.7524	0.000029
	500	0.1295	0.5517	1.1717	0.0031	0.0361	311	0.0117	0.0003	0.0011	0.0023	0.000006	0.0001	0.6226	0.000023
	750	0.2565	1.0899	2.3376	0.0062	0.0715	615	0.0231	0.0003	0.0015	0.0031	0.000008	0.0001	0.8201	0.000031
	1000	0.4163	1.6675	5.9553	0.0093	0.1544	928	0.0376	0.0004	0.0017	0.0060	0.000009	0.0002	0.9283	0.000038
Bore/Drill Rigs Total		0.0786	0.5044	0.8125	0.0017	0.0302	165	0.0071							
Cement and Mortar	15	0.0074	0.0386	0.0470	0.0001	0.0021	6.3	0.0007	0.0005	0.0026	0.0031	0.000007	0.0001	0.4213	0.000045
	25	0.0270	0.0813	0.1510	0.0002	0.0083	17.6	0.0024	0.0011	0.0033	0.0060	0.000009	0.0003	0.7022	0.000098
Cement and Mortar Mixers Total		0.0091	0.0421	0.0556	0.0001	0.0026	7.2	0.0008							
Concrete/Industrial	25	0.0199	0.0678	0.1257	0.0002	0.0049	16.5	0.0018	0.0008	0.0027	0.0050	0.000008	0.0002	0.6591	0.000072
	50	0.0955	0.2918	0.2858	0.0004	0.0247	30.2	0.0086	0.0019	0.0058	0.0057	0.000008	0.0005	0.6042	0.000172
	120	0.1065	0.4836	0.7154	0.0009	0.0589	74.1	0.0096	0.0009	0.0040	0.0060	0.000007	0.0005	0.6179	0.000080
	175	0.1569	0.8701	1.3612	0.0018	0.0706	160	0.0142	0.0009	0.0050	0.0078	0.000010	0.0004	0.9154	0.000081
Concrete/Industrial Saws Total		0.1002	0.4088	0.5572	0.0007	0.0452	58.5	0.0090							
Cranes	50	0.1015	0.2892	0.2394	0.0003	0.0239	23.2	0.0092	0.0020	0.0058	0.0048	0.000006	0.0005	0.4637	0.000183
	120	0.0919	0.3618	0.5508	0.0006	0.0493	50.1	0.0083	0.0008	0.0030	0.0046	0.000005	0.0004	0.4179	0.000069
	175	0.1031	0.4821	0.7769	0.0009	0.0445	80.3	0.0093	0.0006	0.0028	0.0044	0.000005	0.0003	0.4591	0.000053
	250	0.1040	0.2948	0.9948	0.0013	0.0351	112	0.0094	0.0004	0.0012	0.0040	0.000005	0.0001	0.4486	0.000038
	500	0.1551	0.5292	1.4230	0.0018	0.0518	180	0.0140	0.0003	0.0011	0.0028	0.000004	0.0001	0.3602	0.000028
	750	0.2625	0.8887	2.4614	0.0030	0.0885	303	0.0237	0.0003	0.0012	0.0033	0.000004	0.0001	0.4041	0.000032
	9999	0.9491	3.3249	10.3665	0.0098	0.3189	971	0.0856							
Cranes Total		0.1348	0.4737	1.1934	0.0014	0.0508	129	0.0122							

Crawler Tractors	50	0.1176	0.3246	0.2627	0.0003	0.0270	24.9	0.0106	0.0024	0.0065	0.0053	0.000006	0.0005	0.4976	0.000212
	120	0.1293	0.4858	0.7686	0.0008	0.0677	65.8	0.0117	0.0011	0.0040	0.0064	0.000006	0.0006	0.5484	0.000097
	175	0.1674	0.7448	1.2529	0.0014	0.0713	121	0.0151	0.0010	0.0043	0.0072	0.000008	0.0004	0.6925	0.000086
	250	0.1764	0.5000	1.5945	0.0019	0.0613	166	0.0159	0.0007	0.0020	0.0064	0.000007	0.0002	0.6645	0.000064
	500	0.2542	0.9504	2.2389	0.0025	0.0868	259	0.0229	0.0005	0.0019	0.0045	0.000005	0.0002	0.5185	0.000046
	750	0.4574	1.6983	4.1042	0.0047	0.1573	465	0.0413	0.0006	0.0023	0.0055	0.000006	0.0002	0.6196	0.000055
	1000	0.6901	2.6950	7.3731	0.0066	0.2361	658	0.0623	0.0007	0.0027	0.0074	0.000007	0.0002	0.6581	0.000062
Crawler Tractors Total		0.1584	0.5900	1.1593	0.0013	0.0697	114	0.0143							
Crushing/Proc. Equ	50	0.1741	0.5009	0.4359	0.0006	0.0422	44.0	0.0157	0.0035	0.0100	0.0087	0.000011	0.0008	0.8803	0.000314
	120	0.1402	0.5764	0.8552	0.0010	0.0779	83.1	0.0127	0.0012	0.0048	0.0071	0.000008	0.0006	0.6928	0.000105
	175	0.1942	0.9615	1.5237	0.0019	0.0864	167	0.0175	0.0011	0.0055	0.0087	0.000011	0.0005	0.9558	0.000100
	250	0.1848	0.5425	2.0202	0.0028	0.0620	245	0.0167	0.0007	0.0022	0.0081	0.000011	0.0002	0.9781	0.000067
	500	0.2608	0.8480	2.7097	0.0037	0.0884	374	0.0235	0.0005	0.0017	0.0054	0.000007	0.0002	0.7473	0.000047
	750	0.4147	1.3191	4.4498	0.0059	0.1418	589	0.0374	0.0006	0.0018	0.0059	0.000008	0.0002	0.7851	0.000050
	9999	1.1270	3.6752	13.3218	0.0131	0.3880	1,308	0.1017							
Crushing/Proc. Equipment Total		0.1733	0.6773	1.1752	0.0015	0.0748	132	0.0156							
Dumpers/Tenders	25	0.0097	0.0320	0.0601	0.0001	0.0029	7.6	0.0009	0.0004	0.0013	0.0024	0.000004	0.0001	0.3050	0.000035
Dumpers/Tenders Total		0.0097	0.0320	0.0601	0.0001	0.0029	7.6	0.0009							
Excavators	25	0.0198	0.0677	0.1253	0.0002	0.0047	16.4	0.0018	0.0008	0.0027	0.0050	0.000008	0.0002	0.6576	0.000072
	50	0.0816	0.2841	0.2458	0.0003	0.0212	25.0	0.0074	0.0016	0.0057	0.0049	0.000006	0.0004	0.5004	0.000147
	120	0.1086	0.5177	0.6791	0.0009	0.0586	73.6	0.0098	0.0009	0.0043	0.0057	0.000007	0.0005	0.6135	0.000082
	175	0.1208	0.6668	0.8932	0.0013	0.0512	112	0.0109	0.0007	0.0038	0.0051	0.000007	0.0003	0.6413	0.000062
	250	0.1242	0.3541	1.1360	0.0018	0.0372	159	0.0112	0.0005	0.0014	0.0045	0.000007	0.0001	0.6347	0.000045
	500	0.1735	0.5271	1.4763	0.0023	0.0516	234	0.0157	0.0003	0.0011	0.0030	0.000005	0.0001	0.4675	0.000031
	750	0.2895	0.8731	2.5290	0.0039	0.0871	387	0.0261	0.0004	0.0012	0.0034	0.000005	0.0001	0.5166	0.000035
Excavators Total		0.1220	0.5338	0.9071	0.0013	0.0481	120	0.0110							
Forklifts	50	0.0445	0.1623	0.1431	0.0002	0.0121	14.7	0.0040	0.0009	0.0032	0.0029	0.000004	0.0002	0.2934	0.000080
	120	0.0438	0.2176	0.2788	0.0004	0.0241	31.2	0.0040	0.0004	0.0018	0.0023	0.000003	0.0002	0.2602	0.000033
	175	0.0572	0.3307	0.4261	0.0006	0.0246	56.1	0.0052	0.0003	0.0019	0.0024	0.000004	0.0001	0.3203	0.000030
	250	0.0570	0.1614	0.5281	0.0009	0.0168	77.1	0.0051	0.0002	0.0006	0.0021	0.000003	0.0001	0.3085	0.000021
	500	0.0781	0.2208	0.6592	0.0011	0.0228	111	0.0070	0.0002	0.0004	0.0013	0.000002	0.0000	0.2220	0.000014
Forklifts Total		0.0541	0.2235	0.3950	0.0006	0.0204	54.4	0.0049							
Generator Sets	15	0.0149	0.0684	0.1016	0.0002	0.0058	10.2	0.0013	0.0010	0.0046	0.0068	0.000011	0.0004	0.6805	0.000090
	25	0.0266	0.0908	0.1594	0.0002	0.0091	17.6	0.0024	0.0011	0.0036	0.0064	0.000009	0.0004	0.7053	0.000096
	50	0.0872	0.2639	0.2847	0.0004	0.0234	30.6	0.0079	0.0017	0.0053	0.0057	0.000008	0.0005	0.6125	0.000157
	120	0.1106	0.4905	0.7587	0.0009	0.0590	77.9	0.0100	0.0009	0.0041	0.0063	0.000008	0.0005	0.6496	0.000083
	175	0.1347	0.7388	1.2314	0.0016	0.0592	142	0.0122	0.0008	0.0042	0.0070	0.000009	0.0003	0.8113	0.000069
	250	0.1277	0.4365	1.6763	0.0024	0.0464	213	0.0115	0.0005	0.0017	0.0067	0.000010	0.0002	0.8500	0.000046
	500	0.1818	0.7230	2.3955	0.0033	0.0690	337	0.0164	0.0004	0.0014	0.0048	0.000007	0.0001	0.6737	0.000033
	750	0.3035	1.1671	3.9863	0.0055	0.1134	544	0.0274	0.0004	0.0016	0.0053	0.000007	0.0002	0.7251	0.000037
Generator Sets Total		0.0767	0.3045	0.5430	0.0007	0.0324	61.0	0.0069							
Graders	50	0.1080	0.3263	0.2772	0.0004	0.0262	27.5	0.0097	0.0022	0.0065	0.0055	0.000007	0.0005	0.5508	0.000195
	120	0.1254	0.5310	0.7729	0.0009	0.0676	75.0	0.0113	0.0010	0.0044	0.0064	0.000007	0.0006	0.6247	0.000094
	175	0.1467	0.7345	1.1193	0.0014	0.0631	124	0.0132	0.0008	0.0042	0.0064	0.000008	0.0004	0.7081	0.000076
	250	0.1492	0.4331	1.4184	0.0019	0.0494	172	0.0135	0.0006	0.0017	0.0057	0.000008	0.0002	0.6885	0.000054
	500	0.1855	0.6289	1.6842	0.0023	0.0608	229	0.0167	0.0004	0.0013	0.0034	0.000005	0.0001	0.4590	0.000033
	750	0.3952	1.3289	3.6674	0.0049	0.1306	486	0.0357	0.0005	0.0018	0.0049	0.000007	0.0002	0.6477	0.000048
Graders Total		0.1446	0.6053	1.1663	0.0015	0.0593	133	0.0130							

Off-Highway Tractc	120	0.2113	0.7191	1.2368	0.0011	0.1078	93.7	0.0191	0.0018	0.0060	0.0103	0.000009	0.0009	0.7811	0.000159
	175	0.2045	0.8335	1.5337	0.0015	0.0871	130	0.0185	0.0012	0.0048	0.0088	0.000008	0.0005	0.7452	0.000105
	250	0.1641	0.4691	1.4453	0.0015	0.0601	130	0.0148	0.0007	0.0019	0.0058	0.000006	0.0002	0.5217	0.000059
	750	0.6538	2.8815	5.8130	0.0057	0.2353	568	0.0590	0.0009	0.0038	0.0078	0.000008	0.0003	0.7575	0.000079
	1000	0.9818	4.4978	10.0554	0.0082	0.3436	814	0.0886	0.0010	0.0045	0.0101	0.000008	0.0003	0.8143	0.000089
Off-Highway Tractors Total		0.2077	0.7649	1.7062	0.0017	0.0818	151	0.0187							
Off-Highway Trucks	175	0.1441	0.7580	1.0305	0.0014	0.0602	125	0.0130	0.0008	0.0043	0.0059	0.000008	0.0003	0.7148	0.000074
	250	0.1400	0.3837	1.2373	0.0019	0.0412	167	0.0126	0.0006	0.0015	0.0049	0.000007	0.0002	0.6662	0.000051
	500	0.2170	0.6362	1.7865	0.0027	0.0634	272	0.0196	0.0004	0.0013	0.0036	0.000005	0.0001	0.5447	0.000039
	750	0.3542	1.0311	2.9938	0.0044	0.1046	442	0.0320	0.0005	0.0014	0.0040	0.000006	0.0001	0.5890	0.000043
	1000	0.5484	1.6691	5.9808	0.0063	0.1796	625	0.0495	0.0005	0.0017	0.0060	0.000006	0.0002	0.6247	0.000049
Off-Highway Trucks Total		0.2141	0.6361	1.8543	0.0027	0.0644	260	0.0193							
Other Construction	15	0.0118	0.0617	0.0737	0.0002	0.0029	10.1	0.0011	0.0008	0.0041	0.0049	0.000010	0.0002	0.6738	0.000071
	25	0.0160	0.0544	0.1013	0.0002	0.0041	13.2	0.0014	0.0006	0.0022	0.0041	0.000007	0.0002	0.5287	0.000058
	50	0.0753	0.2653	0.2585	0.0004	0.0205	28.0	0.0068	0.0015	0.0053	0.0052	0.000007	0.0004	0.5598	0.000136
	120	0.1006	0.5277	0.7025	0.0009	0.0567	80.9	0.0091	0.0008	0.0044	0.0059	0.000008	0.0005	0.6738	0.000076
	175	0.0935	0.5873	0.8011	0.0012	0.0420	107	0.0084	0.0005	0.0034	0.0046	0.000007	0.0002	0.6087	0.000048
	500	0.1452	0.5234	1.5187	0.0025	0.0491	254	0.0131	0.0003	0.0010	0.0030	0.000005	0.0001	0.5085	0.000026
Other Construction Equipment To		0.0872	0.3765	0.7938	0.0013	0.0330	123	0.0079							
Other General Indu	15	0.0066	0.0391	0.0466	0.0001	0.0018	6.4	0.0006	0.0004	0.0026	0.0031	0.000007	0.0001	0.4264	0.000040
	25	0.0185	0.0632	0.1170	0.0002	0.0044	15.3	0.0017	0.0007	0.0025	0.0047	0.000008	0.0002	0.6140	0.000067
	50	0.0980	0.2738	0.2243	0.0003	0.0232	21.7	0.0088	0.0020	0.0055	0.0045	0.000006	0.0005	0.4349	0.000177
	120	0.1177	0.4487	0.6789	0.0007	0.0644	62.0	0.0106	0.0010	0.0037	0.0057	0.000006	0.0005	0.5170	0.000089
	175	0.1261	0.5728	0.9333	0.0011	0.0549	95.9	0.0114	0.0007	0.0033	0.0053	0.000006	0.0003	0.5482	0.000065
	250	0.1174	0.3177	1.2013	0.0015	0.0380	136	0.0106	0.0005	0.0013	0.0048	0.000006	0.0002	0.5423	0.000042
	500	0.2135	0.6384	2.0642	0.0026	0.0693	265	0.0193	0.0004	0.0013	0.0041	0.000005	0.0001	0.5308	0.000039
	750	0.3546	1.0522	3.5146	0.0044	0.1165	437	0.0320	0.0005	0.0014	0.0047	0.000006	0.0002	0.5833	0.000043
	1000	0.5246	1.6793	6.0067	0.0056	0.1805	560	0.0473	0.0005	0.0017	0.0060	0.000006	0.0002	0.5596	0.000047
Other General Industrial Equipme		0.1542	0.5159	1.3484	0.0016	0.0580	152	0.0139							
Other Material Han	50	0.1361	0.3789	0.3119	0.0004	0.0323	30.3	0.0123	0.0027	0.0076	0.0062	0.000008	0.0006	0.6067	0.000246
	120	0.1144	0.4370	0.6628	0.0007	0.0628	60.7	0.0103	0.0010	0.0036	0.0055	0.000006	0.0005	0.5056	0.000086
	175	0.1591	0.7257	1.1860	0.0014	0.0696	122	0.0144	0.0009	0.0041	0.0068	0.000008	0.0004	0.6976	0.000082
	250	0.1241	0.3385	1.2829	0.0016	0.0405	145	0.0112	0.0005	0.0014	0.0051	0.000007	0.0002	0.5801	0.000045
	500	0.1521	0.4596	1.4883	0.0019	0.0498	192	0.0137	0.0003	0.0009	0.0030	0.000004	0.0001	0.3833	0.000027
Other Material Handling Equipmer		0.1473	0.4951	1.3132	0.0015	0.0562	141	0.0133							
Pavers	25	0.0247	0.0799	0.1500	0.0002	0.0075	18.7	0.0022	0.0010	0.0032	0.0060	0.000009	0.0003	0.7464	0.000089
	50	0.1366	0.3592	0.2948	0.0004	0.0308	28.0	0.0123	0.0027	0.0072	0.0059	0.000007	0.0006	0.5598	0.000246
	120	0.1387	0.5057	0.8357	0.0008	0.0729	69.2	0.0125	0.0012	0.0042	0.0070	0.000007	0.0006	0.5766	0.000104
	175	0.1777	0.7784	1.3769	0.0014	0.0769	128	0.0160	0.0010	0.0044	0.0079	0.000008	0.0004	0.7331	0.000092
	250	0.2072	0.6081	1.9469	0.0022	0.0756	194	0.0187	0.0008	0.0024	0.0078	0.000009	0.0003	0.7775	0.000075
	500	0.2275	0.9254	2.1080	0.0023	0.0818	233	0.0205	0.0005	0.0019	0.0042	0.000005	0.0002	0.4665	0.000041
Pavers Total		0.1511	0.5357	0.8542	0.0009	0.0603	77.9	0.0136							
Paving Equipment	25	0.0153	0.0520	0.0968	0.0002	0.0039	12.6	0.0014	0.0006	0.0021	0.0039	0.000006	0.0002	0.5051	0.000055
	50	0.1166	0.3049	0.2514	0.0003	0.0263	23.9	0.0105	0.0023	0.0061	0.0050	0.000006	0.0005	0.4785	0.000210
	120	0.1087	0.3958	0.6561	0.0006	0.0574	54.5	0.0098	0.0009	0.0033	0.0055	0.000005	0.0005	0.4542	0.000082
	175	0.1387	0.6079	1.0816	0.0011	0.0602	101	0.0125	0.0008	0.0035	0.0062	0.000006	0.0003	0.5773	0.000072
	250	0.1277	0.3763	1.2206	0.0014	0.0467	122	0.0115	0.0005	0.0015	0.0049	0.000006	0.0002	0.4892	0.000046
Paving Equipment Total		0.1142	0.4316	0.7709	0.0008	0.0536	68.9	0.0103							
Plate Compactors	15	0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005	0.0003	0.0018	0.0021	0.000004	0.0001	0.2876	0.000030
Plate Compactors Total		0.0050	0.0263	0.0314	0.0001	0.0012	4.3	0.0005							

Pressure Washers	15	0.0071	0.0328	0.0487	0.0001	0.0028	4.9	0.0006	0.0005	0.0022	0.0032	0.000005	0.0002	0.3260	0.000043
	25	0.0108	0.0368	0.0646	0.0001	0.0037	7.1	0.0010	0.0004	0.0015	0.0026	0.000004	0.0001	0.2859	0.000039
	50	0.0315	0.1037	0.1284	0.0002	0.0094	14.3	0.0028	0.0006	0.0021	0.0026	0.000004	0.0002	0.2859	0.000057
	120	0.0302	0.1443	0.2235	0.0003	0.0157	24.1	0.0027	0.0003	0.0012	0.0019	0.000002	0.0001	0.2006	0.000023
Pressure Washers Total		0.0159	0.0619	0.0878	0.0001	0.0058	9.4	0.0014							
Pumps	15	0.0125	0.0497	0.0752	0.0001	0.0049	7.4	0.0011	0.0008	0.0033	0.0050	0.000008	0.0003	0.4949	0.000075
	25	0.0359	0.1004	0.1761	0.0002	0.0109	19.5	0.0032	0.0014	0.0040	0.0070	0.000010	0.0004	0.7795	0.000129
	50	0.1052	0.3116	0.3228	0.0004	0.0275	34.3	0.0095	0.0021	0.0062	0.0065	0.000009	0.0005	0.6867	0.000190
	120	0.1149	0.4984	0.7706	0.0009	0.0617	77.9	0.0104	0.0010	0.0042	0.0064	0.000008	0.0005	0.6496	0.000086
	175	0.1385	0.7405	1.2344	0.0016	0.0611	140	0.0125	0.0008	0.0042	0.0071	0.000009	0.0003	0.8007	0.000071
	250	0.1266	0.4210	1.6140	0.0023	0.0457	201	0.0114	0.0005	0.0017	0.0065	0.000009	0.0002	0.8055	0.000046
	500	0.1952	0.7595	2.4849	0.0034	0.0734	345	0.0176	0.0004	0.0015	0.0050	0.000007	0.0001	0.6904	0.000035
	750	0.3326	1.2556	4.2353	0.0057	0.1235	571	0.0300	0.0004	0.0017	0.0056	0.000008	0.0002	0.7609	0.000040
Pumps Total		0.0748	0.2926	0.4705	0.0006	0.0323	49.6	0.0067							
Rollers	15	0.0074	0.0386	0.0461	0.0001	0.0018	6.3	0.0007	0.0005	0.0026	0.0031	0.000007	0.0001	0.4213	0.000044
	25	0.0161	0.0549	0.1023	0.0002	0.0041	13.3	0.0015	0.0006	0.0022	0.0041	0.000007	0.0002	0.5337	0.000058
	50	0.1025	0.2911	0.2583	0.0003	0.0245	26.0	0.0092	0.0020	0.0058	0.0052	0.000007	0.0005	0.5197	0.000185
	120	0.0986	0.4063	0.6253	0.0007	0.0534	59.0	0.0089	0.0008	0.0034	0.0052	0.000006	0.0004	0.4916	0.000074
	175	0.1247	0.6199	1.0114	0.0012	0.0550	108	0.0113	0.0007	0.0035	0.0058	0.000007	0.0003	0.6180	0.000064
	250	0.1262	0.3887	1.3124	0.0017	0.0451	153	0.0114	0.0005	0.0016	0.0052	0.000007	0.0002	0.6124	0.000046
	500	0.1654	0.6313	1.6820	0.0022	0.0593	219	0.0149	0.0003	0.0013	0.0034	0.000004	0.0001	0.4382	0.000030
Rollers Total		0.0973	0.4060	0.6546	0.0008	0.0453	67.1	0.0088							
Rough Terrain Fork	50	0.1181	0.3778	0.3316	0.0004	0.0300	33.9	0.0107	0.0024	0.0076	0.0066	0.000009	0.0006	0.6772	0.000213
	120	0.0955	0.4327	0.5995	0.0007	0.0529	62.4	0.0086	0.0008	0.0036	0.0050	0.000006	0.0004	0.5204	0.000072
	175	0.1352	0.7256	1.0448	0.0014	0.0592	125	0.0122	0.0008	0.0041	0.0060	0.000008	0.0003	0.7137	0.000070
	250	0.1294	0.3798	1.2955	0.0019	0.0416	171	0.0117	0.0005	0.0015	0.0052	0.000008	0.0002	0.6832	0.000047
	500	0.1824	0.5717	1.7096	0.0025	0.0584	257	0.0165	0.0004	0.0011	0.0034	0.000005	0.0001	0.5131	0.000033
Rough Terrain Forklifts Total		0.1009	0.4642	0.6526	0.0008	0.0532	70.3	0.0091							
Rubber Tired Doze	175	0.2119	0.8457	1.5561	0.0015	0.0893	129	0.0191	0.0012	0.0048	0.0089	0.000008	0.0005	0.7399	0.000109
	250	0.2435	0.6833	2.0817	0.0021	0.0881	183	0.0220	0.0010	0.0027	0.0083	0.000008	0.0004	0.7339	0.000088
	500	0.3211	1.4228	2.7305	0.0026	0.1133	265	0.0290	0.0006	0.0028	0.0055	0.000005	0.0002	0.5297	0.000058
	750	0.4843	2.1329	4.1797	0.0040	0.1716	399	0.0437	0.0006	0.0028	0.0056	0.000005	0.0002	0.5317	0.000058
	1000	0.7496	3.4322	7.4509	0.0060	0.2591	592	0.0676	0.0007	0.0034	0.0075	0.000006	0.0003	0.5919	0.000068
Rubber Tired Dozers Total		0.2986	1.1749	2.5452	0.0025	0.1064	239	0.0269							
Rubber Tired Load	25	0.0204	0.0697	0.1292	0.0002	0.0050	16.9	0.0018	0.0008	0.0028	0.0052	0.000009	0.0002	0.6772	0.000074
	50	0.1200	0.3641	0.3118	0.0004	0.0292	31.1	0.0108	0.0024	0.0073	0.0062	0.000008	0.0006	0.6230	0.000216
	120	0.0971	0.4152	0.6015	0.0007	0.0525	58.9	0.0088	0.0008	0.0035	0.0050	0.000006	0.0004	0.4909	0.000073
	175	0.1238	0.6274	0.9501	0.0012	0.0535	106	0.0112	0.0007	0.0036	0.0054	0.000007	0.0003	0.6075	0.000064
	250	0.1259	0.3685	1.2125	0.0017	0.0417	149	0.0114	0.0005	0.0015	0.0048	0.000007	0.0002	0.5959	0.000045
	500	0.1867	0.6397	1.7158	0.0023	0.0613	237	0.0168	0.0004	0.0013	0.0034	0.000005	0.0001	0.4740	0.000034
	750	0.3850	1.3084	3.6184	0.0049	0.1276	486	0.0347	0.0005	0.0017	0.0048	0.000007	0.0002	0.6474	0.000046
	1000	0.5190	1.8389	5.9660	0.0060	0.1795	594	0.0468	0.0005	0.0018	0.0060	0.000006	0.0002	0.5939	0.000047
Rubber Tired Loaders Total		0.1195	0.4763	0.9346	0.0012	0.0508	109	0.0108							
Scrapers	120	0.1877	0.6943	1.1141	0.0011	0.0983	93.9	0.0169	0.0016	0.0058	0.0093	0.000009	0.0008	0.7825	0.000141
	175	0.2070	0.9107	1.5564	0.0017	0.0884	148	0.0187	0.0012	0.0052	0.0089	0.000010	0.0005	0.8461	0.000107
	250	0.2252	0.6408	2.0481	0.0024	0.0791	209	0.0203	0.0009	0.0026	0.0082	0.000009	0.0003	0.8379	0.000081
	500	0.3186	1.2113	2.8288	0.0032	0.1099	321	0.0287	0.0006	0.0024	0.0057	0.000006	0.0002	0.6429	0.000057
	750	0.5525	2.0861	4.9949	0.0056	0.1918	555	0.0499	0.0007	0.0028	0.0067	0.000007	0.0003	0.7404	0.000066
Scrapers Total		0.2783	1.0395	2.4118	0.0027	0.1005	262	0.0251							

Signal Boards	15	0.0072	0.0377	0.0450	0.0001	0.0018	6.2	0.0006	0.0005	0.0025	0.0030	0.000006	0.0001	0.4113	0.000043
	50	0.1151	0.3456	0.3415	0.0005	0.0296	36.2	0.0104	0.0023	0.0069	0.0068	0.000009	0.0006	0.7238	0.000208
	120	0.1176	0.5214	0.7807	0.0009	0.0644	80.2	0.0106	0.0010	0.0043	0.0065	0.000008	0.0005	0.6684	0.000088
	175	0.1535	0.8341	1.3333	0.0017	0.0685	155	0.0139	0.0009	0.0048	0.0076	0.000010	0.0004	0.8831	0.000079
	250	0.1632	0.5350	1.9963	0.0029	0.0580	255	0.0147	0.0007	0.0021	0.0080	0.000011	0.0002	1.0212	0.000059
Signal Boards Total		0.0192	0.0934	0.1399	0.0002	0.0077	16.7	0.0017							
Skid Steer Loaders	25	0.0202	0.0620	0.1166	0.0002	0.0063	13.8	0.0018	0.0008	0.0025	0.0047	0.000007	0.0003	0.5518	0.000073
	50	0.0517	0.2263	0.2279	0.0003	0.0157	25.5	0.0047	0.0010	0.0045	0.0046	0.000007	0.0003	0.5104	0.000093
	120	0.0429	0.2748	0.3267	0.0005	0.0245	42.8	0.0039	0.0004	0.0023	0.0027	0.000004	0.0002	0.3563	0.000032
Skid Steer Loaders Total		0.0468	0.2309	0.2522	0.0004	0.0179	30.3	0.0042							
Surfacing Equipme	50	0.0477	0.1403	0.1359	0.0002	0.0119	14.1	0.0043	0.0010	0.0028	0.0027	0.000004	0.0002	0.2822	0.000086
	120	0.0970	0.4215	0.6523	0.0007	0.0517	63.8	0.0088	0.0008	0.0035	0.0054	0.000006	0.0004	0.5314	0.000073
	175	0.0894	0.4730	0.7742	0.0010	0.0392	85.8	0.0081	0.0005	0.0027	0.0044	0.000006	0.0002	0.4901	0.000046
	250	0.1025	0.3374	1.1177	0.0015	0.0376	135	0.0092	0.0004	0.0013	0.0045	0.000006	0.0002	0.5395	0.000037
	500	0.1532	0.6418	1.6597	0.0022	0.0567	221	0.0138	0.0003	0.0013	0.0033	0.000004	0.0001	0.4424	0.000028
	750	0.2443	1.0046	2.6697	0.0035	0.0900	347	0.0220	0.0003	0.0013	0.0036	0.000005	0.0001	0.4627	0.000029
Surfacing Equipment Total		0.1277	0.5182	1.2760	0.0017	0.0468	166	0.0115							
Sweepers/Scrubbe	15	0.0124	0.0729	0.0870	0.0002	0.0034	11.9	0.0011	0.0008	0.0049	0.0058	0.000012	0.0002	0.7959	0.000074
	25	0.0237	0.0808	0.1496	0.0002	0.0058	19.6	0.0021	0.0009	0.0032	0.0060	0.000010	0.0002	0.7845	0.000085
	50	0.1048	0.3425	0.3055	0.0004	0.0271	31.6	0.0095	0.0021	0.0068	0.0061	0.000008	0.0005	0.6310	0.000189
	120	0.1107	0.5147	0.6989	0.0009	0.0622	75.0	0.0100	0.0009	0.0043	0.0058	0.000007	0.0005	0.6253	0.000083
	175	0.1439	0.7997	1.1204	0.0016	0.0637	139	0.0130	0.0008	0.0046	0.0064	0.000009	0.0004	0.7943	0.000074
	250	0.1146	0.3382	1.1784	0.0018	0.0362	162	0.0103	0.0005	0.0014	0.0047	0.000007	0.0001	0.6481	0.000041
Sweepers/Scrubbers Total		0.1148	0.5145	0.6862	0.0009	0.0510	78.5	0.0104							
Tractors/Loaders/B	25	0.0195	0.0657	0.1237	0.0002	0.0056	15.9	0.0018	0.0008	0.0026	0.0049	0.000008	0.0002	0.6345	0.000070
	50	0.0893	0.3199	0.2893	0.0004	0.0238	30.3	0.0081	0.0018	0.0064	0.0058	0.000008	0.0005	0.6069	0.000161
	120	0.0694	0.3529	0.4565	0.0006	0.0383	51.7	0.0063	0.0006	0.0029	0.0038	0.000005	0.0003	0.4311	0.000052
	175	0.0988	0.5861	0.7696	0.0011	0.0428	101	0.0089	0.0006	0.0033	0.0044	0.000007	0.0002	0.5794	0.000051
	250	0.1204	0.3666	1.1658	0.0019	0.0370	172	0.0109	0.0005	0.0015	0.0047	0.000008	0.0001	0.6869	0.000043
	500	0.2290	0.7443	2.0659	0.0039	0.0701	345	0.0207	0.0005	0.0015	0.0041	0.000008	0.0001	0.6897	0.000041
	750	0.3462	1.1159	3.2041	0.0058	0.1072	517	0.0312	0.0005	0.0015	0.0043	0.000008	0.0001	0.6897	0.000042
Tractors/Loaders/Backhoes Total		0.0792	0.3782	0.5392	0.0008	0.0387	66.8	0.0071							
Trenchers	15	0.0099	0.0517	0.0617	0.0001	0.0024	8.5	0.0009	0.0007	0.0034	0.0041	0.000009	0.0002	0.5643	0.000059
	25	0.0397	0.1355	0.2511	0.0004	0.0097	32.9	0.0036	0.0016	0.0054	0.0100	0.000017	0.0004	1.3167	0.000143
	50	0.1566	0.4082	0.3432	0.0004	0.0353	32.9	0.0141	0.0031	0.0082	0.0069	0.000009	0.0007	0.6584	0.000283
	120	0.1281	0.4684	0.7862	0.0008	0.0669	64.9	0.0116	0.0011	0.0039	0.0066	0.000006	0.0006	0.5408	0.000096
	175	0.1955	0.8632	1.5520	0.0016	0.0849	144	0.0176	0.0011	0.0049	0.0089	0.000009	0.0005	0.8223	0.000101
	250	0.2354	0.7089	2.2485	0.0025	0.0880	223	0.0212	0.0009	0.0028	0.0090	0.000010	0.0004	0.8916	0.000085
	500	0.2985	1.3011	2.8470	0.0031	0.1105	311	0.0269	0.0006	0.0026	0.0057	0.000006	0.0002	0.6226	0.000054
	750	0.5663	2.4440	5.4715	0.0059	0.2099	587	0.0511	0.0008	0.0033	0.0073	0.000008	0.0003	0.7825	0.000068
Trenchers Total		0.1427	0.4675	0.6684	0.0007	0.0549	58.7	0.0129							
Welders	15	0.0104	0.0416	0.0629	0.0001	0.0041	6.2	0.0009	0.0007	0.0028	0.0042	0.000006	0.0003	0.4138	0.000063
	25	0.0208	0.0581	0.1020	0.0001	0.0063	11.3	0.0019	0.0008	0.0023	0.0041	0.000006	0.0003	0.4514	0.000075
	50	0.0979	0.2753	0.2535	0.0003	0.0240	26.0	0.0088	0.0020	0.0055	0.0051	0.000007	0.0005	0.5192	0.000177
	120	0.0654	0.2659	0.4099	0.0005	0.0358	39.5	0.0059	0.0005	0.0022	0.0034	0.000004	0.0003	0.3292	0.000049
	175	0.1101	0.5455	0.9083	0.0011	0.0490	98.2	0.0099	0.0006	0.0031	0.0052	0.000006	0.0003	0.5611	0.000057
	250	0.0855	0.2618	1.0026	0.0013	0.0301	119	0.0077	0.0003	0.0010	0.0040	0.000005	0.0001	0.4763	0.000031
	500	0.1092	0.3838	1.2526	0.0016	0.0394	168	0.0098	0.0002	0.0008	0.0025	0.000003	0.0001	0.3352	0.000020
Welders Total		0.0646	0.2096	0.2564	0.0003	0.0225	25.6	0.0058							

All factors already account fot load and use rates per SCAQMD.

Average Emissions Factors, lb/hr:	0.1105	0.4296	0.8339	0.0010	0.0441	94.4934	0.0100
All Equip, HP Categories	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)	(lb/hr)
	ROG	CO	NOX	SOX	PM	CO2	CH4

Table 4.1E-6

Construction Schedule

Preliminary

CLIENT: BrightSource Industries Israel
PROJECT: Palen Solar Electric Generating System
DOCUMENT: 459892-PSEGS-DOC-004

BY: CH2M HILL
REV: 0
DATE: 21 DEC 2012

Year	2013			2014												2015												2016					
Month	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Activity / Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
PROJECT SITE & COMMON AREAS																																	
Biological Survey																																	
Site Fencing																																	
Site Roads																																	
Switchyard																																	
Grading																																	
Foundations																																	
Equipment Erection																																	
Commissioning																																	
Utilities																																	
Gas Pipeline																																	
230 kV Underground Lines																																	
Permanent Common Facilities																																	
Grading																																	
Evaporation Ponds																																	
Foundations																																	
Building Erection																																	
FIRST SOLAR FIELD																																	
Solar Field Roads																																	
Heliostat Installation																																	
SECOND SOLAR FIELD																																	
Solar Field Roads																																	
Heliostat Installation																																	
FIRST POWER BLOCK																																	
Grading																																	
Foundations and Underground Work																																	
Solar Tower																																	
Solar Receiver Steam Generator																																	
Steam Turbine																																	
Air Cooled Condenser																																	
Mechanical Erection																																	
Electrical Erection																																	
Checkout and Commissioning																																	
SECOND POWER BLOCK																																	
Grading																																	
Foundations and Underground Work																																	
Solar Tower																																	
Solar Receiver Steam Generator																																	
Steam Turbine																																	
Air Cooled Condenser																																	
Mechanical Erection																																	
Electrical Erection																																	
Checkout and Commissioning																																	

Table 4.1E-7 Construction Equipment Schedule

Document: 459892-PSEGS-DOC-005
Client: BrightSource Industries Israel
Project: Palen Solar Electric Generating Facility

Qty	Equipment	Fuel	HP	Usage Factor	Load Factor	Month: MM/YY Daily Operation	1 10/13	2 11/13	3 12/13	4 1/14	5 2/14	6 3/14	7 4/14	8 5/14	9 6/14	10 7/14	11 8/14	12 9/14	13 10/14
Solar Field Assembly and Installation (total for 2 plants)																			
2 ea	ISO Carrier	Diesel	290 hp	80%	57%	8 hrs/day						2	2	2	2	2	2	2	2
2 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	16 hrs/day						2	2	2	2	2	2	2	2
2 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	16 hrs/day						2	2	2	2	2	2	2	2
2 ea	Yard Tractors	Diesel	250 hp	80%	60%	16 hrs/day					2	2	2	2	2	2	2	2	2
6 ea	Grader (CAT 160M AWD)	Diesel	215 hp	80%	61%	8 hrs/day				2	4	6	6	6	6	6	6	6	6
16 ea	Farm Tractors	Diesel	75 hp	80%	55%	8 hrs/day					4	8	16	16	16	16	16	16	16
2 ea	35 ton Rough Terrain Crane	Diesel	160 hp	80%	43%	8 hrs/day					2	2	2	2	2	2	2	2	2
4 ea	Pylon Insertion Rigs	Diesel	670 hp	80%	62%	8 hrs/day					2	4	4	4	4	4	4	4	4
Site Road Work																			
2 ea	Grader (CAT 160M AWD)	Diesel	215 hp	80%	61%	8 hrs/day				2	2	2	2	2	2				
4 ea	Elevating Scraper (CAT)	Diesel	330 hp	80%	72%	8 hrs/day				4	4	4	4	2	2				
1 ea	Compactor (CAT CP74)	Diesel	160 hp	80%	50%	8 hrs/day				1	1	1	1	1					
1 ea	Paver	Diesel	220 hp	80%	62%	6 hrs/day								1	1				
Concrete Batch Plant																			
1 ea	Front End Loader (CAT 980K)	Diesel	369 hp	80%	55%	8 hrs/day				1	1	1	1	1	1	1	1	1	1
20 ea	Concrete Transit Mix Trucks	Diesel	400 hp	N/A	On Road	8 hrs/day				6	10	10	16	20	20	20	20	20	20
Tower and Boiler Erection (total for 2 plants)																			
2 ea	Strand Jack System	Diesel	670 hp	80%	62%	5 hrs/day									1	1	1	2	2
2 ea	888 Manitowoc Crawler Crane	Diesel	330 hp	80%	43%	8 hrs/day				1	1	1	2	2	2	2	2	1	1
2 ea	120 ton Rough Terrain Picker	Diesel	300 hp	80%	43%	8 hrs/day				1	1	1	2	2	2	2	2	2	1
4 ea	50 ton Rough Terrain Picker	Diesel	190 hp	80%	43%	8 hrs/day				1	2	2	3	4	4	4	4	3	3
2 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day				1	1	1	2	2	2	2	2	2	1
8 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day				2	4	4	6	8	8	8	8	4	2
8 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day				2	4	4	6	8	8	8	8	6	6
12 ea	125 ft Manlift	Diesel	75 hp	80%	46%	8 hrs/day				4	6	6	10	12	12	12	12	10	8
4 ea	Semi Tractor	Diesel	250 hp	N/A	On Road	8 hrs/day				2	2	2	4	4	4	4	4	4	2
ACC Erection (total for 2 plants)																			
2 ea	888 Manitowoc Crawler Crane	Diesel	330 hp	80%	43%	8 hrs/day												1	1
4 ea	50 ton Rough Terrain Picker	Diesel	190 hp	80%	43%	8 hrs/day												1	2
2 ea	50,000 lb Forklift	Diesel	230 hp	80%	30%	8 hrs/day											1	1	1
2 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day											1	1	1
4 ea	40 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day												1	2
4 ea	60 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day												1	2
4 ea	85 ft Manlift	Diesel	75 hp	80%	46%	8 hrs/day													1
2 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day												1	1
2 ea	Semi Tractor	Diesel	250 hp	N/A	On Road	8 hrs/day											1	1	2
4 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day												2	2
Power Block Erection (total for 2 plants)																			
2 ea	888 Manitowoc Crawler Crane	Diesel	330 hp	80%	43%	8 hrs/day													
2 ea	65 ton Rough Terrain Crane	Diesel	250 hp	80%	43%	8 hrs/day								1	1	1	2	2	2
4 ea	35 ton Rough Terrain Crane	Diesel	160 hp	80%	43%	8 hrs/day				1	2	2	3	4	4	4	4	4	4
2 ea	Front End Loader (CAT 980K)	Diesel	369 hp	80%	55%	8 hrs/day				1	1	1	2	2	2	2	1	1	1
2 ea	Excavator, Hydraulic (CAT 318E)	Diesel	120 hp	40%	70%	8 hrs/day				1	1	1	2	2	2	2	1	1	1
2 ea	Compactor (CAT CP74)	Diesel	160 hp	80%	50%	8 hrs/day					1	1	1	2	2	2	1	1	1
4 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day					1	2	2	3	4	4	4	4	4
4 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day					1	2	2	3	4	4	4	4	4
4 ea	40 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day							1	1	2	3	4	4	4
8 ea	60 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day								2	2	4	6	8	8
4 ea	85 ft Manlift	Diesel	75 hp	80%	46%	8 hrs/day									1	2	2	3	4
4 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day				1	1	2	3	3	4	4	4	4	4
4 ea	Semi Tractor	Diesel	250 hp	N/A	On Road	8 hrs/day				1	1	2	3	3	4	4	4	4	4
Common Area and Switchyard																			
1 ea	35 ton Rough Terrain Crane	Diesel	160 hp	80%	43%	8 hrs/day							1	1	1	1	1	1	1
1 ea	Excavator, Hydraulic (CAT 318E)	Diesel	120 hp	40%	70%	8 hrs/day				1	1	1	1	1	1				
1 ea	Trencher (Vermeer T555)	Diesel	185 hp	35%	60%	8 hrs/day					1	1	1	1	1				
1 ea	Elevating Scraper (CAT)	Diesel	330 hp	80%	72%	8 hrs/day				1	1								
1 ea	Bulldozer (CAT D6N)	Diesel	150 hp	40%	60%	8 hrs/day				1	1	1	1	1	1				
1 ea	Compactor (CAT CP74)	Diesel	160 hp	80%	50%	8 hrs/day					1	1	1	1	1				
1 ea	10,000 lb Forklift	Diesel	90 hp	80%	30%	8 hrs/day							1	1	1				
2 ea	60 ft Manlift	Diesel	50 hp	80%	46%	8 hrs/day							1	2	2	2	2	2	2
1 ea	400 amp Diesel Welders	Diesel	40 hp	80%	45%	8 hrs/day													
1 ea	300 cfm Air Compressor	Diesel	140 hp	80%	48%	8 hrs/day													
Miscellaneous																			
6 ea	Water Trucks (4,000 gallon)	Diesel	250 hp	60%	On Road	8 hrs/day				4	4	5	6	6	6	6	6	6	6
6 ea	Dump Truck, 12-16 YD	Diesel	325 hp	40%	On Road	8 hrs/day				2	3	3	5	6	6	6	6	6	5
8 ea	Pickup Trucks	Gasoline	250 hp	25%	On Road	8 hrs/day	2	4	4	8	8	8	8	8	8	8	8	8	8
12 ea	AWD Gators	Gasoline	25 hp	25%	50%	8 hrs/day	2	6	8	8	8	8	10	10	10	12	12	12	12
2 ea	Diesel Generator, 500 kW	Diesel	730 hp	45%	50%	8 hrs/day				1	1	1	1	1	1	2	2	2	2
8 ea	Diesel Generator, 1250 kW	Diesel	1,750 hp	45%	50%	8 hrs/day				1	2	2	3	4	4	5	6	6	7

By: CH2M HILL
Date: 18 DEC 2012
Revision: 0

14 11/14	15 12/14	16 1/15	17 2/15	18 3/15	19 4/15	20 5/15	21 6/15	22 7/15	23 8/15	24 9/15	25 10/15	26 11/15	27 12/15	28 1/16	29 2/16	30 3/16	31 4/16	32 5/16	33 6/16	TOTAL
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2					48
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2					48
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2					48
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2				52
6	6	6	6	4	2	2														86
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	8	4			392
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1			52
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	2					96
																				12
																				20
																				5
																		1	1	4
1	1	1	1																	14
20	16	10	10																	218
2	1	1	1																	12
1																				16
1	1																			18
2	1																			33
1	1																			18
																				54
4	2																			66
6	4																			102
2	2																			36
1	2	2	2	2	2	1	1	1												16
3	4	4	4	4	4	4	4	4	3	2	1									44
2	2	2	2	2	2	1	1	1												18
2	2	2	2	2	2	2	1	1	1											20
2	3	4	4	4	4	4	4	4	2	1										39
2	3	4	4	4	4	4	4	4	2	1										39
2	4	4	4	4	4	4	4	4	4	2	1									42
2	2	2	2	2	2	2	2	1	1											20
2	2	2	2	2	2	2	2	2	2	1	1									26
4	4	4	4	4	4	4	4	2	2											40
						1	1	1	2	2	1	1	1							10
2	2	2	2	2	2	2	2	2	2	2	2	1	1	1						36
4	4	4	4	4	4	4	4	4	4	4	4	3	2	2	2	2	2			93
																				14
																				14
																				12
4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	2	2	1			92
4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	2	2	1			92
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	2			88
8	8	8	8	8	8	8	8	8	6	4	2									114
4	4	4	4	4	4	4	4	4	3	2										53
4	4	4	3	3	2	2	1	1	1											55
4	4	4	3	3	2	2	1	1	1											55
1					1	1	1													11
			1	1																8
																				5
			1	1	1															5
			1	1	1															9
				1	1															7
					1	1	1													6
1					2	2	2	2												22
					1	1	1	1												4
					1	1	1	1												4
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	2	2	2	159
3	3	3																		57
8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	6	248
12	12	12	12	12	12	12	12	12	12	12	12	10	10	10	8	8	8	6	4	326
2	2																			18
8	8																			56

Table 4.1E-8 (2 pages)

Construction Personnel by Month[1]

CLIENT: BrightSource Industries Israel
PROJECT: Palen Solar Electric Generating System
DOCUMENT: 459892-PSEGS-DOC-006

BY: CH2M HILL
REV: 0
DATE: 4 DEC 2012

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	TOTAL
	10/13	11/13	12/13	1/14	2/14	3/14	4/14	5/14	6/14	7/14	8/14	9/14	10/14	11/14	12/14	1/15	2/15	3/15	4/15	5/15	6/15	7/15	8/15	9/15	10/15	11/15	12/15	1/16	2/16	3/16	4/16	5/16	6/16	
PROJECT SITE																																		
Craft Day Shift																																		
Boilermaker	0	0	4	4	5	7	9	11	11	11	12	14	30	33	45	53	64	84	110	139	163	192	191	179	152	126	98	73	53	38	30	26	16	1,967
Carpenters	1	3	8	10	16	30	50	57	67	79	82	93	88	90	87	82	78	73	69	63	53	52	44	36	33	28	23	17	13	11	9	8	5	1,453
Cement Finisher	0	3	1	2	2	5	7	8	10	12	13	13	13	13	13	13	13	11	10	9	7	7	6	5	4	4	3	2	1	1	1	1	1	213
Electrician	1	4	5	8	10	20	34	38	37	34	36	38	45	60	70	76	85	106	136	173	209	255	250	240	220	191	159	119	93	76	60	51	31	2,939
Iron Worker	0	0	0	5	10	3	13	18	26	35	41	49	53	59	64	67	72	77	81	82	76	75	65	52	53	42	33	24	17	13	11	11	7	1,227
Laborer	4	6	13	15	23	37	58	67	74	80	93	95	90	91	83	80	80	81	81	77	65	59	49	41	42	36	30	21	18	15	13	13	8	1,630
Millwright	0	0	0	2	3	5	1	1	1	0	2	2	21	27	42	50	55	64	73	81	87	95	101	97	89	75	62	48	35	30	26	26	16	1,201
Equipment Operator	1	4	8	10	13	23	34	40	41	44	47	52	52	53	51	53	56	62	67	71	70	71	65	58	52	43	35	26	19	16	13	13	8	1,263
Pipefitter	0	0	11	13	17	33	41	46	51	57	63	69	80	89	104	119	141	179	226	272	314	368	361	339	294	247	200	146	110	88	67	59	36	4,204
Teamster	1	3	3	3	4	7	10	13	13	13	14	16	17	18	17	17	18	19	20	20	19	18	16	14	12	10	8	6	5	4	4	4	2	366
Craft-Day Shift Subtotal	**8**	**23**	**53**	**72**	**103**	**170**	**257**	**299**	**331**	**365**	**403**	**441**	**489**	**533**	**576**	**610**	**662**	**756**	**873**	**987**	**1063**	**1192**	**1148**	**1061**	**951**	**802**	**651**	**482**	**364**	**292**	**234**	**212**	**130**	**16,463**
Non-craft Day Shift[2]																																		
Subcontractors	15	31	39	52	77	93	93	100	100	108	110	116	116	116	116	116	154	162	177	193	231	280	270	231	193	162	154	116	100	93	77	39	23	4,030
Owner + Others (non-manual)	13	13	27	28	32	47	64	66	70	75	84	93	99	103	104	104	105	108	108	108	108	111	107	107	94	93	91	65	56	44	35	27	16	2,389
Startup (non-manual) Labor	0	0	0	0	0	0	0	2	2	3	3	4	5	4	4	4	4	4	4	5	6	6	6	6	6	6	5	5	5	5	3	3	2	110
Compliance Support	77	77	29	29	29	29	29	29	29	29	29	29	29	29	29	77	77	29	29	19	19	20	10	10	5	5	5	5	5	5	5	5	3	861
Transmission Line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37	36	0	0	0	0	0	0	0	0	0	0	73
Gas Line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0	0	0	0	30
Linear Compliance Support	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	3	0	0	0	0	0	0	0	0	0	0	9
Non-craft Day Shift Subtotal	**105**	**121**	**95**	**109**	**138**	**169**	**186**	**197**	**201**	**215**	**226**	**242**	**249**	**252**	**253**	**301**	**340**	**303**	**318**	**325**	**364**	**490**	**432**	**354**	**298**	**266**	**255**	**191**	**166**	**147**	**120**	**74**	**44**	**7,502**
TOTAL PROJECT SITE DAY SHIFT	**113**	**144**	**148**	**181**	**241**	**339**	**443**	**496**	**532**	**580**	**629**	**683**	**738**	**785**	**829**	**911**	**1,002**	**1,059**	**1,191**	**1,312**	**1,427**	**1,682**	**1,580**	**1,415**	**1,249**	**1,068**	**906**	**673**	**530**	**439**	**354**	**286**	**174**	**23,965**
Craft Swing Shift																																		
Boilermaker	0	0	0	0	2	2	2	3	3	3	3	4	9	11	14	17	22	30	40	51	61	72	72	67	66	54	42	31	22	16	13	12	7	744
Carpenters	1	1	4	5	7	9	13	16	20	24	26	32	33	33	32	31	31	30	29	27	23	23	20	17	14	12	10	7	6	5	4	4	2	549
Cement Finisher	0	1	1	1	1	1	2	2	3	3	3	4	4	4	4	5	4	4	4	4	3	2	2	2	2	1	1	1	1	1	1	1	1	73
Electrician	0	1	2	3	5	9	14	16	17	16	18	18	23	27	31	34	37	44	57	72	86	104	102	97	94	82	67	51	40	33	25	22	13	1,247
Iron Worker	0	0	0	0	5	19	22	25	27	33	35	35	38	40	42	44	46	48	51	51	49	51	46	40	23	18	14	10	7	6	5	4	2	834
Instrument Tech	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0	0	0	0	0	228
Laborer	2	5	6	6	8	3	12	16	18	21	25	27	28	29	27	27	27	28	30	28	24	23	18	15	18	15	13	10	8	7	6	6	4	536
Millwright	0	0	0	0	1	9	10	10	10	10	10	11	16	18	24	26	28	32	36	40	42	46	48	46	38	32	27	21	15	13	12	12	7	643
Equipment Operator	0	2	3	4	6	6	11	13	14	15	17	19	19	21	21	21	23	26	29	31	30	31	28	26	22	18	15	11	9	7	6	5	3	509
Pipefitter	0	0	6	7	9	2	9	11	13	15	20	21	24	28	35	40	48	64	81	100	119	140	137	126	124	107	86	64	47	37	29	24	14	1,573
Teamster	0	0	1	1	2	2	3	4	4	4	6	6	6	6	6	6	6	7	7	8	7	7	6	5	5	4	3	2	2	2	1	1	1	130
Craft-Day Shift Subtotal	**3**	**10**	**23**	**27**	**46**	**74**	**110**	**128**	**141**	**156**	**175**	**189**	**212**	**229**	**248**	**263**	**284**	**325**	**376**	**424**	**456**	**511**	**491**	**453**	**406**	**343**	**278**	**208**	**157**	**127**	**102**	**91**	**54**	**7,066**
Non-craft Swing Shift[2]																																		
Subcontractors	4	8	10	13	19	23	23	25	25	27	29	29	29	29	29	29	39	40	44	48	58	70	67	58	48	40	39	29	25	23	19	10	6	1,008
Owner + Others (non-manual)	3	4	7	7	8	12	15	16	17	19	23	23	25	26	26	26	26	27	27	27	27	28	27	27	24	23	23	16	13	11	9	7	4	599
Startup (non-manual) Labor	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	1	1	1	1	1	1	1	1	29
Non-craft Swing Shift Subtotal	**7**	**12**	**17**	**20**	**27**	**35**	**38**	**41**	**43**	**47**	**53**	**53**	**55**	**56**	**56**	**56**	**66**	**68**	**72**	**76**	**87**	**100**	**96**	**87**	**74**	**64**	**63**	**46**	**39**	**35**	**29**	**18**	**11**	**1,636**
TOTAL PROJECT SITE SWING SHIFT	**10**	**22**	**40**	**47**	**73**	**109**	**148**	**169**	**184**	**203**	**228**	**242**	**267**	**285**	**304**	**319**	**350**	**393**	**448**	**500**	**543**	**611**	**587**	**540**	**480**	**407**	**341**	**254**	**196**	**162**	**131**	**109**	**65**	**8702**
SUBTOTAL ONSITE	**123**	**166**	**188**	**228**	**314**	**448**	**591**	**665**	**716**	**783**	**857**	**925**	**1,005**	**1,070**	**1,133**	**1,230**	**1,352**	**1,452**	**1,639**	**1,812**	**1,970**	**2,293**	**2,167**	**1,955**	**1,729**	**1,475**	**1,247**	**927**	**726**	**601**	**485**	**395**	**239**	**32,667**
OFFSITE LINEARS																																		
Transmission Line	0	3	3	3	14	35	39	28	10	10	6	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	156
Gas Line	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	12	12	12	12	12	8	0	0	0	0	0	0	0	0	0	72
Linear Compliance Support	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	6	6	6	7	4	4	4	0	2	0	0	0	0	0	45
TOTAL OFFSITE LINEARS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5**	**5**	**29**	**40**	**61**	**18**	**19**	**12**	**4**	**4**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**273**
TOTAL WORKFORCE	**123**	**166**	**188**	**228**	**314**	**448**	**591**	**665**	**716**	**783**	**857**	**925**	**1,005**	**1,070**	**1,133**	**1,230**	**1,357**	**1,457**	**1,668**	**1,852**	**2,031**	**2,311**	**2,186**	**1,967**	**1,733**	**1,479**	**1,247**	**929**	**726**	**601**	**485**	**395**	**239**	**32,940**
Car Pool % (Day-shift Only)[3]	**7.5%**																																	
Worker (day shift)	100	131	121	153	209	292	379	428	460	502	542	586	634	678	721	803	893	947	1079	1199	1313	1492	1428	1302	1149	969	810	603	469	390	316	256	156	21,254
Worker Vehicles	93	121	112	142	193	270	351	396	426	464	501	542	586	627	667	743	826	876	998	1109	1215	1380	1321	1204	1063	896	749	558	434	361	292	237	144	19,660

Construction Personnel by Month[1]

CLIENT: BrightSource Industries Israel
PROJECT: Palen Solar Electric Generating System
DOCUMENT: 459892-PSEGS-DOC-006

BY: CH2M HILL
REV: 0
DATE: 4 DEC 2012

Month	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	TOTAL
	10/13	11/13	12/13	1/14	2/14	3/14	4/14	5/14	6/14	7/14	8/14	9/14	10/14	11/14	12/14	1/15	2/15	3/15	4/15	5/15	6/15	7/15	8/15	9/15	10/15	11/15	12/15	1/16	2/16	3/16	4/16	5/16	6/16	
Monthly Truck Traffic																																		TOTAL
Equipment & Materials	35	35	440	440	420	407	472	438	411	112	120	133	148	141	137	165	171	135	127	122	98	94	91	65	55	43	36	28	28	10	8	6	4	**5,136**
Concrete[4]	0	20	40	6	10	10	16	20	20	20	20	20	20	20	16	10	10	20	10	10	10	10	5	5	0	0	0	0	0	0	0	0	0	**348**
Heliostat Components	0	0	0	0	245	245	245	245	245	245	246	246	246	246	246	246	246	245	245	245	245	245	245	0	0	0	0	0	0	0	0	0	0	**4,662**
TOTAL TRUCK TRAFFIC	35	55	480	446	675	662	733	703	676	377	386	399	414	407	399	421	427	400	382	377	353	349	341	70	55	43	36	28	28	10	8	6	4	**10,146**
Average Daily Trucks (rounded)	**2**	**3**	**23**	**21**	**32**	**32**	**35**	**33**	**32**	**18**	**18**	**19**	**20**	**19**	**19**	**20**	**20**	**19**	**18**	**18**	**17**	**17**	**16**	**3**	**3**	**2**	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**15**

Notes: [1] Based on revised Hidden Hills Project Data submitted to CEC on 1 October 2012
[2] Non-craft workers are the non-union superintendents and construction personnel on site.
[3] Car Pool includes Day-shift Craft Workers + Subcontractor Non-craft Workers + Compliance Support
[4] Concrete deliveries based on concrete deliveries from an onsite concrete batch plant from months 4 to 17.

Onsite Workforce	
Average Workforce =	**990**
Peak Workforce =	**2,293**
Total Workforce	
Average Workforce =	**998**
Peak Workforce =	**2,311**

Table 4.1E-9

Title : Riv2014
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2012/10/01 13:10:07
Scen Year: 2014 -- All model years in the range 1970 to 2014 selected
Season : Annual
Area : Riverside County Average
I/M Stat : Enhanced Interim (2005) -- Using I/M schedule for area 61 Riverside (SC)
Emissions: Tons Per Day

	Light Duty Passenger Cars				Light Duty Trucks				Medium Duty Trucks				Heavy Duty Trucks: Gasoline Trucks			Heavy Duty Trucks: Diesel Trucks	Heavy Duty Trucks: Total HD Trucks	Urban Buses	Motor-cycles	All Vehicles
	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Diesel	Total	Non-cat	Cat	Total					
Vehicles	2224.	761737.	1113.	765074.	2259.	498446.	6620.	507325.	823.	221058.	12087.	233968.	360.	23267.	23626.	38139.	61766.	365.	71974.	1640470.
VMT/1000	35.	30222.	27.	30284.	50.	21395.	226.	21671.	18.	9078.	497.	9593.	4.	445.	449.	4926.	5374.	47.	724.	67693.
Trips	8580.	4796510.	5916.	4811010.	8754.	3128060.	39688.	3176500.	5123.	2159080.	147692.	2311900.	6779.	156092.	162871.	405417.	568288.	1459.	143933.	11013100.
Reactive Organic Gas Emissions																				
Run Exh	0.24	0.98	0.00	1.23	0.37	1.13	0.02	1.51	0.16	0.65	0.06	0.87	0.02	0.18	0.20	3.19	3.39	0.07	2.35	9.41
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.00	0.01	0.01	0.46	0.47	0.00	0.00	0.51
Start Ex	0.05	1.34	0.00	1.39	0.05	1.15	0.00	1.20	0.03	0.94	0.00	0.97	0.07	0.22	0.29	0.00	0.29	0.00	0.34	4.19
Total Ex	0.29	2.32	0.00	2.62	0.42	2.27	0.02	2.71	0.20	1.63	0.06	1.88	0.09	0.41	0.50	3.65	4.15	0.08	2.68	14.11
Diurnal	0.02	0.48	0.00	0.50	0.02	0.36	0.00	0.38	0.00	0.14	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.17	1.20
Hot Soak	0.03	0.72	0.00	0.75	0.03	0.52	0.00	0.55	0.01	0.22	0.00	0.23	0.00	0.00	0.01	0.00	0.01	0.00	0.05	1.59
Running	0.15	1.70	0.00	1.85	0.08	2.12	0.00	2.19	0.02	1.19	0.00	1.21	0.03	0.07	0.10	0.00	0.10	0.00	0.21	5.56
Resting	0.01	0.32	0.00	0.33	0.01	0.25	0.00	0.27	0.00	0.10	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.79
Total	0.50	5.54	0.00	6.05	0.56	5.53	0.02	6.10	0.22	3.27	0.06	3.56	0.13	0.49	0.62	3.65	4.27	0.08	3.20	23.25
Carbon Monoxide Emissions																				
Run Exh	2.86	48.42	0.02	51.30	4.13	52.16	0.14	56.43	2.56	22.72	0.38	25.66	0.64	4.43	5.06	14.00	19.06	0.72	24.53	177.70
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.01	0.25	0.00	0.05	0.05	2.06	2.11	0.00	0.00	2.36
Start Ex	0.29	17.60	0.00	17.89	0.30	15.99	0.00	16.29	0.28	11.28	0.00	11.56	0.65	3.68	4.33	0.00	4.33	0.07	1.55	51.69
Total Ex	3.14	66.02	0.02	69.18	4.43	68.16	0.14	72.73	2.84	34.24	0.39	37.47	1.29	8.15	9.44	16.06	25.51	0.78	26.08	231.75
Oxides of Nitrogen Emissions																				
Run Exh	0.17	3.94	0.04	4.15	0.24	5.66	0.37	6.27	0.13	3.22	2.22	5.57	0.02	1.02	1.04	45.34	46.38	0.45	0.93	63.74
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.04	0.00	0.00	0.00	5.32	5.32	0.00	0.00	5.35
Start Ex	0.01	1.24	0.00	1.25	0.01	1.42	0.00	1.43	0.01	2.29	0.00	2.30	0.01	0.48	0.49	0.00	0.49	0.01	0.05	5.53
Total Ex	0.18	5.18	0.04	5.40	0.25	7.07	0.37	7.70	0.14	5.51	2.25	7.90	0.03	1.51	1.53	50.66	52.19	0.46	0.98	74.63
Carbon Dioxide Emissions (000)																				
Run Exh	0.02	12.72	0.01	12.75	0.03	11.35	0.09	11.46	0.01	6.56	0.28	6.85	0.00	0.31	0.31	9.57	9.88	0.08	0.13	41.14
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.30	0.30	0.00	0.00	0.31
Start Ex	0.00	0.38	0.00	0.38	0.00	0.31	0.00	0.31	0.00	0.21	0.00	0.21	0.00	0.01	0.01	0.00	0.01	0.00	0.01	0.92
Total Ex	0.02	13.10	0.01	13.13	0.03	11.66	0.09	11.77	0.01	6.77	0.28	7.07	0.00	0.32	0.32	9.87	10.19	0.08	0.13	42.37
PM10 Emissions																				
Run Exh	0.00	0.41	0.00	0.42	0.00	0.61	0.01	0.62	0.00	0.26	0.01	0.27	0.00	0.00	0.00	2.00	2.00	0.01	0.02	3.34
Idle Exh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.05
Start Ex	0.00	0.04	0.00	0.04	0.00	0.05	0.00	0.05	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
Total Ex	0.00	0.45	0.00	0.46	0.00	0.66	0.01	0.68	0.00	0.28	0.02	0.30	0.00	0.00	0.00	2.05	2.05	0.01	0.02	3.51
TireWear	0.00	0.27	0.00	0.27	0.00	0.19	0.00	0.19	0.00	0.09	0.01	0.09	0.00	0.01	0.01	0.18	0.18	0.00	0.00	0.74
BrakeWr	0.00	0.42	0.00	0.42	0.00	0.30	0.00	0.30	0.00	0.13	0.01	0.13	0.00	0.01	0.01	0.14	0.15	0.00	0.01	1.00
Total	0.00	1.14	0.00	1.14	0.00	1.15	0.02	1.17	0.00	0.49	0.03	0.52	0.00	0.02	0.02	2.36	2.38	0.01	0.03	5.25
Lead	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SOx	0.00	0.13	0.00	0.13	0.00	0.11	0.00	0.11	0.00	0.07	0.00	0.07	0.00	0.00	0.00	0.09	0.10	0.00	0.00	0.41
Fuel Consumption (000 gallons)																				
Gasoline	2.80	1352.31	0.00	1355.10	3.91	1205.08	0.00	1208.99	1.98	699.55	0.00	701.53	0.66	33.91	34.57	0.00	34.57	2.49	18.80	3321.48
Diesel	0.00	0.00	0.95	0.95	0.00	0.00	7.78	7.78	0.00	0.00	25.45	25.45	0.00	0.00	0.00	888.14	888.14	4.91	0.00	927.22

Table 4.1E-10

EMFAC Composite Emissions Factor Conversion

EMFAC 2007, V2.3, Nov 2006

County: Riverside
Year: 2014
Model Years: 1970-2014

EMFAC Burden Output

		LDP(gas)	LDP(diesel)	LDT(gas)	LDT(diesel)	MDT(gas)	MDT(diesel)	HDT(gas)	HDT(diesel)	Buses	Motorcycles
Daily VMT/1000		30257	27	21445	226	9066	497	449	4926	47	724
Daily VMT		30257000	27000	21445000	226000	9066000	497000	449000	4926000	47000	724000
ROG, tpd		6.04	0.01	6.08	0.02	3.5	0.06	0.62	3.65	0.08	3.2
CO, tpd		69.16	0.02	72.59	0.14	37.08	0.39	9.44	16.06	0.78	26.08
NOx, tpd		5.36	0.04	7.33	0.37	5.65	2.25	1.53	50.66	0.46	0.98
CO2, tpd	(x 1000) >	13120	10	11680	90	6790	280	320	9870	80	130
PM10, tpd		1.14	0.01	1.15	0.02	0.49	0.03	0.02	2.36	0.01	0.03
SOx, tpd		0.13	0.01	0.11	0.01	0.07	0.01	0.01	0.09	0.01	0.01

Composite EFs

	LDP(gas) g/VMT	LDP(diesel) g/VMT	LDT(gas) g/VMT	LDT(diesel) g/VMT	MDT(gas) g/VMT	MDT(diesel) g/VMT	HDT(gas) g/VMT	HDT(diesel) g/VMT	Buses g/VMT	Motorcycles g/VMT
ROG	0.1811	0.0003	0.2572	0.0008	0.3502	0.0018	1.2527	0.6722	1.5441	4.0096
CO	2.0736	0.0006	3.0707	0.0059	3.7104	0.0117	19.0730	2.9576	15.0553	32.6785
NOx	0.1607	0.0012	0.3101	0.0157	0.5654	0.0675	3.0913	9.3296	8.8788	1.2280
CO2	393.4	0.3	494.1	3.8	679.4	8.4	646.5	1817.7	1544.1	162.9
PM10	0.0342	0.0003	0.0486	0.0008	0.0490	0.0009	0.0404	0.4346	0.1930	0.0376
SOx	0.0039	0.0003	0.0047	0.0004	0.0070	0.0003	0.0202	0.0166	0.1930	0.0125

Composite EFs

	LDP(gas) lb/VMT	LDP(diesel) lb/VMT	LDT(gas) lb/VMT	LDT(diesel) lb/VMT	MDT(gas) lb/VMT	MDT(diesel) lb/VMT	HDT(gas) lb/VMT	HDT(diesel) lb/VMT	Buses lb/VMT	Motorcycles lb/VMT
ROG	0.000399	0.000001	0.000567	0.000002	0.000772	0.000004	0.002762	0.001482	0.003404	0.008840
CO	0.004572	0.000001	0.006770	0.000013	0.008180	0.000026	0.042049	0.006521	0.033191	0.072044
NOx	0.000354	0.000003	0.000684	0.000035	0.001246	0.000149	0.006815	0.020568	0.019574	0.002707
CO2	0.8672	0.0007	1.0893	0.0084	1.4979	0.0185	1.4254	4.0073	3.4043	0.3591
PM10	0.000075	0.000001	0.000107	0.000002	0.000108	0.000002	0.000089	0.000958	0.000426	0.000083
SOx	0.000009	0.000001	0.000010	0.000001	0.000015	0.000001	0.000045	0.000037	0.000426	0.000028

Weighted Avg LDP/LDT Gasoline EFs

	g/VMT	lb/VMT	Calc 1	0.415
ROG	0.213	0.00047	Calc 2	0.585
CO	2.487	0.00548		
NOx	0.223	0.00049		
CO2	435.1	0.95934		
PM10	0.040	0.00009		
SOx	0.004	0.00001		

	LDP(gas)	LDP(diesel)	LDT(gas)	LDT(diesel)	MDT(gas)	MDT(diesel)	HDT(gas)	HDT(diesel)	Buses	Motorcycles
Annual VMT	1.10E+10	9.86E+06	7.83E+09	8.25E+07	3.31E+09	1.81E+08	1.64E+08	1.80E+09	1.72E+07	2.64E+08
Daily Fuel Use, 10^3 gal	1355.1	0.95	1208.99	7.78	701.53	25.45	34.57	888.14	4.91	18.8
Daily Fuel Use, gals	1355100	950	1208990	7780	701530	25450	34570	888140	4910	18800
Annual Fuel Use, gals	494611500	346750	441281350	2839700	256058450	9289250	12618050	324171100	1792150	6862000
Average Miles/gallon	22.3	28.4	17.7	29.0	12.9	19.5	13.0	5.5	9.6	38.5