Tessera Solar™
power from stirling energy systems

DOCKET
08-AFC-13
DATE NOV 23 2009
RECD. NOV 24 2009

November 23, 2009

Mr. Christopher Meyer
CEC Project Manager
Attn: Docket No. 08-AFC-13
California Energy Commission
1516 Ninth Street
Sacramento, CA 95814-5512

Mr. Jim Stobaugh
BLM Project Manager
Attn: Docket No. 08-AFC-13
Bureau of Land Management
P.O. Box 12000
Reno, NV 89520

RE: SES Solar One Project
Applicant's Responses to CEC and BLM Data Requests Set 1, Part 1 and Set 2, Part 1
Data Requests 71-73, 76-79, 85, and 128-141

Dear Mr. Meyer and Mr. Stobaugh,

Tessera Solar hereby submits the Applicant's responses to CEC and BLM Data Request Set 1, Part 1 and Set 2, Part 1; Data Requests 71-73, 76-79, 85, and 128-141. I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge.

Sincerely,

Camille Champion
Project Manager

SES Solar One

In Response to CEC & BLM Data Requests Data Requests 71-73, 76-79, 85, and 128-141

Application for Certification (08-AFC-13)

November 2009

Submitted to:
Bureau of Land Management
2601 Barstow Road
Barstow, CA 92311

Submitted to:
California Energy Commission
1516 9th Street, MS 15
Sacramento, CA 95814-5504

Submitted by:
SES Solar Three, LLC
SES Solar Six, LLC

Stirling Energy Systems
4800 N. Scottsdale Road, Suite 5500
Scottsdale, AZ 85251

SES Solar One
Responses to CEC and BLM Data Requests
Data Requests 71-73, 76-79, 85, and 128-141
08-AFC-13

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 71: Please explain how Solar One determined that a sufficient volume of groundwater is available for project use, where that water will be obtained, and at what rate the water will be produced.

Response: Research by URS has found that there are limited data available for the site vicinity regarding well yields in the groundwater basin, since so little development has occurred in the basin. The volume of water available for site use will be evaluated based on the results of aquifer testing that will be completed following installation of a test well. The test well is anticipated to be installed by mid-December 2009.

The limited data available at the project site and in nearby groundwater basins suggests that the depth to groundwater is likely to range from 100 to 400 feet below the ground surface at the site, generally increasing in depth to the east and south (further from the mountains). Well yields are likely to provide the water requirements for the project. California Department of Water Resources (DWR) Bulletin 118 for the Lavic Lake Groundwater Basin indicates that the total storage capacity of the basin is approximately 270,000 acre-feet (af) with an estimated recharge of approximately 300 acre-feet per year (afy). Proposed water use for the project is approximately 36 afy (daily average of approximately 26 gpm and maximum of approximately about 44 gpm), which is approximately 12 percent of the recharge. Due to the limited number of other groundwater uses in the basin it is anticipated that a sufficient volume of water will be available for the project through installation of single or multiple groundwater wells.

Prior to initiating well drilling, the Applicant has explored three alternative options; BNSF (both recycled and groundwater), other sources of recycled water, and Cadiz groundwater. First, the applicant worked through Mojave Water Agency (MWA) to bring in water. It was recommended that BNSF had existing wells and an existing right to export. Through communications with BNSF, the Applicant learned that reclaimed water was potentially available on the BNSF site. The Applicant attempted to use BNSF's reclaimed water as the Project's water sources but was met with political resistance. The Applicant then worked towards using BNSF's existing rights to export groundwater, but the process has been slowed by controversy over the exportation out of the MWA service area. Second, the Applicant contacted other purveyors of recycled water, including the City of Barstow, but again was met with political resistance from constituents. Finally, the Applicant is investigating purchasing water from BNSF's Cadiz well. The source is outside of MWA jurisdiction and water could be trucked or brought on-site via rail. This third option is serving as a back-up water supply depending on the results of the well testing.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 72: Once constructed, please provide the aquifer data derived from testing of the primary water well.

Response: The Applicant has secured a contract with a local well driller and drilling on-site is anticipated to start during the end of November 2009. Once information is secured from the well and lab work, it will be provided to the CEC and BLM. It is anticipated that this information will be available during the end of December or early January.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 73: Please provide an explanation of how the use of the primary well for project construction and operation will not create a significant environmental impact.

Response: Once the proposed test well is installed, developed and tested, and the aquifer characteristics evaluated, an estimate of the cone of influence resulting from pumping will be estimated. The test well is anticipated to be installed by mid-December 2009.

Considering that there are no operational wells in the near vicinity to the project and the relatively low number for production wells in the Lavic Groundwater Basin, the anticipated water use for the Project during operation of 36 afy (daily average of approximately 26 gpm and maximum of approximately about 44 gpm) is not anticipated to create a significant environmental impact. With regard to nearby communities or wells, no significant impact would be expected based on the results of the initial studies, which indicate there are no known active wells within the Lavic Valley basin in the vicinity of the site. Further, groundwater within the basin appears to be structurally separated from the basins to the east and west, decreasing the potential for impact to those basins.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 76: Please provide the daily, monthly and cumulative volume of water expected to be used during the construction period.

Response: Please see the response to Data Request 72.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 77: Please describe the locations and well construction details of the proposed additional wells.

Response: The proposed location of an additional water supply well is shown on attachment SWR-1, located behind this response. The proposed location of Well #1 is in T8N R5E Section 12. The proposed location of Well #2 (currently preferred primary well location) is in T8N, R6E Section 6. Well construction details will be provided after test well construction. The attached well development program specifies the well drilling, installation, development and aquifer testing procedures.

SWR-1

HECTOR RD

N.A.P.

Solar 1 (Phase 2)

Solar 1 (Phase 1)

Proposed Main Services Complex

Proposed Well #2 (556158,3852216)

Proposed Well #1 (554677,3850956)

Proposed Solar One Substation

Proposed Satellite Services Complex

PISGAH RD

NATIONAL TRAILS HWY

Pisgah Substation

LEGEND

- Proposed Water Well (UTM NAD83 Zone 11 Coordinates)
- Project Boundary
- N.A.P. (Not a Part)
- Alquist Priolo Zone
- Alquist Priolo Faults
- Road
- BNSF Railroad

SOURCES:
Stantec Engineering (project site Oct. 2008);
TIGER (railroad 2000); ESRI (overview);
USGS (Alquist- Priolo faults and geology);
USDA (NAIP aerial 2005).

PROPOSED WATER WELL LOCATIONS SOLAR ONE AND THREE PROJECTS

URS

2500 0 2500 5000 Feet

SCALE: 1" = 5000' (1:60,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 07-07-09	FIG. NO: 2
PM: WM	PROJ. NO: 27658189.40001	

Path: G:\gis\projects\15772765\8100 mxd\Water waterwell_locs_20090707.mxd, 07/07/09, lisa_garvey

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 78: Please provide the decision making process for determining if additional (production) wells will be needed.

Response: Following completion of the aquifer testing of the proposed water supply well, the data will be evaluated to estimate the sustainable well yield. If the well yield is less than 125 percent of the water needed during construction of the facility, then installation of an additional well(s) at the proposed location shown on attachment SWR-1 will be considered. The test well is anticipated to be installed by mid-December 2009.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 79: Please provide the procedure and scheduling for installing the additional (production) wells.

Response: The test well drilling program is anticipated to be installed by mid-December 2009. A report of the findings can be provided to CEC and BLM during the first quarter of 2010. Once the report of findings is finalized and if a need for additional wells is identified, the Applicant will submit information the CEC and BLM on an anticipated procedure and schedule.

TECHNICAL AREA: SOIL AND WATER RESOURCES

Data Request 85: Please discuss whether project groundwater use would impact these seasonal lakes and riparian vegetation.

Response: Once the proposed test well is installed, developed and tested, and the aquifer characteristics evaluated, an evaluation of potential impacts on the seasonal lakes (playas) and riparian vegetation will be conducted.

A playa system occurs west of the project site, approximately one mile from the boundary of the project site. These playas are not within areas of direct impact from the project. These playas appear to be primarily supported by direct rainfall in many years using U.S. Army Corps of Engineers hydrogeomorphological (HGM) classifications, and they may also receive surface runoff from several areas during larger storm events (10-year storm event or greater). Groundwater does not appear to be a major factor in the expression of surface water in these playas.

The site is within two different hydrologic regions, depending on whether surface water or groundwater is being considered. With respect to surface water, the site is located in the Troy Valley Hydrologic Subarea of the Newberry Springs Hydrologic Area of the Mojave Hydrologic Unit of the Lahontan Hydrologic Region. For groundwater, the site was previously within the Troy Valley Groundwater Basin, however, a reclassification places the site within the Lavic Valley Groundwater Basin, part of the Colorado River Hydrologic Region located to the south. The Troy Valley basin was incorporated into Lower Mojave River Valley Groundwater Basin to the west, now divided from the Lavic Valley basin by the Pisgah fault. The Pisgah fault serves as a barrier to groundwater flow. Therefore seasonal lakes such as Troy Lake west of the fault will not be affected by groundwater pumping at the site that will occur east of the Pisgah fault.

Lavic Lake is a seasonal lake within the basin from which the project will pump groundwater. Lavic Lake is outside of the project limits and the proposed well location. In addition to the distance that the site is from Lavic Lake, there is a low likelihood that project groundwater use would impact it. In the Basin and Range, the floors of the valleys are characterized as having playas that are seasonally flooded as a result of storm events. The playas are also located in the lowest portions of the basins where runoff flow velocities are low, and as a result, thick layers of clay are deposited. Evaporites also form through the evaporation of the standing surface waters that are also of limited permeability. These clay deposits serve as an aquitard, a barrier to downward or upward migration of surface water or groundwater. Therefore the aquifer from which the Applicant will pump groundwater for site use is not connected to the surface water that is present seasonally in Lavic Lake.

TECHNICAL AREA: AIR QUALITY

Data Request 128: Please provide information on the types and composition of the geotextiles that would be proposed for use at the site. Information should include referencing manufacturer websites as appropriate and available.

Response: The specific vendor and product to be used for the geotextiles is not yet determined. However, the following options are typical of the product to be used. US Fabrics manufactures a woven geotextile that is called “driveway fabric” made of 100% polypropylene slit film yarns. The manufacturer’s website is www.usfabricsinc.com and a brochure describing the product is attached. Contech manufactures both woven and non-woven geotextiles which can be used for this application. The manufacturer’s website is www.contech-cpi.com.

TECHNICAL AREA: AIR QUALITY

Data Request 129: Please describe in greater detail the purpose and method of the geotextile use, the soil or road use conditions that favor its use, and the amount of geotextile that would be applied per unit area including the number of geotextile layers that might be used.

Response: The purpose of geotextile use is to stabilize the sand below the road base in order to prevent shifting of the road. Most geotextiles function to separate, stabilize and filtrate (please see the figure in the attached brochure on driveway fabric). Woven geotextiles are generally preferred for applications where high strength properties are needed, but where filtration requirements are less critical and planar flow is not a consideration. Under heavy traffic and construction loads, woven geotextiles reduce localized shear failure in weak subsoil conditions, improving construction over soft subsoil and providing access to remote areas through separation. Non-woven geotextiles are needle-punched, continuous filament engineering fabrics capable of providing planar water flow in addition to their soil stabilization and separation functions. Typical applications include access roads, aggregate drains, asphalt pavement overlays, and erosion control.

At Solar One, the geotextile is intended to be a barrier between the native sand and the stabilized soil used to create the access roads throughout the project site. Final design is not yet completed, but it is anticipated that one layer of geotextile will be required.

TECHNICAL AREA: AIR QUALITY

Data Request 130: Please describe the assumed decommissioning required for the embedded geotextiles during project decommissioning. This should include information on the natural decomposition of the geotextiles if their removal would not be proposed during decommissioning.

Response: A decommissioning plan for Solar One is provided as attachment AQ-1. Decommissioning of the Project will comply with CEC and BLM requirements, including the removal of geotextiles, if necessary.

AQ-1

FACILITY CLOSURE – SOLAR ONE (CALICO)

As with any power plant, at some point the Solar One (Calico) facility will reach its economic or useful lifetime, cease operation, and shut down. This "planned closure" will occur with adequate advanced warning and will allow sufficient time for planning the projects closure with full participation of the appropriate agencies and input from the public to ensure minimal environmental impacts and compliance with all applicable laws, ordinances, regulations, and standards. As identified by the CEC in previous siting cases, there may be a variety of circumstances where there is either an "unplanned temporary closure" or an "unplanned permanent closure**."**

The focus of this discussion is to identify SES/Tessera Solar's goals for both planned and unplanned closure and identify the actions proposed to comply with the Bureau of Land Management and Energy Commission's expectations for facilitating orderly closure under any circumstance.

Closure Objectives

SES/Tessera Solar's primary concern related to planned or unplanned facility closure is to ensure that:

1. Materials maintained onsite which might present risks to public health and safety and the environment are properly stored and disposed, and
2. The site is secured to prevent unauthorized access and risk to public health and safety.

For planned closure, the applicant will also seek to remove structures and facilities consistent with the applicable legal requirements and planned uses of the site at the time of closure.

Planned Closure

As identified above, planned closure of Solar One (Calico) will occur at the end of its useful economic or mechanical life. A planned closure would end plant operations with no intent to restart operations. At that time, the facility will be closed in an orderly manner.

To ensure the planned facility closure does not create adverse impacts, SES/Tessera Solar will submit a proposed facility closure plan to the Bureau of Land Management and Energy Commission for review and approval at least 12 months prior to commencement of closure activities and coordinate closure activities with the Bureau of Land Management, Energy Commission, San Bernardino County, and other applicable agencies. The closure plan will identify and discuss:

- A list and schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
- Any facilities or equipment intended to remain on site after closure, the reason and any future use, and any monitoring and inspection of these facilities and equipment;

- Any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to any facilities, equipment, or other project related remnants that will remain at the site;
- Details on the habitat restoration plan for the site including the timing of habitat restoration and habitat restoration performance criteria; and
- Conformance of the plan with the Bureau of Land Management's right-of-way grant, applicable conditions of certification, and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of facility closure.

In addition to all permit and lease requirements, the closure plan will assess the range of available options and consider local/regional plans in existence at the time of closure, proposed uses of the site, and comments of agencies and the public.

Unplanned Temporary Closure

An unplanned temporary closure would occur if the Solar One (Calico) facility were closed suddenly or unexpectedly for a limited time, typically for a period greater than required for normal maintenance. This is expected to happen only due to unforeseen circumstances such as a natural disaster or an emergency.

Consistent with previous Energy Commission requirements, SES/Tessera Solar will develop a contingency plan to ensure that all appropriate and necessary steps to mitigate public health, safety, and environmental impacts are taken in a timely manner. SES/Tessera Solar will submit the contingency plan to the Bureau of Land Management and Energy Commission no less than 60 days before the commencement of commercial operation for their review and approval. This plan will be kept on site and at SES/Tessera Solar's administrative offices at all times. It will be reviewed annually and updated as necessary and consistent with changes in materials stored and applicable legal requirements.

If an unplanned temporary closure occurs, SES/Tessera Solar will notify the Bureau of Land Management and California Energy Commission and any other responsible agencies by telephone, fax, or e-mail within 24 hours. SES/Tessera Solar will identify the causes and circumstances related to the closure and the expected duration of the closure. As part of the contingency plan, SES/Tessera Solar will describe procedures to immediately secure and provide monitoring of the facility from trespassing or encroachment. If the unplanned closure lasts for more than 90 days or other time agreed to with the Bureau of Land Management and the Energy Commission, SES/Tessera Solar will remove hazardous materials and hazardous wastes from the site, drain all chemicals from storage tanks and other equipment, safely shutdown and store all equipment, and provide on-site security.

The contingency plan will describe the nature and extent of any proposed insurance coverage or other mechanism to fund unplanned closure activities and any major equipment warranties. SES/Tessera Solar will annually update the Bureau of Land Management and Energy Commission on the status of the approved mechanism to fund

closure activities and major equipment warranties.

Unplanned Permanent Closure

An unplanned permanent closure would occur if Solar One (Calico) were to close suddenly or unexpectedly on a permanent basis. This is expected to happen only due to unforeseen circumstances such as severe natural disaster or economic crisis. An unplanned permanent closure would end plant operations with no intent to restart operations.

In the event of an unplanned permanent closure, SES/Tessera Solar will notify the Bureau of Land Management, the Energy Commission and other responsible agencies, by telephone, fax, or e-mail, within 24 hours. SES/Tessera Solar will identify the causes and circumstances related to the permanent closure and implement the contingency plan. SES/Tessera Solar will also develop and submit a closure plan, consistent with the requirements for a planned closure, to the Bureau of Land Management and the Energy Commission within 90 days of the permanent closure or other time agreed to by the Bureau of Land Management and the Energy Commission.

TECHNICAL AREA: AIR QUALITY

Data Request 131: Please clearly describe the assumed/proposed timing of road stabilization during construction and the related emission control assumptions used for the on-site road travel fugitive dust emission calculations for construction. Specifically, discuss whether the unpaved roads will be constructed and stabilized prior to initiating all other construction activities that would be accessed by these roads.

Response: Preparation and stabilization of the access roads will be among the first tasks of construction. The unpaved roads will be constructed and stabilized prior to initiating all other construction activities that would be accessed by these roads, i.e., rows of SunCatchers will be installed only after the access roads to those areas are completed.

Emissions resulting from the preparation/construction of the access roads have been included in the grading and excavating tasks. A polymeric sealant, such as Soiltac® or a product with the same or better performance, will be applied to all unpaved roads during construction, to create a concrete-like surface that reacts like a paved road. Therefore, these roads can effectively be treated as paved roads to estimate fugitive dust emissions. The on-site road travel fugitive dust emission estimates were calculated using the EPA AP-42 Section 13.2.1 emission factor calculation method. Detailed assumptions and emission calculations can be found in the attachment of Data Request 136 responses.

SES Solar One
Responses to CEC and BLM Data Requests
Data Requests 71-73, 76-79, 85, and 128-141
08-AFC-13

TECHNICAL AREA: ALTERNATIVES

Data Request 132: Please fill in the table below to compare the alternative sites with the proposed project using the criteria developed by the environmental community:

Response: Please see Table 1, provided below. The Applicant will provide additional analysis for the sites described below and additional alternative sites to aid CEC and BLM with the development of an alternatives discussion in December, 2009.

Table 1
Alternative Sites Criteria Analysis

Environmental Criteria	Proposed Project Site	AS1: Camp Rock Rd	AS2: Upper Johnson Valley	AS3: West of Twentynine Palms	AS4: I-40 South	AS5: Broadwell Lake
Is site mechanically disturbed?	No[1]	No[1]	No[1]	No[1]	No[1]	No[1]
Is site located adjacent to degraded and impacted private lands?	Yes (located adjacent to I-40 and the BNSF railroad)[1]	No[1]	No[1]	No[1]	No[1]	No[1]
Is site a Brownfield?	No	No	No	No	No	No
Is site located adjacent to urbanized areas (indicate distance)?	No[2]	No[2]	No[2]	No[2]	No[2]	No[2]
Does site require the building of new roads (indicate length)?	Pisgah Rd and Hector Rd are adjacent to site	3 miles to Harrod Rd[10]	9.5 miles to State Hwy 247[10]	11.5 miles to I-40[10]	.5 miles to I-40[10]	5 miles to I-40[10]
Could site be served by existing substations (indicate name and distance)?	Pisgah substation on site[3]	No[3]	West Frys Wind Farm approx 9.5 miles[3]	No[3]	Pisgah Substation approx 3 miles[3] Broadwell Lake Substation approx 9.5 miles[3]	Pisgah Substation approx 6 miles[3]
Is site located proximate to sources of municipal wastewater (indicate name and distance)? [11]	No	Unknown	Unknown	Unknown	Unknown	Unknown
Is site located proximate to load centers (indicate name and distance?)	No	No	No	No	No	No

Table 1
Alternative Sites Criteria Analysis

Environmental Criteria	Proposed Project Site	AS1: Camp Rock Rd	AS2: Upper Johnson Valley	AS3: West of Twentynine Palms	AS4: I-40 South	AS5: Broadwell Lake
Is site located adjacent to federally designated corridors with existing transmission lines?	Yes[4 5]	Yes[4]	Yes[4]	No[4]	Yes[4 5]	No[4]
Does site support sensitive biological resources, including federally designated and proposed critical habitat; significant populations of federal or state threatened and endangered species, significant populations of sensitive, rare and special status species and rare or unique plant communities?	No critical habitat[6] Desert tortoise, emory's crucifixion-thorn, small-flowered androstephium, white-margined beardtongue[7]	No critical habitat[6] Desert tortoise[7]	No critical habitat[6] Desert tortoise[7]	No critical habitat[6] Desert tortoise[7]	No critical habitat[6] Desert tortoise, purple-nerve cymopterus[7]	No critical habitat[6] Desert tortoise, emory's crucifixion-thorn, small-flowered androstephium, white-margined beardtongue[7,] Mojave Fringed-Toed Lizard
Is site within an Area of Critical Environmental Concern, Wildlife Habitat Management Area, proposed HCP and NCCP Conservation Reserves?	West Mojave HCP[6]	Ord-Rodman DWMA[4], West Mojave HCP[6]	West Mojave HCP[6]	West Mojave HCP[6]	Ord-Rodman DWMA[4], West Mojave HCP[6]	Pisgah ACEC[4], West Mojave HCP[6]
Does site contain land purchased for conservation including those conveyed to BLM?	Yes[4]	Yes[4]	No[4]	Yes[4]	No[4]	Yes[4]
Does site contain landscape-level biological linkage areas required for the continued functioning of biological and ecological processes?	No	Potentially; portions north of the Transmission Line	No	No	No	Yes
Is the site within Proposed Wilderness Area, proposed National Monuments, and Citizens' Wilderness Inventory Areas	No[4]	No[4]	No[4]	No[4]	No[4]	No[4]

Table 1
Alternative Sites Criteria Analysis

Environmental Criteria	Proposed Project Site	AS1: Camp Rock Rd	AS2: Upper Johnson Valley	AS3: West of Twentynine Palms	AS4: I-40 South	AS5: Broadwell Lake
Does the site contain wetlands and riparian areas, including the upland habitat and groundwater resources required to protect the integrity of seeps, springs, streams or wetlands?	Lavic Valley GWBasin[8], No wetlands[9]	Lucerne Valley GWBasin[8], No wetlands[9]	Johnson Valley GWBasin[8], No wetlands[9]	Bessemer Valley GWBasin[8], No wetlands[9]	Lower Mojave River & Lavic Valley GWBasins[8], No wetlands[9]	Broadwell Valley GWBasin[8], No wetlands[9], Near Broadwell Dry Lake[1]
Is the site a National Historic Register eligible site and does it contain other known cultural resources?	No sites eligible for the NRHP identified prior to Project surveys, existing cultural resources present	No sites eligible for the NRHP, existing cultural resources present	No sites eligible for the NRHP, existing cultural resources present	No sites eligible for the NRHP, existing cultural resources present	No sites eligible for the NRHP, existing cultural resources present	No sites eligible for the NRHP, existing cultural resources present
Is the site located directly adjacent to National or State Park units?	No[2]	No[2]	No[2]	No[2]	No[2]	No[2]

Note: Unless otherwise noted, analysis was limited to proposed or alternative site only.

Response to DR 132 Data Sources:
1 = NAIP 2005 aerial 1-meter resolution.
2 = County of San Bernardino:
- Urban areas (10-mile radius reviewed)
- National Parks

3 = PowerMap Platts data 2009 (all substations within a 10-mile radius)
4 = BLM:
- Designated Utility Corridor
- National Conservation Area
- Area of Critical Environmental Concern
- Acquired and Donated Lands
- National Monuments
- Wilderness Study Area
- California Desert Wilderness

5 = DOE Section 368 Utility Corridor
6 = USFWS:
- Critical Habitat Data
- West Mojave Boundary (HCP Data)

7 = CNDDB Sensitive Species Occurrence Oct 2009
8 = California Department of Water Resources
9 = National Wetlands Inventory
10 = ESRI roads data set (calculated to nearest existing road and rounded to ½ mile)
11 = The Applicant has experienced political resistance obtaining water from municipal sources, even when located proximate to the potential project site (please see the response to Data Request 71.
Note: Unless otherwise noted, analysis was limited to proposed or alternative site only.

Response to DR 132 Data Sources:
1 = NAIP 2005 aerial 1-meter resolution.
2 = County of San Bernardino:
- Urban areas (10-mile radius reviewed)
- National Parks

3 = PowerMap Platts data 2009 (all substations within a 10-mile radius)
4 = BLM:
- Designated Utility Corridor
- National Conservation Area
- Area of Critical Environmental Concern
- Acquired and Donated Lands
- National Monuments
- Wilderness Study Area
- California Desert Wilderness

5 = DOE Section 368 Utility Corridor
6 = USFWS:
- Critical Habitat Data
- West Mojave Boundary (HCP Data)

7 = CNDDB Sensitive Species Occurrence Oct 2009
8 = California Department of Water Resources
9 = National Wetlands Inventory
10 = ESRI roads data set (calculated to nearest existing road and rounded to ½ mile)
Unknown = Insufficient data available to make determination

TECHNICAL AREA: ALTERNATIVES

Data Request 133: Please prepare separate maps at a scale of 1:36,000 for each of the five alternative sites. For each site, an aerial or topographic map should have overlays of the site boundary, township ranges, and property parcels. Label roads and other features.

Response: Please see figures 133-1 thru 133-5 provided behind this response as attachment ALT-1.

ALT-1

Harrod Rd

Abelia St

Camp Rock Rd

WHITE HORSE MTN. QUAD

GRAND VIEW MINE QUAD

GRAND VIEW MINE QUAD

FRY MOUNTAINS QUAD

T06N R01E

T06N R02E

T05N R01E

T05N R02E

VALLEY

LUCERNE

NORTH

LEGEND

- Proposed Alternative Site
- Township/Range Boundary
- USGS 7.5' Quad

Surface Land Management Status

- Bureau of Land Management
- Private / Unclassified

SOURCES: ESRI (overview, roads);
BLM (ownership 2008, township/range 2009);
USGS 7.5' quads (Grand View Mine 1993).

CAMP ROCK ROAD
PROPOSED ALTERNATIVE SITE
SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3,000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-09-09	FIG. NO:
PM: WM	PROJ. NO: 27658189.40005	133-1

Path: G:\gis\projects\1577\27658100\mxd\Alternatives\DAR133_Camp_Rock_Rd.mxd 11/09/09 lisa_garvey

FRY MOUNTAINS QUAD

IRON RIDGE QUAD

T06N R03E

T06N R04E

T05N R03E

T05N R04E

Bessemer Mine Rd

JOHNSON VALLEY

UPPER

LEGEND

- Proposed Alternative Site
- Township/Range Boundary
- USGS 7.5' Quad

Surface Land Management Status

- Bureau of Land Management
- Private / Unclassified

SOURCES: ESRI (overview, roads);
BLM (ownership 2008, township/range 2009);
USGS 7.5' quads (Fry Mountains 1992, Iron Ridge 1982).

UPPER JOHNSON VALLEY PROPOSED ALTERNATIVE SITE SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3,000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-09-09	FIG. NO:
PM: WM	PROJ. NO: 27658189.40005	133-2

Path: G:\gis\projects\27727658189\mxd\Alternatives\DAR133_Upper_Johnson_Valley.mxd, 11/09/09, lisa_garvey

29 Palms Mcag

TWENTY-NINE PALMS MARINE CORPS BASE

IRON RIDGE QUAD

GALWAY LAKE QUAD

T06N R04E

T06N R05E

T05N R04E

T05N R05E

Argos Mountain

LEGEND

- Proposed Alternative Site
- Township/Range Boundary
- USGS 7.5' Quad

Surface Land Management Status

- Bureau of Land Management
- Department of Defense
- Private / Unclassified

SOURCES: ESRI (overview, roads);
BLM (ownership 2008, township/range 2009);
USGS 7.5' quads (Iron Ridge 1982, Galway Lake 1993).

WEST OF TWENTY-NINE PALMS PROPOSED ALTERNATIVE SITE SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3,000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-09-09	FIG. NO: 133-3
PM: WM	PROJ. NO: 27658189.40005	

Path: G:\gis\projects\1577\27658189\mxd\Alternatives\DAR133_West_of_29Palms.mxd, 11/09/09, lisa_garvey

Gasco Rd

Rancho Bj Rd

National Trails Hwy

TROY LAKE QUAD

HECTOR QUAD

SILVER BELL MINE QUAD

SUNSHINE PEAK QUAD

T08N R04E

T08N R05E

T07N R04E

T07N R05E

TWENTY-NINE PALMS MARINE CORPS BASE

29 Palms Mcag

29 Palms Mcag

LEGEND

- Proposed Alternative Site
- Township/Range Boundary
- USGS 7.5' Quad

Surface Land Management Status

- Bureau of Land Management
- Department of Defense
- Private / Unclassified

SOURCES: ESRI (overview, roads);
BLM (ownership 2008, township/range 2009);
USGS 7.5' quads (Troy Lake 1993, Silver Bell Mine 1993, Hector 1992, Sunshine Peak 1992).

I-40 SOUTH
PROPOSED ALTERNATIVE SITE
SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3,000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG | DATE: 11-09-09 | FIG. NO: 133-4

PM: WM | PROJ. NO: 27658189.40005

Path: G:\gis\projects\1577\27658189\mxd\Alternatives\DAR133_I40_South.mxd, 11/09/09, lisa_garvey

BROADWELL LAKE QUAD

SLEEPING BEAUTY QUAD

BROADWELL LAKE

T09N R06E
T09N R07E
T09N R08E
T08N R06E
T08N R07E
T08N R08E

Crucero Rd

MOUNTAINS

SLEEPING

BEAUTY

LEGEND

- Proposed Alternative Site
- Township/Range Boundary
- USGS 7.5' Quad

Surface Land Management Status

- Bureau of Land Management
- State Land
- Private / Unclassified

SOURCES: ESRI (overview, roads);
BLM (ownership 2008, township/range 2009);
USGS 7.5' quads (Sleeping Beauty 1993, Broadwell Lake 1993).

BROADWELL LAKE
PROPOSED ALTERNATIVE SITE
SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet
SCALE: 1" = 3,000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-09-09	FIG. NO:
PM: WM	PROJ. NO: 27658189.40005	133-5

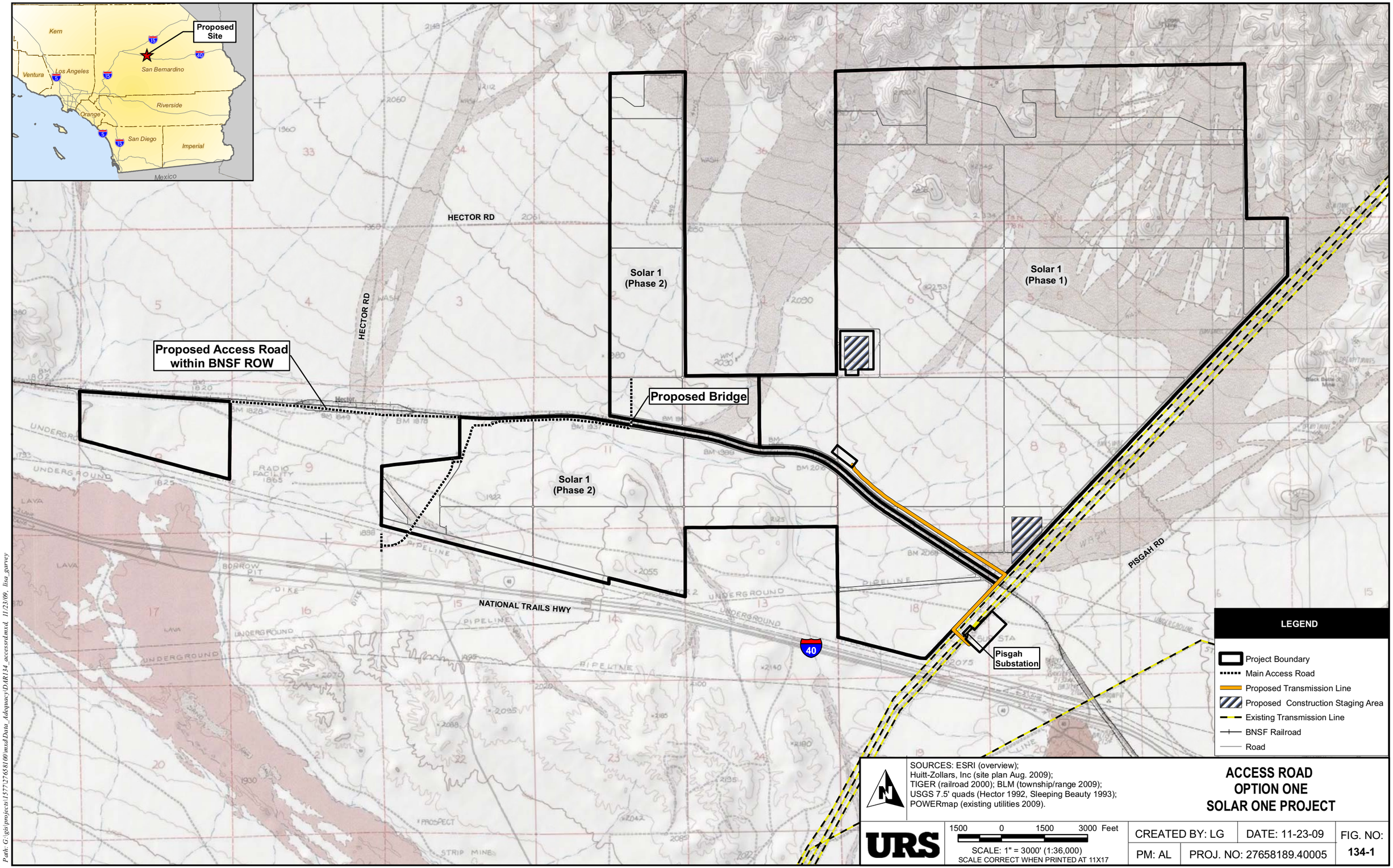
Path: G:\gis\projects\27\27658189\mxd\Alternatives\DARI33_Broadwell_Lake.mxd, 11/09/09, lisa_garvey

TECHNICAL AREA: ALTERNATIVES

Data Request 134: Please provide a map at a scale of 1:36,000 depicting all four of the alternative road access options.

Response: As the Project has moved through design phases and in an effort to reduce environmental impacts, the Applicant is no longer evaluating many of the alternative road access options. Options 2 through 4, as discussed in the AFC are no longer considered to be alternative road access options. A map showing this access option at the requested scale is provided behind this response as attachment ALT-2.

ALT-2



SOURCES: ESRI (overview);
Huitt-Zollars, Inc (site plan Aug. 2009);
TIGER (railroad 2000); BLM (township/range 2009);
USGS 7.5' quads (Hector 1992, Sleeping Beauty 1993);
POWERmap (existing utilities 2009).

ACCESS ROAD OPTION ONE SOLAR ONE PROJECT

URS

1500 0 1500 3000 Feet

SCALE: 1" = 3000' (1:36,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-23-09	FIG. NO: 134-1
PM: AL	PROJ. NO: 27658189.40005	

Path: G:\gis\projects\1577\27658100\mxd\Data_Adequacy\DAR134_accessrd.mxd, 11/23/09, lisa_garvey

TECHNICAL AREA: ALTERNATIVES

Data Request 135: Please provide an analysis of cultural and biological impacts for Phase 1 only and for Phase 2 only. Provide this by giving us both a map illustrating distribution of resources on each phase and also a tabular list of resources on each phase.

Response: Please note that while Phase 1 and Phase II are described in the following data responses, they are meant only to signify geographic phases of the Project. Through ongoing discussions with agencies and the public, the Applicant will determine the temporal phasing of Project build-out, which probably will not coincide with this current phase designation.

Biological Resources: Tables showing the resources in each phase of the Project are listed below. Figures are provided behind this response as attachment ALT-3.

Cultural Resources: Tables showing the resources in each phase of the Project and associated figures are provided in a separate filing, made under confidential cover.

Solar One Phase One - Sensitive Biological Resources

Common Name	Species Name	Description	Number
Wildlife			
American badger	*Taxidea taxus*	live American badger	1
Burrowing Owl	*Athene cunicularia*	live burrowing owl	1
Burrowing Owl	*Athene cunicularia*	active burrowing owl burrow	1
Desert Tortoise	*Gopherus agassizii*	live desert tortoise	18
Desert Tortoise	*Gopherus agassizii*	active tortoise burrow	9
Desert Tortoise	*Gopherus agassizii*	inactive tortoise burrow	40
Desert Tortoise	*Gopherus agassizii*	tortoise scat	8
Desert Tortoise	*Gopherus agassizii*	tortoise pallet	3
Desert Tortoise	*Gopherus agassizii*	tortoise carcass	9
Desert Tortoise	*Gopherus agassizii*	tortoise drinking pan	1
Plants			
Small-flowered Androstephium	*Androstephium breviflorum*	majority found in the southernmost quarter of Phase 1	16
Crucifixion Thorn	*Castela emoryi*	found in the northwest corner of Phase 1	1
White-margined Beardtongue	*Penstemon albomarginatus*	found in the southernmost quarter of Phase 1	1

Solar One Phase One – Vegetative Communities Impacted (acres)

Vegetation Community	Acres Impacted
Un-Vegetated Habitat	67.2
Mojave Creosote Bush Scrub	4,892.7
Developed	8.3
Total	**4,968.2**

Solar One Phase Two - Sensitive Biological Resources

Common Name	Species Name	Description	Number
Wildlife			
Desert Tortoise	*Gopherus agassizii*	live desert tortoise	3
Desert Tortoise	*Gopherus agassizii*	inactive tortoise burrow	5
Loggerhead Shrike	*Lanius ludovicianus*	live loggerhead shrike	1
Mojave Fringe-toed Lizard	*Uma scoparia*	live Mojave fringe-toed lizard	1
Mojave Fringe-toed Lizard	*Uma scoparia*	Suitable habitat	16.9 acres
Plants			
Small-flowered Androstephium	*Androstephium breviflorum*	found throughout Phase 2	26
Utah Vine Milkweed	*Cynanchum utahense*	found in the southwest corner of Phase 2	1
White-margined Beardtongue	*Penstemon albomarginatus*	all found near the southwest corner of Phase 2	12

Solar One Phase Two – Vegetative Communities Impacted (acres)

Vegetation Community	Acres Impacted
Mojave Creosote Bush Scrub	2712.6
Disturbed Mojave Creosote Bush Scrub	46.5
Desert Saltbush Scrub	241.7
Developed	20.2
Total	**3,021**

ALT-3

LEGEND

- Solar 1 Phase 1
- N.A.P. (Not a Part)
- BNSF Railroad

Vegetation Communities (Holland Code)

- Mojave Creosote Bush Scrub (34100)
- Un-Vegetated Habitat (13000)
- Developed (12000)

- American badger
- Burrowing owl
- Crucifixion thorn
- Small-flowered androstephium
- White-margined beardtongue
- Active Tortoise Burrow
- Inactive Tortoise Burrow
- Live Desert Tortoise
- Tortoise Carcass
- Tortoise Drinking Pan
- Tortoise Pallet
- Tortoise Scat

SOURCES:
Huitt-Zollars, Inc (site plan Aug. 2009);
TIGER (railroad 2000); ESRI (overview);
URS (sensitive species surveys 2007-2009, vegetation surveys 2007-2008);
NAIP (aerial 2005).

DISTRIBUTION OF SENSITIVE BIOLOGICAL RESOURCES SOLAR ONE PHASE 1

URS

1250 0 1250 2500 Feet

SCALE: 1" = 2500' (1:30,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-03-09	FIG. NO:
PM: WM	PROJ. NO: 27658189.40005	DR-135A

Path: G:\gis\projects\15772765810\mxd\BioDAR\bio_S1_bio_phase1.mxd, 11/04/09, lisa_garvey

LEGEND

- Solar 1 Phase 2
- N.A.P. (Not a Part)
- Potential Mojave Fringe-Toed Lizard Habitat
- BNSF Railroad

Vegetation Communities (Holland Code)

- Desert Saltbush Scrub, (36110)
- Mojave Creosote Bush Scrub (34100)
- Developed (12000)
- Disturbed Vegetation (Mapped As Overlay)

- Loggerhead shrike
- Mojave fringe-toed lizard
- Small-flowered androstephium
- Utah vine milkweed
- White-margined beardtongue
- Inactive Tortoise Burrow
- Live Desert Tortoise

SOURCES:
Huitt-Zollars, Inc (site plan Aug. 2009);
TIGER (railroad 2000); ESRI (overview);
URS (MFTL, sensitive species surveys 2007-2009, vegetation surveys 2007-2008);
NAIP (aerial 2005).

DISTRIBUTION OF SENSITIVE BIOLOGICAL RESOURCES SOLAR ONE PHASE 2

URS

1250 0 1250 2500 Feet

SCALE: 1" = 2500' (1:30,000)
SCALE CORRECT WHEN PRINTED AT 11X17

CREATED BY: LG	DATE: 11-03-09	FIG. NO:
PM: WM	PROJ. NO: 27658189.40005	DR-135B

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TECHNICAL AREA: ALTERNATIVES

Data Request 136: Please provide an air quality criteria pollutant and GHG emission estimates for the construction and operation of Phase 1 only and for Phase 2 only.

Response: The worst case construction and operational emissions for the 850 MW (Phase I & II together) project were calculated and addressed in the CEC's DR Set 1 responses, DR #7and 26 (docketed August 31, 2009). These emission estimates are used in calculating the emissions from Phase I and II, as described below.

Maximum construction emissions for the 500 MW (Phase I Only) option were calculated using reasonable equipment and personnel assumptions. The construction schedule is assumed to last 28 months. All construction activities related to the bridge construction are assumed to occur in both the Phase I and Phase II scenarios. Calculation details for the construction emissions are presented in Attachment ALT-4.

Calculation details for the estimation of Phase I only and Phase II only criteria pollutants and GHG operational emissions are presented in Attachment ALT-5. Please note that the addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total Project. This is due to several activities that would occur once in the total Project (i.e. building the bridge), but must also occur once in each phase were they to be developed exclusively.

Criteria pollutant and GHG emission estimates for the construction and operation of Phase 1 only and Phase 2 only are presented in the following tables.

Table DR-136a
Solar One (Phase I only)
Estimated Maximum Construction Emissions of Criteria Pollutants (tons)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	2.215	2.042	43.288	6.206	37.442	0.035
Worker Vehicles	0.122	0.093	8.571	0.590	0.799	0.012
Security Vehicles	0.001	0.001	0.263	0.007	0.004	0.001
Water Delivery Trucks	0.181	0.162	1.332	0.630	2.971	0.003
Bridge Construction Delivery Trucks	0.003	0.002	0.020	0.010	0.045	0.000
Other Delivery Trucks	0.377	0.338	3.004	1.184	6.160	0.007
Subtotal of On-site Combustion Emissions	**2.90**	**2.64**	**56.48**	**8.63**	**47.42**	**0.06**
On-Site Fugitive Dust Emissions						
Construction Equipment	4.06	0.83				
Storage piles	0.82	0.18				
Worker Vehicles	15.14	2.05				
Security Vehicles	1.33	0.18				
Water Delivery Trucks	29.55	4.42				
Bridge Construction Delivery Trucks	0.47	0.07				

Table DR-136a
Solar One (Phase I only)
Estimated Maximum Construction Emissions of Criteria Pollutants (tons)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
Other Delivery Trucks	66.38	9.54				
Subtotal of On-Site Fugitive Emissions	**117.74**	**17.28**				
Subtotal of On-Site Emissions	**120.64**	**19.91**	**56.48**	**8.63**	**47.42**	**0.06**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	1.01	0.76	70.47	4.85	6.57	0.10
Water Delivery Trucks	0.62	0.56	4.57	2.16	10.19	0.01
Bridge Construction Delivery Trucks	0.13	0.11	0.93	0.44	2.07	0.00
Other Delivery Trucks	6.76	6.07	49.85	23.56	111.18	0.12
Subtotal of Off-Site Combustion Emissions	**8.51**	**7.50**	**125.82**	**31.01**	**130.01**	**0.23**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	2.73	0.41				
Water Delivery Trucks	2.09	0.27				
Bridge Construction Delivery Trucks	0.44	0.06				
Other Delivery Trucks	23.77	3.05				
Subtotal of Off-Site Fugitive Emissions	**29.04**	**3.78**				
Subtotal of Off-Site Emissions	**37.55**	**11.28**	**125.82**	**31.01**	**130.01**	**0.23**
Total Maximum Emissions	**158.19**	**31.20**	**182.30**	**39.64**	**177.43**	**0.29**

Table DR-136b
Solar One (Phase I only)
Estimated Maximum Construction Greenhouse Gases Emissions
(metric tonnes)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Combustion Emissions				
Construction Equipment	3,342.01	1.22	-	3,367.72
Worker Vehicles	1,114.24	0.11	0.10	1,147.47
Security Vehicles	37.02	0.01	0.01	40.13
Water Delivery Trucks	306.22	0.00	0.00	306.37
Bridge Construction Delivery Trucks	4.66	0.00	0.00	4.66
Other Delivery Trucks	688.58	0.00	0.00	689.52
Subtotal of On-Site Emissions	**5,492.74**	**1.35**	**0.11**	**5,555.87**
Off-Site On-Road Emissions				
Worker Vehicles	9,161.51	0.89	0.82	9,434.73
Water Delivery Trucks	1,049.88	0.00	0.00	1,050.41
Bridge Construction Delivery Trucks	212.97	0.00	0.00	213.08
Other Delivery Trucks	11,457.78	0.02	0.02	11,463.55
Subtotal of Off-Site Emissions	**21,882.14**	**0.91**	**0.84**	**22,161.77**
Total Maximum Emissions	**27,374.87**	**2.26**	**0.95**	**27,717.64**

Table DR-136c
Solar One (Phase II only)
Estimated Maximum Construction Emissions of Criteria Pollutants (tons)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	1.068	0.984	21.318	3.049	17.954	0.017
Worker Vehicles	0.059	0.045	4.106	0.283	0.383	0.006
Security Vehicles	0.002	0.002	0.447	0.012	0.006	0.002
Water Delivery Trucks	0.084	0.075	0.619	0.292	1.380	0.001
Bridge Construction Delivery Trucks	0.003	0.002	0.020	0.010	0.045	0.000
Other Delivery Trucks	0.306	0.273	2.654	0.825	4.949	0.006
Subtotal of On-site Combustion Emissions	**1.52**	**1.38**	**29.16**	**4.47**	**24.72**	**0.03**
On-Site Fugitive Dust Emissions						
Construction Equipment	2.082	0.449				
Storage piles	0.819	0.182				
Worker Vehicles	7.252	0.982				
Security Vehicles	2.271	0.313				
Water Delivery Trucks	13.719	2.052				
Bridge Construction Delivery Trucks	0.471	0.069				
Other Delivery Trucks	55.751	7.698				
Subtotal of On-Site Fugitive Emissions	**82.36**	**11.75**				
Subtotal of On-Site Emissions	**83.88**	**13.13**	**29.16**	**4.47**	**24.72**	**0.03**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.48	0.37	33.76	2.32	3.15	0.05
Water Delivery Trucks	0.29	0.26	2.12	1.00	4.73	0.01
Bridge Construction Delivery Trucks	0.13	0.11	0.93	0.44	2.07	0.00
Other Delivery Trucks	3.16	2.83	23.27	11.00	51.91	0.06
Subtotal of Off-Site Combustion Emissions	**4.05**	**3.57**	**60.08**	**14.76**	**61.85**	**0.11**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.31	0.20				
Water Delivery Trucks	0.97	0.12				
Bridge Construction Delivery Trucks	0.44	0.06				
Other Delivery Trucks	11.10	1.42				
Subtotal of Off-Site Fugitive Emissions	**13.82**	**1.80**				
Subtotal of Off-Site Emissions	**17.87**	**5.37**	**60.08**	**14.76**	**61.85**	**0.11**
Total Maximum Emissions	**101.75**	**18.50**	**89.25**	**19.23**	**86.57**	**0.14**

Table DR-136d
Solar One (Phase II only)
Estimated Maximum Construction Greenhouse Gases Emissions
(metric tonnes)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	1,607.77	0.61	-	1,620.48
Worker Vehicles	533.82	0.05	0.05	549.74
Security Vehicles	63.06	0.02	0.02	68.35
Water Delivery Trucks	142.17	0.00	0.00	142.24
Bridge Construction Delivery Trucks	4.66	0.00	0.00	4.66
Other Delivery Trucks	607.60	0.00	0.00	608.96
Subtotal of On-site Combustion Emissions	**2,959.09**	**0.68**	**0.07**	**2,994.44**
Off-Site On-Road Emissions				
Worker Vehicles	4,389.20	0.43	0.39	4,520.09
Water Delivery Trucks	487.45	0.00	0.00	487.69
Bridge Construction Delivery Trucks	212.97	0.00	0.00	213.08
Other Delivery Trucks	5,348.91	0.01	0.01	5,351.61
Subtotal of Off-Site Emissions	**10,438.53**	**0.44**	**0.40**	**10,572.47**
Total Maximum Emissions	**13,397.61**	**1.12**	**0.47**	**13,566.91**

Table DR-136e
Solar One (Phase I Only)
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.0001	0.0001	0.0006	0.0002	0.0068	0.0002
Maintenance & Security Vehicles and Equipment	0.03	0.03	23.65	3.39	1.48	0.01
Worker Vehicles	0.01	0.01	0.63	0.04	0.06	0.00
Visitor Cars and Delivery Trucks	0.01	0.00	0.08	0.02	0.08	0.00
Subtotal of On-site Combustion Emissions	**0.05**	**0.04**	**24.36**	**3.45**	**1.63**	**0.01**
On-Site Fugitive Emissions						
Maintenance & Security Vehicles and Equipment	15.05	2.23				
Worker Vehicles	1.91	0.26				
Visitor Cars and Delivery Trucks	1.45	0.20				
Gasoline Tank				1.00		
Subtotal of On-Site Fugitive Emissions	**18.42**	**2.69**	**0.00**	**1.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**18.46**	**2.73**	**24.36**	**4.45**	**1.63**	**0.01**

Table DR-136e
Solar One (Phase I Only)
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.07	0.04	3.44	0.09	0.40	0.01
Visitor Cars and Delivery Trucks	0.02	0.02	0.31	0.03	0.43	0.00
Subtotal of Off-Site Combustion Emissions	**0.09**	**0.05**	**3.74**	**0.12**	**0.83**	**0.01**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	2.33	0.06				
Visitor Cars and Delivery Trucks	1.75	0.24				
Subtotal of Off-Site Fugitive Emissions	**4.08**	**0.30**				
Subtotal of Off-Site Emissions	**4.17**	**0.36**	**3.74**	**0.12**	**0.83**	**0.01**
Total Maximum Emissions	**22.63**	**3.08**	**28.10**	**4.57**	**2.45**	**0.02**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case

Table DR-136f
Solar One (Phase I Only)
Estimated Annual Maximum Operational Greenhouse Gases Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
On-Site Operational Emissions					
On-Site Combustion Emissions					
Diesel Generator	0.81	0.00	0.00	0.00	0.82
Maintenance & Security Vehicles and Equipment	965.31	0.27	0.06	0.00	988.73
Worker Vehicles	138.42	0.01	0.01	0.00	142.35
Visitor Cars and Delivery Trucks	20.86	0.00	0.00	0.00	21.11
Potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment				0.02	384.42
Subtotal of On-Site Emissions	**1,125.40**	**0.28**	**0.07**	**0.02**	**1,537.42**
Off-Site On-Road Emissions					
Off-Site Combustion Emissions					
Worker Vehicles	594.02	0.14	0.12	0.00	635.57
Visitor Cars and Delivery Trucks	102.84	0.01	0.01	0.00	105.43
Subtotal of Off-Site Emissions	**696.86**	**0.14**	**0.13**	0.00	**741.00**
Total Maximum Emissions	**1,822.26**	**0.43**	**0.20**	**0.02**	**2,278.42**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

Table DR-136g
Solar One (Phase II Only)
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.0001	0.0001	0.0006	0.0002	0.0068	0.0002
Maintenance & Security Vehicles and Equipment	0.0178	0.0162	2.7237	0.0247	0.7589	0.0021
Worker Vehicles	0.0098	0.0074	0.4209	0.0257	0.0385	0.0010
Visitor Cars and Delivery Trucks	0.0031	0.0027	0.0481	0.0124	0.0509	0.0001
Subtotal of On-site Combustion Emissions	**0.03**	**0.03**	**3.19**	**0.06**	**0.86**	**0.00**
On-Site Fugitive Emissions						
Maintenance & Security Vehicles and Equipment	13.15	1.95				
Worker Vehicles	1.28	0.17				
Visitor Cars and Delivery Trucks	0.81	0.12				
Gasoline Tank				0.78		
Subtotal of On-Site Fugitive Emissions	**15.23**	**2.24**	**0.00**	**0.78**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**15.26**	**2.27**	**3.19**	**0.84**	**0.86**	**0.00**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.05	0.03	2.29	0.06	0.26	0.005
Visitor Cars and Delivery Trucks	0.01	0.00	0.16	0.01	0.10	0.000
Subtotal of Off-Site Combustion Emissions	**0.05**	**0.03**	**2.45**	**0.07**	**0.36**	**0.00**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.55	0.04				
Visitor Cars and Delivery Trucks	0.42	0.05				
Subtotal of Off-Site Fugitive Emissions	**1.98**	**0.09**				
Subtotal of Off-Site Emissions	**2.03**	**0.12**	**2.45**	**0.07**	**0.36**	**0.00**
Total Maximum Emissions	**17.30**	**2.39**	**5.64**	**0.91**	**1.22**	**0.01**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

Table DR-136h
Solar One (Phase II Only)
Estimated Annual Maximum Operational Greenhouse Gases Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
On-Site Operational Emissions					
On-Site Combustion Emissions					
Diesel Generator	0.81	0.00	0.00	-	0.82
Maintenance & Security Vehicles and Equipment	311.60	0.15	0.02	-	321.63
Worker Vehicles	92.28	0.01	0.01	-	94.90
Visitor Cars and Delivery Trucks	13.23	0.00	0.00	-	13.40

Table DR-136h
Solar One (Phase II Only)
Estimated Annual Maximum Operational Greenhouse Gases Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
Potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment				-	-
Subtotal of On-Site Emissions	**417.92**	**0.16**	**0.03**	**-**	**430.74**
Off-Site On-Road Emissions					
Off-Site Combustion Emissions					
Worker Vehicles	396.01	0.09	0.08	-	423.71
Visitor Cars and Delivery Trucks	37.01	0.01	0.01	-	38.70
Subtotal of Off-Site Emissions	**433.02**	**0.10**	**0.09**	**-**	**462.41**
Total Maximum Emissions	**850.94**	**0.25**	**0.12**	**-**	**893.15**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

ALT-4

Attachment ALT-4
Construction Emissions
(Nov. 20, 2009)

Table DR-136a
Solar One (Phase I only)
Estimated Maximum Construction Emissions of Criteria Pollutants (tons)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	2.215	2.042	43.288	6.206	37.442	0.035
Worker Vehicles	0.122	0.093	8.571	0.590	0.799	0.012
Security Vehicles	0.001	0.001	0.263	0.007	0.004	0.001
Water Delivery Trucks	0.181	0.162	1.332	0.630	2.971	0.003
Bridge Construction Delivery Trucks	0.003	0.002	0.020	0.010	0.045	0.000
Other Delivery Trucks	0.377	0.338	3.004	1.184	6.160	0.007
Subtotal of On-site Combustion Emissions	**2.90**	**2.64**	**56.48**	**8.63**	**47.42**	**0.06**
On-Site Fugitive Dust Emissions						
Construction Equipment	4.06	0.83				
Storage piles	0.82	0.18				
Worker Vehicles	15.14	2.05				
Security Vehicles	1.33	0.18				
Water Delivery Trucks	29.55	4.42				
Bridge Construction Delivery Trucks	0.47	0.07				
Other Delivery Trucks	66.38	9.54				
Subtotal of On-Site Fugitive Emissions	**117.74**	**17.28**				
Subtotal of On-Site Emissions	**120.64**	**19.91**	**56.48**	**8.63**	**47.42**	**0.06**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	1.01	0.76	70.47	4.85	6.57	0.10
Water Delivery Trucks	0.62	0.56	4.57	2.16	10.19	0.01
Bridge Construction Delivery Trucks	0.13	0.11	0.93	0.44	2.07	0.00
Other Delivery Trucks	6.76	6.07	49.85	23.56	111.18	0.12
Subtotal of Off-Site Combustion Emissions	**8.51**	**7.50**	**125.82**	**31.01**	**130.01**	**0.23**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	2.73	0.41				
Water Delivery Trucks	2.09	0.27				
Bridge Construction Delivery Trucks	0.44	0.06				
Other Delivery Trucks	23.77	3.05				
Subtotal of Off-Site Fugitive Emissions	**29.04**	**3.78**				
Subtotal of Off-Site Emissions	**37.55**	**11.28**	**125.82**	**31.01**	**130.01**	**0.23**
Total Maximum Emissions	**158.19**	**31.20**	**182.30**	**39.64**	**177.43**	**0.29**

Table DR-136b

Solar One (Phase I only)

Estimated Maximum Construction Greenhouse Gases Emissions

(metric tonnes)

Activity	CO_2	CH_4	N_2O	CO_2e
On-Site Combustion Emissions				
Construction Equipment	3,342.01	1.22	-	3,367.72
Worker Vehicles	1,114.24	0.11	0.10	1,147.47
Security Vehicles	37.02	0.01	0.01	40.13
Water Delivery Trucks	306.22	0.00	0.00	306.37
Bridge Construction Delivery Trucks	4.66	0.00	0.00	4.66
Other Delivery Trucks	688.58	0.00	0.00	689.52
Subtotal of On-Site Emissions	**5,492.74**	**1.35**	**0.11**	**5,555.87**
Off-Site On-Road Emissions				
Worker Vehicles	9,161.51	0.89	0.82	9,434.73
Water Delivery Trucks	1,049.88	0.00	0.00	1,050.41
Bridge Construction Delivery Trucks	212.97	0.00	0.00	213.08
Other Delivery Trucks	11,457.78	0.02	0.02	11,463.55
Subtotal of Off-Site Emissions	**21,882.14**	**0.91**	**0.84**	**22,161.77**
Total Maximum Emissions	**27,374.87**	**2.26**	**0.95**	**27,717.64**

Table DR-136c

Solar One (Phase II only)
Estimated Maximum Construction Emissions of Criteria Pollutants (tons)

Activity	PM10	PM2.5	CO	ROG	NOx	SOx
On-Site Construction Emissions						
On-Site Combustion Emissions						
Construction Equipment	1.068	0.984	21.318	3.049	17.954	0.017
Worker Vehicles	0.059	0.045	4.106	0.283	0.383	0.006
Security Vehicles	0.002	0.002	0.447	0.012	0.006	0.002
Water Delivery Trucks	0.084	0.075	0.619	0.292	1.380	0.001
Bridge Construction Delivery Trucks	0.000	0.000	0.000	0.000	0.000	0.000
Other Delivery Trucks	0.306	0.273	2.654	0.825	4.949	0.006
Subtotal of On-site Combustion Emissions	**1.52**	**1.38**	**29.14**	**4.46**	**24.67**	**0.03**
On-Site Fugitive Dust Emissions						
Construction Equipment	2.082	0.449				
Storage piles	0.819	0.182				
Worker Vehicles	7.252	0.982				
Security Vehicles	2.271	0.313				
Water Delivery Trucks	13.719	2.052				
Bridge Construction Delivery Trucks	0.000	0.000				
Other Delivery Trucks	55.751	7.698				
Subtotal of On-Site Fugitive Emissions	**81.89**	**11.68**				
Subtotal of On-Site Emissions	**83.41**	**13.06**	**29.14**	**4.46**	**24.67**	**0.03**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.48	0.37	33.76	2.32	3.15	0.05
Water Delivery Trucks	0.29	0.26	2.12	1.00	4.73	0.01
Bridge Construction Delivery Trucks	0.00	0.00	0.00	0.00	0.00	0.00
Other Delivery Trucks	3.16	2.83	23.27	11.00	51.91	0.06
Subtotal of Off-Site Combustion Emissions	**3.93**	**3.46**	**59.16**	**14.33**	**59.78**	**0.11**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.31	0.20				
Water Delivery Trucks	0.97	0.12				
Bridge Construction Delivery Trucks	0.00	0.00				
Other Delivery Trucks	11.10	1.42				
Subtotal of Off-Site Fugitive Emissions	**13.38**	**1.74**				
Subtotal of Off-Site Emissions	**17.30**	**5.20**	**59.16**	**14.33**	**59.78**	**0.11**
Total Maximum Emissions	**100.71**	**18.26**	**88.30**	**18.79**	**84.46**	**0.14**

Table DR-136d
Solar One (Phase II only)
Estimated Maximum Construction Greenhouse Gases Emissions

Activity	CO2	CH4	N2O	CO2e
On-Site Construction Emissions				
On-Site Combustion Emissions				
Construction Equipment	1,607.77	0.61	-	1,620.48
Worker Vehicles	533.82	0.05	0.05	549.74
Security Vehicles	63.06	0.02	0.02	68.35
Water Delivery Trucks	142.17	0.00	0.00	142.24
Bridge Construction Delivery Trucks	-	-	-	-
Other Delivery Trucks	607.60	0.00	0.00	608.96
Subtotal of On-site Combustion Emissions	**2,954.42**	**0.68**	**0.07**	**2,989.78**
Off-Site On-Road Emissions				
Worker Vehicles	4,389.20	0.43	0.39	4,520.09
Water Delivery Trucks	487.45	0.00	0.00	487.69
Bridge Construction Delivery Trucks	-	-	-	-
Other Delivery Trucks	5,348.91	0.01	0.01	5,351.61
Subtotal of Off-Site Emissions	**10,225.56**	**0.44**	**0.40**	**10,359.39**
Total Maximum Emissions	**13,179.98**	**1.12**	**0.47**	**13,349.17**

Solar One (Phase I Only)

Phase I Construction Construction Personnel Projection (500 MW)

	Month After Construction Start																												
Discipline	**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**	**Highest Per Day Requirement by Solar One During Project**
Carpenters	10	14	31	31	47	40	28	28	21	11	10	10	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	47
Concrete Crews	9	15	29	29	29	46	46	24	21	11	10	10	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	46
Electricians	17	28	57	57	84	60	54	54	69	69	105	105	48	48	44	44	44	44	44	44	44	44	44	44	0	0	0	0	105
Ironworkers	19	23	41	41	48	36	24	24	36	26	25	25	10	10	10	10	10	10	0	0	0	0	0	0	0	0	0	0	48
Laborers	17	43	65	62	62	142	142	30	56	41	46	46	22	17	17	17	17	17	10	10	10	10	10	10	0	0	0	0	142
Miscellaneous Crews	0	0	0	0	10	10	10	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Operators	25	82	75	75	86	72	51	51	84	88	61	52	34	27	25	25	25	25	2	2	2	2	2	2	1	1	0	0	88
Plumbers	0	5	9	9	26	26	14	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
Solar One Technicians	0	0	0	0	16	16	16	16	16	16	16	16	16	16	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
SunCatcher Assemblers	0	0	0	0	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64
SunCatcher Electricians	0	0	0	0	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
SunCatcher Ironworkers	0	0	0	0	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
SunCatcher Laborers	0	0	0	0	16	16	16	16	16	16	16	16	16	16	0	0	0	0	0	0	0	0	16	16	16	16	16	16	16
SunCatcher Material Handlers	0	0	0	0	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
SunCatcher Operators	0	0	0	0	8	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0	0	8	8	8	8	8	8	8
SunCatcher Teamsters	0	0	0	0	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0	0	0	0	12	12	12	12	12	12	12
SunCatcher Technicians	0	0	0	0	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
Teamsters	4	60	49	24	24	25	25	5	31	53	28	26	24	4	3	3	3	3	1	1	1	1	1	1	1	1	0	0	60
Technicians	0	0	0	0	5	5	5	5	5	1	1	1	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	5
Totals	**101**	**270**	**356**	**328**	**633**	**674**	**611**	**457**	**535**	**512**	**498**	**487**	**370**	**339**	**312**	**312**	**312**	**312**	**249**	**249**	**249**	**249**	**285**	**285**	**230**	**230**	**228**	**228**	**674**

Source: Bureau of Labor Statistics, 2008.

Note:

1. N/A = not applicable
2. Since the ratio of the total acres for Phase I site and for Phase II site is about 2 to 1, the construction personnel and equipment projections in month 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39 on CEC's Data Request Set 1 Attachment AQ-1 Tables are taken out and the remainders are assumed to represent the required construction resources for Phase I Only (500 MW) scenario.
3. The numbers of certain personnel and equipment projections for the bridge construction remain the same from month 1 to 7 since the bridge construction work will be the at the same time in any case. These specific personnel and equipment include "Concrete Crews", "Laborers", "Teamsters", "Concrete Delivery Truck for bridge", "Concrete Pump Truck for bridge", and "General Materials Delivery Truck for bridge".
4. Phase I construction length is assumed to be 28 months
5. Original Data from Appendix V Solar 1
6. The table does not match Solar 1 Table 3-15 from AFC

Solar One (Phase I Only)
Phase I Construction Equipment Projection (500 MW)
Table

Construction Equipment Description	HP	D	G	P	Month After Construction Start (number of equipment per day)																											
					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
Air Compressor	50	X			1	1	1	3	3	3	2	2	2	2	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Asphalt Paver	120	X			0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Backhoe	120	X			3	9	6	6	6	6	4	4	4	4	4	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Compactor	120	X			2	4	4	4	4	3	3	3	3	3	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Crane small	175	X			1	3	6	6	8	8	8	7	7	9	7	6	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4
Crane large	500	X			1	1	4	4	4	1	0	0	0	0	0	0	0	0	3	3	3	0	0	0	0	0	0	0	0	0	0	0
Dozer	250	X			1	1	1	1	1	1	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Generator	50	X			1	1	2	2	5	5	7	7	7	3	3	3	2	2	2	2	1	1	0	0	0	0	0	0	0	0	0	0
Grader	175	X			2	4	4	4	3	2	1	0	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Light Tower	50	X			0	0	1	2	2	2	2	2	2	2	2	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Loader	250	X			2	4	6	6	4	3	2	1	1	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Maxi Sneeker (Trencher)	50	X			0	2	2	2	5	5	5	5	5	5	5	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Skid Steer (Bobcat)	50	X			0	1	2	2	3	3	2	2	2	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Welding Machine	50	X			0	1	3	5	5	5	5	5	3	3	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Equipment fueled with Propane																																
Aerial Lift	120			X	2	6	6	6	6	6	3	2	2	5	6	6	2	2	2	2	2	2	2	2	2	2	2	6	6	6	6	6
Fork Lift	50			X	2	6	8	8	8	8	8	8	8	8	7	7	7	7	6	6	6	6	6	6	6	0	0	0	0	0	0	0
Telehandler	120			X	0	0	1	2	5	5	3	3	3	5	6	5	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Vehicles with Onroad Engines for Emissions Estimates																																
Concrete Delivery Truck for general construction	250	X			2	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Delivery Truck for bridge	250	X			1	1	1	1	1	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Concrete Pump Truck for bridge	250	X			1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dump Truck	250	X			3	8	7	5	5	5	0	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Flatbed Truck	250	X			2	10	10	10	10	10	10	10	10	10	10	10	8	8	7	7	7	7	7	7	7	7	7	2	2	2	2	2
Staff & Security Truck	187	/			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Pickup Truck	175		X		11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Water/Soiltac Truck	250	X			5	14	8	7	5	5	5	5	5	5	5	5	5	5	5	3	3	3	3	1	1	1	1	1	1	1	1	1
General Materials Delivery Truck for general construction	250	X			0	3	3	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
General Materials Delivery Truck for bridge	250	X			2	2	2	2	2	12	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Suncatcher Pedestals Delivery Truck	250	X			0	0	3	3	3	1	0	0	0	0	0	0	0	0	3	3	3	0	0	0	0	0	0	0	0	0	0	0
Stirling Engines Delivery Truck	250	X			6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
Suncatcher Metal Supports Delivery Truck	250	X			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
Suncatcher Mirrors Delivery Truck	250	X			7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
Electrical and Control Systems Delivery Truck	250	X			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Azimuth and Elevation Drive Delivery Truck	250	X			2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Water Delivery Trucks	450	X			19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Worker Passenger Vehicles	100	/			67	180	237	219	422	449	407	305	357	341	332	325	247	226	208	208	208	208	166	166	166	166	190	190	153	153	152	152
Total					165	334	393	378	588	621	546	435	485	482	469	456	349	327	309	306	305	298	255	253	253	247	271	275	233	233	232	232

Note:

1. abbreviation:
   HP=horsepower
   G=gasoline
   D=diesel
   P=propane
2. max numbers of equipment and vehicles per month = 621
3. It is assumed the numbers of worker passenger vehicles are the numbers of workers divided by 1.5.
4. Since the ratio of the total acres for Phase I site and for Phase II site is about 2 to 1, the construction personnel and equipment projections in month 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39 on CEC's Data Request Set 1 Attachment AQ-1 Tables are taken out and the rema
5. The numbers of certain personnel and equipment projections for the bridge construction remain the same from month 1 to 7 since the bridge construction work will be the at the same time in any case. These specific personnel and equipment include "Concrete Crews", "Laborer

Solar One (Phase I Only)

Description	Activity	Make / Model	Fuel	Quantity per month	Frequency	Horse-power	Vehicle Weight (tons)	Max Daily Onsite Distance per Vehicle (mile/day)	Assumed distance percentage to drive on onsite sealed roads	Assumed distance percentage to drive on onsite unpaved roads	Assumed distance percentage to drive on onsite paved roads	Max Daily Offsite Round-trip Distance per Vehicle within MDAQMD jurisdictional area (mile/day)	Offsite Travel to and from	Onsite Travel description
Concrete Delivery Truck for general construction			Diesel	variable - from construction equipment schedule	Daily	250	20	7	90%	10%	0%	74	Barstow	most concrete will be delivered to the MSC area
Concrete Delivery Truck for bridge			Diesel	variable - from construction equipment schedule	Daily	250	20	1.6	90%	10%	0%	74	Barstow	most concrete will be delivered to the bridge construction area
Concrete Pump Truck for bridge			Diesel	variable - from construction equipment schedule	Daily	250	20	0.1	90%	10%	0%	0	on-site only	concrete pump will be used mostly in the MSC area
Dump Truck			Diesel	variable - from construction equipment schedule	Daily	250	20	3.6	50%	50%	0%	0	on-site only	from the MSC area to the any construction area of the site
Flatbed Truck			Diesel	variable - from construction equipment schedule	Daily	250	10	14.4	100%	0%	0%	0	on-site only	delivers materials to installation location
Staff & Security Truck	Site Inspections & Security	Toyota Highlander or similar	Gasoline - Hybrid	6	Daily	187	2.25	26	100%	0%	0%	0	on-site only	travels mainly perimeter and main access road
Pickup Truck			Gasoline	variable - from construction equipment schedule	Daily	175	4	3.6	95%	5%	0%	0	on-site only	from the MSC area to the any construction area of the site
Water/Soiltac Truck			Diesel	variable - from construction equipment schedule	Daily	250	20	7.2	25%	75%	0%	0	on-site only	from the MSC area to the any construction area of the site
General Materials Delivery Truck for general construction	General Construction Materials	transport truck	Diesel	variable - from construction equipment schedule	Daily	250	20	7	100%	0%	0%	74	Barstow	most materials will be delivered to the MSC area
General Materials Delivery Truck for bridge	General Construction Materials	transport truck	Diesel	variable - from construction equipment schedule	Daily	250	20	1.6	100%	0%	0%	74	Barstow	most materials will be delivered to the bridge construction area
Suncatcher Delivery Trucks	Suncatcher Pedestals	transport truck	Diesel	variable - from construction equipment schedule	Daily	250	20	7	50%	50%	0%	200	Phoenix	delivers pedestals to installation location
	Stirling Engines	transport truck	Diesel	6	Daily	250	20	7	100%	0%	0%	160	railroad from Detroit to LA and then tranported by truck	delivers materials to MSC
	Suncatcher Metal Supports	transport truck	Diesel	11	Daily	250	20	7	100%	0%	0%	180	from near Phoenix or Los Angeles area.	delivers materials to MSC
	Suncatcher Mirrors	transport truck	Diesel	7	Daily	250	20	7	100%	0%	0%	160	railroad from Detroit to LA and then tranported by truck	delivers materials to MSC
	Electrical and Control Systems	transport truck	Diesel	2	Daily	250	20	7	100%	0%	0%	200	Phoenix	delivers materials to MSC
	Azimuth and Elevation Drive	transport truck	Diesel	2	Daily	250	20	7	100%	0%	0%	160	railroad from Midwest to LA and then tranported by truck	delivers materials to MSC
Water Delivery Trucks	All onsite water will be delivered by truck	7500 gal truck	Diesel	19	Daily	450	19.5	7	100%	0%	0%	24	Newberry Springs	delivers water to tanks in MSC
Worker Passenger Vehicles	Community to Work	Passenger vehicles	Gasoline & diesel	variable - from construction equipment schedule	Daily	100	2	9	100%	0%	0%	74	Barstow	half to MSC and the other half to the main laydown area

Note:

1. Vehicles with variable quantities, the quantity per month can be found in Table 5.2-19 Revised Construction Equipment Projection
2. The average distance from the Project site entrance to bridge construction area, MSC, and the main laydown area is about 0.8, 3.5, and 5.5 miles, one-way, respectively.
3. The average distance between the MSC and the main laydown area is about 2 miles.
4. The fenceline perimeter for Phase I site is approximately 20 miles. Each security vehicle is assumed to travel from the MSC around the perimeter plus one trip to the center of north fenced property (1.8 miles) and back (and plus additional 10% for misc trips) = approximately 26 miles.
5. Average distance from main service complex to center of north portion of the site (Phase I) is 1.8 miles. Thus, the average round trip distance for each dump truck, pickup truck, and concrete pump truck travels is 3.6 [=1.8 *2] miles.
6. Distance for water delivery truck travels was provided by the applicant (12 miles one way trip from Newberry Springs to Project site entrance).
7. The distance from the Project site to Barstow is about 37 miles.
8. Deliveries coming from Detroit will travel by rail to Los Angeles then by transport truck to the site.
9. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward Los Angeles is about 80 miles.
10. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward Phoenix is about 100 miles.
11. On-site travelling:

    Delivery Trucks: mostly from the Project site entrance to the MSC (3.5 miles).

    Worker Passenger Vehicles: from the Project site entrance to either the laydown area in the MSC (3.5 miles) or the main laydown area (5.5 miles).

    Concrete Pump Trucks: mostly in the bridge construction area (traveling less than 0.1 miles per day).

    Flatbed Truck: assumed to make 4 trips per day to SunCatcher installation locations delivering assembled dishes and misc parts

    Water/Soiltac Truck: assumed to make 2 trips per day to SunCatcher instalation locations to watering or seaing the soiltac product.

    Construction laydown area is sealed

Solar One (Phase I Only)
Combustion Exhaust Emissions On-site (short-term)
Highest activity and emissions occur in month 5.

construction schedule = 12 hours per day 7 am to 7 pm pedestal installation = 16 hours per day
delivery trucks can arrive at the site anytime during the day or night

EMISSION FACTORS

Equipment	Load Factor	Hours/Day	Horsepower	Emission factors (ton/hr) PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e	Emission rate per piece of equipment (lb/hr) PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Diesel Construction Equipment																							
Air Compressor	0.48	6	50	1.33E-05	1.23E-05	1.42E-04	5.88E-05	1.20E-04	1.44E-07	1.11E-02	5.31E-06	0.00E+00	1.12E-02	2.67E-02	2.46E-02	2.83E-01	1.18E-01	2.39E-01	2.88E-04	2.23E+01	1.06E-02	0.00E+00	2.25E+01
Asphalt Paver	0.59	7	120	4.26E-05	3.92E-05	2.61E-04	8.18E-05	4.84E-04	4.05E-07	3.46E-02	7.38E-06	0.00E+00	3.47E-02	8.52E-02	7.84E-02	5.22E-01	1.64E-01	9.68E-01	8.11E-04	6.91E+01	1.48E-02	0.00E+00	6.94E+01
Backhoe	0.47	6	120	2.57E-05	2.37E-05	1.81E-04	4.54E-05	2.83E-04	3.03E-07	2.58E-02	4.10E-06	0.00E+00	2.59E-02	5.14E-02	4.73E-02	3.62E-01	9.08E-02	5.66E-01	6.06E-04	5.17E+01	8.19E-03	0.00E+00	5.19E+01
Compactor	0.47	6	120	3.20E-05	2.95E-05	2.09E-04	6.00E-05	3.69E-04	3.46E-07	2.95E-02	5.41E-06	0.00E+00	2.96E-02	6.41E-02	5.89E-02	4.17E-01	1.20E-01	7.38E-01	6.91E-04	5.89E+01	1.08E-02	0.00E+00	5.92E+01
Crane small	0.43	5	175	2.69E-05	2.47E-05	2.44E-04	6.05E-05	4.65E-04	4.52E-07	4.01E-02	5.46E-06	0.00E+00	4.03E-02	5.38E-02	4.95E-02	4.88E-01	1.21E-01	9.29E-01	9.03E-04	8.03E+01	1.09E-02	0.00E+00	8.05E+01
Crane large	0.43	7	500	3.42E-05	3.15E-05	3.31E-04	9.10E-05	8.85E-04	8.83E-07	9.00E-02	8.21E-06	0.00E+00	9.01E-02	6.85E-02	6.30E-02	6.62E-01	1.82E-01	1.77E+00	1.77E-03	1.80E+02	1.64E-02	0.00E+00	1.80E+02
Dozer	0.59	7	250	3.92E-05	3.61E-05	2.87E-04	1.03E-04	9.71E-04	9.34E-07	8.30E-02	9.25E-06	0.00E+00	8.32E-02	7.84E-02	7.21E-02	5.74E-01	2.05E-01	1.94E+00	1.87E-03	1.66E+02	1.85E-02	0.00E+00	1.66E+02
Generator	0.74	9	50	1.43E-05	1.32E-05	1.46E-04	5.65E-05	1.54E-04	1.98E-07	1.53E-02	5.10E-06	0.00E+00	1.54E-02	2.86E-02	2.63E-02	2.92E-01	1.13E-01	3.07E-01	3.96E-04	3.06E+01	1.02E-02	0.00E+00	3.08E+01
Grader	0.58	7	175	3.91E-05	3.60E-05	3.70E-04	8.70E-05	6.76E-04	6.97E-07	6.19E-02	7.85E-06	0.00E+00	6.21E-02	7.82E-02	7.19E-02	7.40E-01	1.74E-01	1.35E+00	1.39E-03	1.24E+02	1.57E-02	0.00E+00	1.24E+02
Light Tower	0.62	7	50	1.31E-05	1.21E-05	1.46E-04	5.16E-05	1.39E-04	1.81E-07	1.40E-02	4.66E-06	0.00E+00	1.41E-02	2.63E-02	2.42E-02	2.93E-01	1.03E-01	2.78E-01	3.62E-04	2.80E+01	9.31E-03	0.00E+00	2.82E+01
Loader	0.54	6	250	2.81E-05	2.59E-05	2.10E-04	7.46E-05	7.67E-04	8.37E-07	7.44E-02	6.73E-06	0.00E+00	7.46E-02	5.63E-02	5.18E-02	4.21E-01	1.49E-01	1.53E+00	1.67E-03	1.49E+02	1.35E-02	0.00E+00	1.49E+02
Maxi Sneeker (Trencher)	0.70	8	50	2.02E-05	1.86E-05	2.18E-04	9.18E-05	1.81E-04	2.13E-07	1.64E-02	8.28E-06	0.00E+00	1.66E-02	4.05E-02	3.72E-02	4.36E-01	1.84E-01	3.62E-01	4.25E-04	3.29E+01	1.66E-02	0.00E+00	3.32E+01
Skid Steer (Bobcat)	0.62	7	50	1.08E-05	9.96E-06	1.25E-04	3.92E-05	1.23E-04	1.65E-07	1.27E-02	3.54E-06	0.00E+00	1.28E-02	2.17E-02	1.99E-02	2.50E-01	7.84E-02	2.46E-01	3.30E-04	2.55E+01	7.07E-03	0.00E+00	2.56E+01
Welding Machine	0.45	5	50	1.45E-05	1.33E-05	1.52E-04	6.22E-05	1.36E-04	1.68E-07	1.30E-02	5.62E-06	0.00E+00	1.31E-02	2.90E-02	2.67E-02	3.04E-01	1.24E-01	2.73E-01	3.35E-04	2.59E+01	1.12E-02	0.00E+00	2.62E+01
Equipment fueled with Propane				**Emission factors (ton/hr)**																			
Aerial Lift	0.51	6	120	1.39E-06	1.39E-06	7.09E-04	2.48E-06	1.02E-04	0.00E+00	1.56E-02	2.08E-05	0.00E+00	1.61E-02	2.78E-03	2.78E-03	1.42E+00	4.95E-03	2.03E-01	0.00E+00	3.12E+01	4.15E-02	0.00E+00	3.21E+01
Fork Lift	0.30	4	50	8.14E-07	8.14E-07	1.48E-04	1.41E-06	6.05E-05	0.00E+00	9.15E-03	1.18E-05	0.00E+00	9.40E-03	1.63E-03	1.63E-03	2.95E-01	2.82E-03	1.21E-01	0.00E+00	1.83E+01	2.36E-02	0.00E+00	1.88E+01
Telehandler	0.51	6	120	1.39E-06	1.39E-06	7.09E-04	2.48E-06	1.02E-04	0.00E+00	1.56E-02	2.08E-05	0.00E+00	1.61E-02	2.78E-03	2.78E-03	1.42E+00	4.95E-03	2.03E-01	0.00E+00	3.12E+01	4.15E-02	0.00E+00	3.21E+01
Vehicles with Onroad Engines for Emissions Estimates	**Onsite Miles per Day Travelled per Vehicle**	**Hours/Day**	**Vehicle Weight (lbs)**	**Emission factors (g/mile)**																			
Concrete Delivery Truck for general construction	7	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.18E-03	1.95E-03	1.61E-02	7.59E-03	3.58E-02	3.85E-05	4.07E+00	6.55E-06	6.17E-06	4.07E+00
Concrete Delivery Truck for bridge	1.6	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	4.98E-04	4.47E-04	3.67E-03	1.73E-03	8.18E-03	8.81E-06	9.30E-01	1.50E-06	1.41E-06	9.30E-01
Concrete Pump Truck for bridge	0.1	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	3.11E-05	2.79E-05	2.29E-04	1.08E-04	5.11E-04	5.51E-07	5.81E-02	9.36E-08	8.81E-08	5.81E-02
Dump Truck	3.6	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.12E-03	1.00E-03	8.26E-03	3.90E-03	1.84E-02	1.98E-05	2.09E+00	3.37E-06	3.17E-06	2.09E+00
Flatbed Truck	14.4	12	20,000	5.80E-01	5.19E-01	5.22E+00	4.53E-01	9.31E+00	1.40E-02	1.51E+03	1.10E-03	1.70E-03	1.51E+03	1.53E-03	1.37E-03	1.38E-02	1.20E-03	2.46E-02	3.70E-05	3.98E+00	2.91E-06	4.49E-06	3.98E+00
Staff & Security Truck	26	24	4,500	1.00E-02	1.00E-02	2.10E+00	5.50E-02	3.00E-02	9.00E-03	3.26E+02	1.04E-01	8.13E-02	3.54E+02	2.39E-05	2.39E-05	5.01E-03	1.31E-04	7.16E-05	2.15E-05	7.79E-01	2.47E-04	1.94E-04	8.44E-01
Pickup Truck	3.6	12	8,000	7.20E-02	5.47E-02	5.04E+00	3.47E-01	4.70E-01	7.00E-03	7.22E+02	7.04E-02	6.47E-02	7.44E+02	4.76E-05	3.61E-05	3.33E-03	2.29E-04	3.11E-04	4.63E-06	4.77E-01	4.65E-05	4.28E-05	4.91E-01
Water/Soiltac Truck	7.2	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.24E-03	2.01E-03	1.65E-02	7.80E-03	3.68E-02	3.96E-05	4.18E+00	6.74E-06	6.34E-06	4.19E+00
General Materials Delivery Truck for general cons	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
General Materials Delivery Truck for bridge	1.6	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.49E-04	2.23E-04	1.83E-03	8.67E-04	4.09E-03	4.41E-06	4.65E-01	7.49E-07	7.05E-07	4.65E-01
Suncatcher Pedestals Delivery Truck	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Stirling Engines Delivery Truck	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Suncatcher Metal Supports Delivery Truck	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Suncatcher Mirrors Delivery Truck	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Electrical and Control Systems Delivery Truck	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Azimuth and Elevation Drive Delivery Truck	7	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Water Delivery Trucks	7	24	39,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.09E-03	9.77E-04	8.03E-03	3.79E-03	1.79E-02	1.93E-05	2.03E+00	3.28E-06	3.08E-06	2.03E+00
Worker Passenger Vehicles	9	24	4,000	7.20E-02	5.47E-02	5.04E+00	3.47E-01	4.70E-01	7.00E-03	7.22E+02	7.04E-02	6.47E-02	3.54E+02	5.95E-05	4.52E-05	4.16E-03	2.87E-04	3.88E-04	5.78E-06	5.96E-01	5.81E-05	5.34E-05	6.14E-01

Notes:

1. Emission factors from CARB Off-road Mobile Source Emission Factors (2006-2020) for diesel and propane equipment. (2009 data used).
   Dozer = Crawler Tractor
   Loader = Rubber Tired Loader
   Backhoe = Tractors/Loaders/Backhoes
   Light Tower = Other Construction Equipment
2. Utilization Load Factors from SCAQMD
3. $PM_{2.5}$ emission factors obtained by multiplying the PM_{10} emissions by $PM_{2.5}$ fraction in SCAQMD CEIDARS list for onroad or offroad diesel vehicles.
4. For propane equipment assumed $PM_{2.5}$ and PM_{10} Fraction of total PM is 1.000
5. Onroad vehicle emissions from EMFAC2007 model. The vehicle description in EMFAC2007 model are as follows:
   - Flatbed Truck is Medium-Heavy-Duty (MHD-DSL)
   - Staff & Security Truck (gasoline) is Light-Heavy-Duty (LDT2-CAT)
   - Worker Passenger Vehicle and Pickup Truck are Passenger Car (LDA-ALL)
   - Concrete Delivery Truck, Concrete Pump Truck, Dump Truck, Water/Soiltac Truck, General Materials Delivery Trucks, Suncatcher Pedestals Delivery Truck, Stirling Engines Delivery Truck, Suncatcher Metal Supports Delivery Truck, Suncatcher Mirrors Delivery Truck, Electrical and Control Systems Delivery Truck, Azimuth and Elevation Drive Delivery Truck,
6. The emissions of "Toyota Highlander Hybrid" (Staff & Security Truck) meet the Tier 2/Bin 3 Federal emissions standard (reference source 3) and its performance is 27 mile/gallon in city (from Toyota website)
7. SO_2 emission factors for the Toyota Highlander Hybrid are from EMFAC2007- Light-Duty Trucks (LDT2-CAT).
8. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. Hybrid Truck is assumed to be gasoline light truck here.
9. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

CO_2 GWP (SAR, 1996) =	1
CH_4 GWP (SAR, 1996) =	21
N_2O GWP (SAR, 1996) =	310

Solar One (Phase I Only)

Combustion Exhaust Emissions Off-site (short-term)

To be consistent with on-site emissions, months 5 was used to represent the daily/monthly construction off-site (on-road) emissions.

construction schedule = 12 hours per day 7 am to 7 pm pedestal installation = 16 hours per day

delivery trucks can arrive at the site anytime during the day or night

EMISSION FACTORS

Vehicles with Onroad Engines for Emissions Estimates	Off-site Miles per Day Travelled within MDAQMD jurisdictional area per Vehicle	Hours/Day	Vehicle Weight (lbs)	Emission factors (g/mile)										Emission rate per piece of equipment (lb/hr)									
				PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e	PM_{10}	$PM_{2.5}$	CO	VOC	NO_x	SO_2	CO_2	CH_4	N_2O	CO_2e
Concrete Delivery Truck for general construction	74	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.30E-02	2.07E-02	1.70E-01	8.02E-02	3.79E-01	4.07E-04	4.30E+01	6.93E-05	6.52E-05	4.30E+01
Concrete Delivery Truck for bridge	74	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.30E-02	2.07E-02	1.70E-01	8.02E-02	3.79E-01	4.07E-04	4.30E+01	6.93E-05	6.52E-05	4.30E+01
Concrete Pump Truck for bridge	0	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dump Truck	0	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Flatbed Truck	0	12	20,000	5.80E-01	5.19E-01	5.22E+00	4.53E-01	9.31E+00	1.40E-02	1.51E+03	1.10E-03	1.70E-03	1.51E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Staff & Security Truck	0	24	4,500	1.00E-02	1.00E-02	2.10E+00	5.50E-02	3.00E-02	9.00E-03	3.26E+02	1.04E-01	8.13E-02	3.54E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pickup Truck	0	12	8,000	7.20E-02	5.47E-02	5.04E+00	3.47E-01	4.70E-01	7.00E-03	7.22E+02	7.04E-02	6.47E-02	7.44E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Water/Soiltac Truck	0	12	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
General Materials Delivery Truck for general cor	74	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.15E-02	1.03E-02	8.49E-02	4.01E-02	1.89E-01	2.04E-04	2.15E+01	3.46E-05	3.26E-05	2.15E+01
General Materials Delivery Truck for bridge	74	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	1.15E-02	1.03E-02	8.49E-02	4.01E-02	1.89E-01	2.04E-04	2.15E+01	3.46E-05	3.26E-05	2.15E+01
Suncatcher Pedestals Delivery Truck	200	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	3.11E-02	2.79E-02	2.29E-01	1.08E-01	5.11E-01	5.51E-04	5.81E+01	9.36E-05	8.81E-05	5.81E+01
Stirling Engines Delivery Truck	160	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.49E-02	2.23E-02	1.83E-01	8.67E-02	4.09E-01	4.41E-04	4.65E+01	7.49E-05	7.05E-05	4.65E+01
Suncatcher Metal Supports Delivery Truck	180	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.80E-02	2.51E-02	2.06E-01	9.75E-02	4.60E-01	4.96E-04	5.23E+01	8.43E-05	7.93E-05	5.23E+01
Suncatcher Mirrors Delivery Truck	160	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.49E-02	2.23E-02	1.83E-01	8.67E-02	4.09E-01	4.41E-04	4.65E+01	7.49E-05	7.05E-05	4.65E+01
Electrical and Control Systems Delivery Truck	200	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	3.11E-02	2.79E-02	2.29E-01	1.08E-01	5.11E-01	5.51E-04	5.81E+01	9.36E-05	8.81E-05	5.81E+01
Azimuth and Elevation Drive Delivery Truck	160	24	40,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	2.49E-02	2.23E-02	1.83E-01	8.67E-02	4.09E-01	4.41E-04	4.65E+01	7.49E-05	7.05E-05	4.65E+01
Water Delivery Trucks	24	24	39,000	1.69E+00	1.52E+00	1.25E+01	5.91E+00	2.79E+01	3.00E-02	3.17E+03	5.10E-03	4.80E-03	3.17E+03	3.73E-03	3.35E-03	2.75E-02	1.30E-02	6.14E-02	6.61E-05	6.97E+00	1.12E-05	1.06E-05	6.98E+00
Worker Passenger Vehicles	74	24	4,000	7.20E-02	5.47E-02	5.04E+00	3.47E-01	4.70E-01	7.00E-03	7.22E+02	7.04E-02	6.47E-02	3.54E+02	4.89E-04	3.72E-04	3.42E-02	2.36E-03	3.19E-03	4.75E-05	4.90E+00	4.78E-04	4.39E-04	5.05E+00

Notes:

1. Onroad vehicle emissions from EMFAC2007 model. The vehicle description in EMFAC2007 model are as follows:
   - Flatbed Truck is Medium-Heavy-Duty (MHD-DSL)
   - Staff & Security Truck (gasoline) is Light-Heavy-Duty (LDT2-CAT)
   - Worker Passenger Vehicle and Pickup Truck are Passenger Car (LDA-ALL)
   - Concrete Delivery Truck, Concrete Pump Truck, Dump Truck, Water/Soiltac Truck, General Materials Delivery Trucks, Suncatcher Pedestals Delivery Truck, Stirling Engines Delivery Truck, Suncatcher Metal Supports Delivery Truck, Suncatcher Mirrors Delivery
2. The emissions of "Toyota Highlander Hybrid" (Staff & Security Truck) meet the Tier 2/Bin 3 Federal emissions standard (reference source 3) and its performance is 27 mile/gallon in city (from Toyota website)
3. SO_2 emission factors for the Toyota Highlander Hybrid are from EMFAC2007- Light-Duty Trucks (LDT2-CAT).
4. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. Hybrid Truck is assumed to be gasoline light truck here.
5. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

CO_2 GWP (SAR, 1996) =	1
CH_4 GWP (SAR, 1996) =	21
N_2O GWP (SAR, 1996) =	310

Solar One (Phase I Only)
Fugitive Dust Emissions (on-site)

Travel on sealed roads (paved)

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$ EPA AP-42 Section 13.2.1 Paved Roads Equation 2

E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest
7.4 sL = road surface silt loading (grams per square meter) (g/m^2), from Table 13.2.1-4 for Municipal solid waste landfill
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants
Solar One Technicians

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	Number of Vehicles (month 5)	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on sealed roads	Max Daily Distance per Vehicle to drive on sealed roads (mile/day)	Max Daily VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Number of Vehicles (months 1-28)	Max Annual VMT (all vehicles)	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Diesel Construction Equipment											
Air Compressor	3	0	0%	0.0	0	0.5	6	25	0	0.000	0.002
Asphalt Paver	0	0.2	0%	0.0	0	25	7	1	0	0.133	0.886
Backhoe	6	0	0%	0.0	0	11	6	62	0	0.038	0.258
Compactor	4	0	0%	0.0	0	10	6	37	0	0.033	0.224
Crane small	8	0.5	50%	0.3	2	10	5	145	942.5	0.033	0.224
Crane large	4	0.5	0%	0.0	0	35	7	24	0	0.220	1.468
Dozer	1	0	0%	0.0	0	20	7	10	0	0.095	0.634
Generator	5	0	0%	0.0	0	0.5	9	56	0	0.000	0.002
Grader	3	0	0%	0.0	0	20	7	24	0	0.095	0.634
Light Tower	2	0	0%	0.0	0	0.25	7	22	0	0.000	0.000
Loader	4	0	0%	0.0	0	25	6	37	0	0.133	0.886
Maxi Sneeker (Trencher)	5	0	0%	0.0	0	5	8	50	0	0.012	0.079
Skid Steer (Bobcat)	3	0	0%	0.0	0	2	7	29	0	0.003	0.020
Welding Machine	5	0	0%	0.0	0	0.5	5	42	0	0.000	0.002
Equipment fueled with Propane											
Aerial Lift	6	1	50%	0.5	3	4	6	108	1404	0.008	0.056
Fork Lift	8	1	50%	0.5	4	3	4	142	1846	0.005	0.036
Telehandler	5	1	50%	0.5	3	3	6	86	1118	0.005	0.036
Vehicles with Onroad Engines for Emissions Estimates											
Concrete Delivery Truck for general constructio	0	7	90%	6.3	0	20	12	8	1310.4	0.095	0.634
Concrete Delivery Truck for bridge	1	1.6	90%	1.4	1	20	12	11	411.84	0.095	0.634
Concrete Pump Truck for bridge	1	0.1	90%	0.1	0	20	12	7	16.38	0.095	0.634
Dump Truck	5	3.6	50%	1.8	9	20	12	38	1778.4	0.095	0.634
Flatbed Truck	10	14.4	100%	14.4	144	10	12	206	77126.4	0.033	0.224
Staff & Security Truck	6	26	100%	26.0	156	2.25	24	168	113568	0.003	0.023
Pickup Truck	11	3.6	95%	3.4	38	4	12	308	27387.36	0.008	0.056
Water/Soiltac Truck	5	7.2	25%	1.8	9	20	12	110	5148	0.095	0.634
General Materials Delivery Truck for general co	3	7	100%	7.0	21	20	24	15	2730	0.095	0.634
General Materials Delivery Truck for bridge	2	1.6	100%	1.6	3	20	24	24	998.4	0.095	0.634
Suncatcher Pedestals Delivery Truck	3	7	50%	3.5	11	20	24	19	1729	0.095	0.634
Stirling Engines Delivery Truck	6	7	100%	7.0	42	20	24	168	30576	0.095	0.634
Suncatcher Metal Supports Delivery Truck	11	7	100%	7.0	77	20	24	308	56056	0.095	0.634
Suncatcher Mirrors Delivery Truck	7	7	100%	7.0	49	20	24	196	35672	0.095	0.634
Electrical and Control Systems Delivery Truck	2	7	100%	7.0	14	20	24	56	10192	0.095	0.634
Azimuth and Elevation Drive Delivery Truck	2	7	100%	7.0	14	20	24	56	10192	0.095	0.634
Water Delivery Trucks	19	7	100%	7.0	133	19.5	24	532	96824	0.091	0.610
Worker Passenger Vehicles	422	9	100%	9.0	3798	2	24	6600	1544400	0.003	0.020

Solar One (Phase I Only)
Fugitive Dust Emissions (offsite)

Travel on paved road

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$

EPA AP-42 Section 13.2.1 Paved Roads Equation 2
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest

0.02 sL = road surface silt loading (grams per square meter) (g/m^2), Freeway Local Streets & Freeways (emission inventory code: 640-641-5400-0000)
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	Number of Vehicles (month 5)	Number of Vehicles (months 1-28)	Max Daily Offsite Round-trip Distance per Vehicle within MDAQMD Jurisdictional Area (mile/day)	Max Daily VMT (all vehicles)	Max Annual VMT (all vehicles)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Vehicles with Onroad Engines for Emissions Estimates										
Concrete Delivery Truck for general construction	0	8	74	0	15392	20	12	26	0.002	0.013
Concrete Delivery Truck for bridge	1	11	74	74	21164	20	12	26	0.002	0.013
Concrete Pump Truck for bridge	1	7	0	0	0	20	12	26	0.002	0.013
Dump Truck	5	38	0	0	0	20	12	26	0.002	0.013
Flatbed Truck	10	206	0	0	0	10	12	26	0.000	0.004
Staff & Security Truck	6	168	0	0	0	2.25	24	26	0.000	0.000
Pickup Truck	11	308	0	0	0	4	12	26	0.000	0.001
Water/Soiltac Truck	5	110	0	0	0	20	12	26	0.002	0.013
General Materials Delivery Truck for general constru	3	15	74	222	28860	20	24	26	0.002	0.013
General Materials Delivery Truck for bridge	2	24	74	148	46176	20	24	26	0.002	0.013
Suncatcher Pedestals Delivery Truck	3	19	200	600	98800	20	24	26	0.002	0.013
Stirling Engines Delivery Truck	6	168	160	960	698880	20	24	26	0.002	0.013
Suncatcher Metal Supports Delivery Truck	11	308	180	1980	1441440	20	24	26	0.002	0.013
Suncatcher Mirrors Delivery Truck	7	196	160	1120	815360	20	24	26	0.002	0.013
Electrical and Control Systems Delivery Truck	2	56	200	400	291200	20	24	26	0.002	0.013
Azimuth and Elevation Drive Delivery Truck	2	56	160	320	232960	20	24	26	0.002	0.013
Water Delivery Trucks	19	532	24	456	331968	19.5	24	26	0.002	0.013
Worker Passenger Vehicles	422	6600	74	31228	12698400	2	24	26	6.44E-05	4.30E-04

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Vehicles with Onroad Engines for Emissions Estimates															
Concrete Delivery Truck for general construction	0%	0%	0.00	0.00	0.00	0.00	0.00%	0.10	0.10	0.00	0.00	0.00	0.00	0.01	0.01
Concrete Delivery Truck for bridge	0%	0%	0.08	0.08	0.97	0.97	1.02%	0.14	0.14	0.01	0.01	0.12	0.12	0.02	0.02
Concrete Pump Truck for bridge	0%	0%	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
Dump Truck	0%	0%	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
Flatbed Truck	0%	0%	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
Staff & Security Truck	0%	0%	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
Pickup Truck	0%	0%	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
Water/Soiltac Truck	0%	0%	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
General Materials Delivery Truck for general constru	0%	0%	0.12	0.12	2.91	2.91	3.05%	0.19	0.19	0.02	0.02	0.37	0.37	0.02	0.02
General Materials Delivery Truck for bridge	0%	0%	0.08	0.08	1.94	1.94	2.03%	0.30	0.30	0.01	0.01	0.25	0.25	0.04	0.04
Suncatcher Pedestals Delivery Truck	0%	0%	0.33	0.33	7.87	7.87	8.24%	0.65	0.65	0.04	0.04	1.01	1.01	0.08	0.08
Stirling Engines Delivery Truck	0%	0%	0.52	0.52	12.60	12.60	13.18%	4.59	4.59	0.07	0.07	1.62	1.62	0.59	0.59
Suncatcher Metal Supports Delivery Truck	0%	0%	1.08	1.08	25.98	25.98	27.18%	9.46	9.46	0.14	0.14	3.33	3.33	1.21	1.21
Suncatcher Mirrors Delivery Truck	0%	0%	0.61	0.61	14.70	14.70	15.37%	5.35	5.35	0.08	0.08	1.89	1.89	0.69	0.69
Electrical and Control Systems Delivery Truck	0%	0%	0.22	0.22	5.25	5.25	5.49%	1.91	1.91	0.03	0.03	0.67	0.67	0.25	0.25
Azimuth and Elevation Drive Delivery Truck	0%	0%	0.17	0.17	4.20	4.20	4.39%	1.53	1.53	0.02	0.02	0.54	0.54	0.20	0.20
Water Delivery Trucks	0%	0%	0.24	0.24	5.75	5.75	6.02%	2.09	2.09	0.03	0.03	0.73	0.73	0.27	0.27
Worker Passenger Vehicles	0%	0%	0.56	0.56	13.42	13.42	14.03%	2.73	2.73	0.08	0.08	2.01	2.01	0.41	0.41
TOTAL Fugitive emissions for vehicle travel offsite paved roads			**4.02**	**4.02**	**95.60**	**95.60**		**29.04**	**29.04**	**0.53**	**0.53**	**12.55**	**12.55**	**3.78**	**3.78**

Number of Vehicles per year = sum of monthly daily maximum vehicle usage for the peak 12 months
delivery trucks can arrive at the site anytime during the day or night

Title : Solar 1 - construction
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2009/07/20 11:14:26
Scen Year: 2010 -- All model years in the range 1970 to 2010 selected
Season : Annual
Area : Mojave Desert AQMD
****

Year: 2010 -- Model Years 1970 to 2010 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Mojave Desert AQMD

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22.205	24.278	3.173	18.897	22.205	23.591	3.173	13.039	22.205	23.578	3.173	6.173	0	0	12.427	12.315	22.205	22.362	3.173	14.913	0	0	0	0	0	0	0	0	22.205	23.151	3.173	4.12	0	0	0	0	0.12	0.552	10.984	2.635
10	14.202	0.289	0.376	0.347	14.686	0.513	0.159	0.717	14.847	0.369	0.271	0.452	18.717	0.358	0.159	0.446	11.869	0.354	0.285	0.352	11.869	0.684	0.406	0.575	17.854	1.769	0.453	0.689	62.152	6.908	5.905	5.916	17.854	2.488	0.573	1.803	0	5.369	1.005	3.525	4.307	2.953	0	3.79	17.854	8.128	0.804	1.23	17.854	1.471	0.227	1.976	7.828	0.398	5.13	1.464
50	4.751	0.058	0.12	0.077	4.915	0.114	0.051	0.187	4.97	0.077	0.086	0.105	6.282	0.071	0.051	0.1	1.717	0.05	0.091	0.062	1.717	0.094	0.129	0.117	2.621	0.246	0.144	0.165	9.324	0.989	0.662	0.665	2.621	0.328	0.182	0.28	0	0.792	0.272	0.572	3.322	1.755	0	2.723	2.621	1.18	0.256	0.312	2.621	0.199	0.072	0.28	3.832	0.09	0.585	0.248

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	137.652	145.041	26.3	114.773	137.652	142.592	26.3	82.499	137.652	142.545	26.3	43.396	0	0	48.228	47.79	137.652	138.21	26.3	94.772	0	0	0	0	0	0	0	0	137.652	141.023	26.3	31.753	0	0	0	0	0.741	3.31	43.912	11.402
10	111.78	4.601	2.001	5.039	115.265	8.92	1.491	10.166	115.224	6.065	1.792	6.681	222.495	5.139	1.463	6.174	217.08	3.745	1.873	3.55	217.08	7.591	2.188	5.439	325.62	19.825	5.221	8.173	1591.863	101.375	12.495	13.352	325.62	31.47	6.316	22.821	0	37.206	4.779	23.505	32.594	14.82	0	25.802	325.62	69.54	8.975	13.863	325.62	33.055	2.613	41.18	65.76	6.086	11.217	8.063
50	57.364	2.36	0.526	2.584	59.152	4.466	0.392	5.092	59.131	3.077	0.471	3.392	114.181	2.637	0.385	3.166	60.356	1.041	0.492	0.98	60.356	2.111	0.575	1.495	90.535	5.512	1.373	2.205	442.598	28.186	3.024	3.267	90.535	8.75	1.66	6.308	0	10.345	1.021	6.405	42.989	13.359	0	31.665	90.535	19.335	2.36	3.725	90.535	9.191	0.687	11.445	50.169	3.024	2.724	3.714

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.458	1.598	75.051	20.315	1.458	1.551	75.051	39.522	1.458	1.55	75.051	64.233	0	0	110.403	109.401	1.458	1.469	75.051	30.028	0	0	0	0	0	0	0	0	1.458	1.522	75.051	71.539	0	0	0	0	0.008	0.036	101.889	20.437
10	3.721	0.454	1.824	0.47	3.662	0.863	1.851	0.967	3.678	0.873	1.815	0.892	6.252	0.848	1.866	0.879	1.921	0.32	5.069	1.532	1.921	0.6	6.414	3.608	2.882	1.701	9.307	8.191	20.94	6.818	27.866	27.675	2.882	3.626	11.599	6.718	0	3.954	15.39	8.786	1.142	1.236	0	1.178	2.882	3.399	18.086	17.381	2.882	1.514	11.841	2.682	2.037	0.683	24.892	5.553
50	5.297	0.287	1.47	0.309	5.212	0.563	1.492	0.692	5.235	0.546	1.463	0.576	8.9	0.532	1.503	0.576	2.663	0.443	4.084	1.374	2.663	0.831	5.168	3.077	3.995	2.357	7.499	6.747	29.023	9.449	15.02	14.97	3.995	5.026	9.346	6.698	0	5.48	10.91	7.775	1.586	1.215	0	1.444	3.995	4.711	14.573	14.096	3.995	2.098	9.541	2.976	2.87	0.463	13.659	3.144

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4776.9	4776.9	4098	4603.896	4776.9	4776.899	4098	4426.172	4776.899	4776.899	4097.999	4197.918	0	0	6617.134	6557.045	4776.9	4776.9	4098	4513.396	0	0	0	0	0	0	0	0	4776.9	4776.9	4098	4130.425	0	0	0	0	25.717	109.627	6070.009	1302.131
10	992.919	721.665	360.78	722.118	995.718	896.942	346.668	865.564	995.712	897.586	353.701	896.712	1228.158	1226.862	347.557	1223.128	1672.267	1672.267	519.521	1378.514	1672.267	1672.267	526.92	1080.567	1672.267	1672.267	1505	1529.618	1672.267	1672.267	3165.447	3151.887	1672.267	1672.267	1505	1607.345	0	1672.267	2432.723	1993.587	195.022	223.718	0	205.989	1672.267	1672.267	1505	1512.989	1672.267	1672.267	1505	1654.211	473.833	869.625	2845.762	1259.141
50	402.817	292.772	360.78	293.353	403.952	363.879	346.668	363.486	403.95	364.141	353.701	364.342	498.251	497.725	347.557	497.088	464.953	464.953	519.521	478.858	464.953	464.953	526.92	496.966	464.953	464.953	1505	1351.928	464.953	464.953	1670.679	1659.73	464.953	464.953	1505	868.63	0	464.953	2432.723	1296.407	97.623	162.112	0	122.268	464.953	464.953	1505	1455.327	464.953	464.953	1505	577.226	201.308	347.006	1559.739	587.594

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.049	0.049	0.039	0.046	0.049	0.049	0.039	0.044	0.049	0.049	0.039	0.041	0	0	0.063	0.063	0.049	0.049	0.039	0.045	0	0	0	0	0	0	0	0	0.049	0.049	0.039	0.04	0	0	0	0	0	0.001	0.058	0.012
10	0.012	0.007	0.003	0.007	0.012	0.009	0.003	0.008	0.012	0.009	0.003	0.009	0.016	0.012	0.003	0.012	0.02	0.016	0.005	0.013	0.02	0.016	0.005	0.01	0.022	0.016	0.014	0.015	0.042	0.018	0.03	0.03	0.022	0.017	0.014	0.016	0	0.017	0.023	0.02	0.002	0.002	0	0.002	0.022	0.017	0.014	0.015	0.022	0.017	0.014	0.017	0.006	0.008	0.027	0.012
50	0.005	0.003	0.003	0.003	0.005	0.004	0.003	0.004	0.005	0.004	0.003	0.004	0.007	0.005	0.003	0.005	0.005	0.004	0.005	0.005	0.005	0.004	0.005	0.005	0.006	0.005	0.014	0.013	0.011	0.005	0.016	0.016	0.006	0.005	0.014	0.008	0	0.005	0.023	0.012	0.002	0.002	0	0.002	0.006	0.005	0.014	0.014	0.006	0.005	0.014	0.006	0.003	0.003	0.015	0.006

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.756	0.193	0	0	0.883	0.456	0	0	0.976	0.833	0	0	1.777	1.761	0	0	1.489	0.578	0	0	0	0	0	0	0	0	0	0	1.215	1.157	0	0	0	0	0	0	1.615	0.323
10	0.074	0.051	0.283	0.051	0.072	0.06	0.103	0.063	0.075	0.11	0.196	0.11	0.076	0.094	0.105	0.094	0.066	0.017	0.075	0.032	0.066	0.024	0.096	0.061	0.066	0.034	0.555	0.478	0.066	0.056	1.63	1.615	0.066	0.049	0.699	0.302	0	0.053	0.407	0.203	0.063	0.004	0	0.041	0.066	0.05	1.114	1.063	0.066	0.012	0.405	0.056	0.067	0.069	1.446	0.345
50	0.025	0.011	0.09	0.011	0.024	0.013	0.033	0.015	0.025	0.024	0.063	0.024	0.026	0.02	0.033	0.02	0.01	0.003	0.024	0.008	0.01	0.004	0.03	0.018	0.01	0.005	0.177	0.152	0.01	0.008	0.488	0.484	0.01	0.007	0.223	0.091	0	0.008	0.11	0.051	0.049	0.002	0	0.031	0.01	0.008	0.355	0.338	0.01	0.002	0.129	0.016	0.041	0.015	0.434	0.099

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.012	0.012	0	0.012	0.008	0.01	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.005	0.008	0.032	0.013
50	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.008	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.036	0.036	0.012	0.012	0.012	0.012	0	0.012	0.008	0.01	0.004	0.004	0	0.004	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.005	0.008	0.032	0.013

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.008	0.013	0.026	0.015
50	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.028	0.028	0.028	0.028	0.013	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.013	0.008	0.013	0.026	0.015

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	7.301	12.14	0	12.12	7.243	9.708	0	9.667	7.24	9.754	0	9.74	5.413	7.168	0	7.159	4.32	5.277	0	5.275	4.32	5.254	0	5.248	3.955	5.185	0	5.163	2.028	4.78	0	4.77	3.955	5.123	0	5.115	0	5.07	0	5.07	34.065	34.531	0	34.243	3.955	4.903	0	4.748	3.955	5.125	0	5.074	25.193	10.653	0	10.942
50	17.435	29.864	0	29.813	17.283	23.863	0	23.752	17.279	23.996	0	23.957	12.699	17.646	0	17.622	15.67	18.984	0	18.978	15.67	18.91	0	18.889	14.39	18.676	0	18.599	7.445	17.287	0	17.252	14.39	18.464	0	18.439	0	18.316	0	18.316	50.361	46.901	0	49.039	14.39	17.749	0	17.201	14.39	18.456	0	18.279	39.382	26.061	0	26.326

Pollutant Name: Diesel - mi/gal Temperature: 70F Relative Humidity: 20%

Speed MPH	LDA NCAT	LDA CAT	LDA DSL	LDA ALL	LDT1 NCAT	LDT1 CAT	LDT1 DSL	LDT1 ALL	LDT2 NCAT	LDT2 CAT	LDT2 DSL	LDT2 ALL	MDV NCAT	MDV CAT	MDV DSL	MDV ALL	LHD1 NCAT	LHD1 CAT	LHD1 DSL	LHD1 ALL	LHD2 NCAT	LHD2 CAT	LHD2 DSL	LHD2 ALL	MHD NCAT	MHD CAT	MHD DSL	MHD ALL	HHD NCAT	HHD CAT	HHD DSL	HHD ALL	OBUS NCAT	OBUS CAT	OBUS DSL	OBUS ALL	UBUS NCAT	UBUS CAT	UBUS DSL	UBUS ALL	MCY NCAT	MCY CAT	MCY DSL	MCY ALL	SBUS NCAT	SBUS CAT	SBUS DSL	SBUS ALL	MH NCAT	MH CAT	MH DSL	MH ALL	ALL NCAT	ALL CAT	ALL DSL	ALL ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	27.939	27.939	0	0	29.076	29.076	0	0	28.498	28.498	0	0	29.002	29.002	0	0	19.402	19.402	0	0	19.13	19.13	0	0	6.698	6.698	0	0	3.184	3.184	0	0	6.698	6.698	0	0	4.143	4.143	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	5.141	5.141
50	0	0	27.939	27.939	0	0	29.076	29.076	0	0	28.498	28.498	0	0	29.002	29.002	0	0	19.402	19.402	0	0	19.13	19.13	0	0	6.698	6.698	0	0	6.033	6.033	0	0	6.698	6.698	0	0	4.143	4.143	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	7.592	7.592

Title : Solar_1_2009MY_EF
Version : Emfac2007 V2.3 Nov 1 2006
Run Date : 2009/07/07 17:16:26
Scen Year: 2009 -- Model year 2009 selected
Season : Annual
Area : Mojave Desert AQMD
****

Year: 2009 -- Model Years 2009 to 2009 Inclusive -- Annual
Emfac2007 Emission Factors: V2.3 Nov 1 2006

District Average District Average Mojave Desert AQMD

Table 1: Running Exhaust Emissions (grams/mile; grams/idle-hour)

Pollutant Name: Reactive Org Gases Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27.137	3.173	22.607	0	27.137	3.173	17.068	0	27.137	3.173	7.73	0	0	7.652	7.508	0	27.137	3.173	7.73	0	0	0	0	0	0	0	0	0	27.137	3.173	6.512	0	0	0	0	0	1.09	7.078	2.023
10	0	0.017	0	0.017	0	0.017	0	0.017	0	0.027	0	0.027	0	0.03	0	0.03	0	0.026	0.164	0.052	0	0.026	0.164	0.084	0	0.041	0.111	0.097	0	0.909	1.033	1.03	0	0.041	0.109	0.096	0	0.041	0.063	0.049	4.28	3.096	0	3.484	0	0.041	0.096	0.088	0	0.041	0.085	0.044	4.28	0.089	0.92	0.256
50	0	0.004	0	0.004	0	0.004	0	0.004	0	0.006	0	0.006	0	0.006	0	0.006	0	0.004	0.052	0.013	0	0.004	0.052	0.024	0	0.006	0.035	0.03	0	0.103	0.136	0.135	0	0.006	0.035	0.029	0	0.006	0.017	0.01	3.3	1.72	0	2.238	0	0.006	0.03	0.027	0	0.006	0.027	0.008	3.3	0.041	0.124	0.082

Pollutant Name: Carbon Monoxide Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	155.23	26.3	130.861	0	155.23	26.3	101.057	0	155.23	26.3	50.82	0	0	41.429	40.652	0	155.23	26.3	50.819	0	0	0	0	0	0	0	0	0	155.23	26.3	44.264	0	0	0	0	0	6.238	39.45	11.407
10	0	0.497	0	0.497	0	0.497	0	0.497	0	0.742	0	0.742	0	0.933	0	0.933	0	0.32	1.138	0.474	0	0.32	1.138	0.664	0	0.497	1.68	1.455	0	47.62	2.235	3.086	0	0.496	1.66	1.439	0	0.531	2.506	1.262	31.844	12.142	0	18.605	0	0.487	1.454	1.32	0	0.48	1.292	0.541	31.844	0.984	2.132	1.43
50	0	0.262	0	0.262	0	0.262	0	0.262	0	0.391	0	0.391	0	0.492	0	0.492	0	0.089	0.299	0.129	0	0.089	0.299	0.177	0	0.138	0.442	0.384	0	13.24	0.858	1.091	0	0.138	0.437	0.38	0	0.148	0.535	0.291	42	8.189	0	19.279	0	0.135	0.382	0.348	0	0.134	0.34	0.149	42	0.515	0.797	0.916

Pollutant Name: Oxides of Nitrogen Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.79	75.051	15.637	0	1.79	75.051	32.572	0	1.79	75.051	61.118	0	0	123.519	121.203	0	1.79	75.051	61.119	0	0	0	0	0	0	0	0	0	1.79	75.051	64.843	0	0	0	0	0	0.072	117.204	18.49
10	0	0.039	0	0.039	0	0.039	0	0.039	0	0.062	0	0.062	0	0.065	0	0.065	0	0.075	3.569	0.735	0	0.075	3.569	1.543	0	0.117	4.248	3.463	0	2.561	11.965	11.789	0	0.117	4.245	3.46	0	0.148	0.906	0.428	1.162	1.222	0	1.202	0	0.116	4.209	3.639	0	0.117	4.181	0.421	1.162	0.081	10.946	1.799
50	0	0.024	0	0.024	0	0.024	0	0.024	0	0.038	0	0.038	0	0.04	0	0.04	0	0.104	2.876	0.628	0	0.104	2.876	1.269	0	0.162	3.423	2.803	0	3.549	4.722	4.7	0	0.162	3.42	2.801	0	0.205	0.642	0.367	1.614	1.064	0	1.244	0	0.16	3.392	2.941	0	0.162	3.369	0.402	1.614	0.065	4.521	0.779

Pollutant Name: Carbon Dioxide Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4776.9	4098	4648.583	0	4776.9	4098	4491.644	0	4776.9	4098	4227.112	0	0	6617.134	6493.061	0	4776.9	4098	4227.11	0	0	0	0	0	0	0	0	0	4776.9	4098	4192.593	0	0	0	0	0	191.961	6288.367	1148.935
10	0	712.801	0	712.801	0	899.79	0	899.79	0	899.79	0	899.79	0	1223.764	0	1223.764	0	1672.267	519	1454.292	0	1672.267	519	1187.695	0	1672.267	1505	1536.811	0	1672.267	3165.446	3137.449	0	1672.267	1505	1536.81	0	1672.267	2151.152	1849.526	199.079	233.302	0	222.077	0	1672.267	1505	1528.306	0	1672.267	1505	1659.767	199.079	865.521	2896.897	1179.218
50	0	289.176	0	289.176	0	365.035	0	365.035	0	365.035	0	365.035	0	496.468	0	496.468	0	464.953	519	475.168	0	464.953	519	487.662	0	464.953	1505	1307.206	0	464.953	1670.679	1648.071	0	464.953	1505	1307.208	0	464.953	2151.152	1089.098	99.654	181.779	0	154.842	0	464.953	1505	1360.087	0	464.953	1505	542.676	99.654	343.001	1590.651	537.096

Pollutant Name: Sulfur Dioxide Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.049	0.039	0.047	0	0.049	0.039	0.045	0	0.049	0.039	0.041	0	0	0.063	0.062	0	0.049	0.039	0.041	0	0	0	0	0	0	0	0	0	0.049	0.039	0.041	0	0	0	0	0	0.002	0.06	0.011
10	0	0.007	0	0.007	0	0.009	0	0.009	0	0.009	0	0.009	0	0.012	0	0.012	0	0.016	0.005	0.014	0	0.016	0.005	0.011	0	0.016	0.014	0.015	0	0.017	0.03	0.03	0	0.016	0.014	0.015	0	0.016	0.021	0.018	0.003	0.003	0	0.003	0	0.016	0.014	0.015	0	0.016	0.014	0.005	0.003	0.008	0.028	0.011
50	0	0.003	0	0.003	0	0.004	0	0.004	0	0.004	0	0.004	0	0.005	0	0.005	0	0.004	0.005	0.005	0	0.004	0.005	0.005	0	0.004	0.014	0.012	0	0.005	0.016	0.016	0	0.004	0.014	0.012	0	0.004	0.021	0.01	0.002	0.002	0	0.002	0	0.004	0.014	0.013	0	0.004	0.014	0.005	0.002	0.003	0.015	0.005

Pollutant Name: PM10 Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.011	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.033	0.012
50	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.011	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.033	0.012

Pollutant Name: PM10 - Tire Wear Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.011	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.033	0.012
50	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.008	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0	0.012	0.036	0.036	0	0.012	0.012	0.012	0	0.012	0.008	0.011	0.004	0.004	0	0.004	0	0.012	0.012	0.012	0	0.012	0.012	0.012	0.004	0.008	0.033	0.012

Pollutant Name: PM10 - Break Wear Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.012	0.026	0.015
50	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0	0.028	0.028	0.028	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.006	0	0.006	0	0.013	0.013	0.013	0	0.013	0.013	0.013	0.006	0.012	0.026	0.015

Pollutant Name: Gasoline - mi/gal Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	12.417	0	12.417	0	9.839	0	9.839	0	9.834	0	9.834	0	7.231	0	7.231	0	5.297	0	5.297	0	5.297	0	5.297	0	5.296	0	5.296	0	5.063	0	5.063	0	5.296	0	5.296	0	5.296	0	5.296	33.703	33.764	0	33.744	0	5.296	0	5.296	0	5.296	0	5.296	33.703	11.125	0	11.355
50	0	30.598	0	30.598	0	24.247	0	24.247	0	24.232	0	24.232	0	17.82	0	17.82	0	19.052	0	19.052	0	19.052	0	19.052	0	19.048	0	19.048	0	18.224	0	18.224	0	19.048	0	19.048	0	19.048	0	19.048	50.244	44.225	0	46.2	0	19.049	0	19.049	0	19.049	0	19.049	50.244	26.873	0	27.111

Pollutant Name: Diesel - mi/gal Temperature: 70F Relative Humidity: 20%

Speed	LDA	LDA	LDA	LDA	LDT1	LDT1	LDT1	LDT1	LDT2	LDT2	LDT2	LDT2	MDV	MDV	MDV	MDV	LHD1	LHD1	LHD1	LHD1	LHD2	LHD2	LHD2	LHD2	MHD	MHD	MHD	MHD	HHD	HHD	HHD	HHD	OBUS	OBUS	OBUS	OBUS	UBUS	UBUS	UBUS	UBUS	MCY	MCY	MCY	MCY	SBUS	SBUS	SBUS	SBUS	MH	MH	MH	MH	ALL	ALL	ALL	ALL
MPH	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL	NCAT	CAT	DSL	ALL
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.422	19.422	0	0	19.422	19.422	0	0	6.698	6.698	0	0	3.184	3.184	0	0	6.698	6.698	0	0	4.686	4.686	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	4.4	4.4
50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19.422	19.422	0	0	19.422	19.422	0	0	6.698	6.698	0	0	6.033	6.033	0	0	6.698	6.698	0	0	4.686	4.686	0	0	0	0	0	0	6.698	6.698	0	0	6.698	6.698	0	0	6.889	6.889

ALT-5

Attachment ALT-5
Construction Emissions
(Nov. 20, 2009)

Table DR-136e
Solar One (Phase I Only)
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.0001	0.0001	0.0006	0.0002	0.0068	0.0002
Maintenance & Security Vehicles and Equipment	0.03	0.03	23.65	3.39	1.48	0.01
Worker Vehicles	0.01	0.01	0.63	0.04	0.06	0.00
Visitor Cars and Delivery Trucks	0.01	0.00	0.08	0.02	0.08	0.00
Subtotal of On-site Combustion Emissions	**0.05**	**0.04**	**24.36**	**3.45**	**1.63**	**0.01**
On-Site Fugitive Emissions						
Maintenance & Security Vehicles and Equipment	15.05	2.23				
Worker Vehicles	1.91	0.26				
Visitor Cars and Delivery Trucks	1.45	0.20				
Gasoline Tank				1.00		
Subtotal of On-Site Fugitive Emissions	**18.42**	**2.69**	**0.00**	**1.00**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**18.46**	**2.73**	**24.36**	**4.45**	**1.63**	**0.01**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.07	0.04	3.44	0.09	0.40	0.01
Visitor Cars and Delivery Trucks	0.02	0.02	0.31	0.03	0.43	0.00
Subtotal of Off-Site Combustion Emissions	**0.09**	**0.05**	**3.74**	**0.12**	**0.83**	**0.01**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	2.33	0.06				
Visitor Cars and Delivery Trucks	1.75	0.24				
Subtotal of Off-Site Fugitive Emissions	**4.08**	**0.30**				
Subtotal of Off-Site Emissions	**4.17**	**0.36**	**3.74**	**0.12**	**0.83**	**0.01**
Total Maximum Emissions	**22.63**	**3.08**	**28.10**	**4.57**	**2.45**	**0.02**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

Table DR-136f
Solar One (Phase I Only)
Estimated Annual Maximum Operational Greenhouse Gases Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
On-Site Operational Emissions					
On-Site Combustion Emissions					
Diesel Generator	0.81	0.00	0.00	0.00	0.82
Maintenance & Security Vehicles and Equipment	965.31	0.27	0.06	0.00	988.73
Worker Vehicles	138.42	0.01	0.01	0.00	142.35
Visitor Cars and Delivery Trucks	20.86	0.00	0.00	0.00	21.11
Potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment				0.02	384.42
Subtotal of On-Site Emissions	**1,125.40**	**0.28**	**0.07**	**0.02**	**1,537.42**
Off-Site On-Road Emissions					
Off-Site Combustion Emissions					
Worker Vehicles	594.02	0.14	0.12	0.00	635.57
Visitor Cars and Delivery Trucks	102.84	0.01	0.01	0.00	105.43
Subtotal of Off-Site Emissions	**696.86**	**0.14**	**0.13**	0.00	**741.00**
Total Maximum Emissions	**1,822.26**	**0.43**	**0.20**	**0.02**	**2,278.42**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

Table DR-136g
Solar One (Phase II Only)
Estimated Annual Maximum Operational Emissions of Criteria Pollutants (tons/year)

Activity	PM_{10}	$PM_{2.5}$	CO	ROC	NO_x	SO_x
On-Site Operational Emissions						
On-Site Combustion Emissions						
Diesel Generator	0.0001	0.0001	0.0006	0.0002	0.0068	0.0002
Maintenance & Security Vehicles and Equipment	0.0178	0.0162	2.7237	0.0247	0.7589	0.0021
Worker Vehicles	0.0098	0.0074	0.4209	0.0257	0.0385	0.0010
Visitor Cars and Delivery Trucks	0.0031	0.0027	0.0481	0.0124	0.0509	0.0001
Subtotal of On-site Combustion Emissions	**0.03**	**0.03**	**3.19**	**0.06**	**0.86**	**0.00**
On-Site Fugitive Emissions						
Maintenance & Security Vehicles and Equipment	13.15	1.95				
Worker Vehicles	1.28	0.17				
Visitor Cars and Delivery Trucks	0.81	0.12				
Gasoline Tank				0.98		
Subtotal of On-Site Fugitive Emissions	**15.23**	**2.24**	**0.00**	**0.98**	**0.00**	**0.00**
Subtotal of On-Site Emissions	**15.26**	**2.27**	**3.19**	**1.04**	**0.86**	**0.00**
Off-Site On-Road Emissions						
Off-Site Combustion Emissions						
Worker Vehicles	0.05	0.03	2.29	0.06	0.26	0.005
Visitor Cars and Delivery Trucks	0.01	0.00	0.16	0.01	0.10	0.000
Subtotal of Off-Site Combustion Emissions	**0.05**	**0.03**	**2.45**	**0.07**	**0.36**	**0.00**
Off-Site Paved Road Fugitive Emissions						
Worker Vehicles	1.55	0.04				
Visitor Cars and Delivery Trucks	0.42	0.05				
Subtotal of Off-Site Fugitive Emissions	**1.98**	**0.09**				
Subtotal of Off-Site Emissions	**2.03**	**0.12**	**2.45**	**0.07**	**0.36**	**0.00**
Total Maximum Emissions	**17.30**	**2.39**	**5.64**	**1.11**	**1.22**	**0.01**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

Table DR-136h
Solar One (Phase II Only)
Estimated Annual Maximum Operational Greenhouse Gases Emissions (metric tonnes/year)

Activity	CO_2	CH_4	N_2O	SF_6	CO_2e
On-Site Operational Emissions					
On-Site Combustion Emissions					
Diesel Generator	-	-	-	-	-
Maintenance & Security Vehicles and Equipment	311.60	0.15	0.02	-	321.63
Worker Vehicles	92.28	0.01	0.01	-	94.90
Visitor Cars and Delivery Trucks	13.23	0.00	0.00	-	13.40
Potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment				-	-
Subtotal of On-Site Emissions	**417.11**	**0.16**	**0.03**	**-**	**429.92**
Off-Site On-Road Emissions					
Off-Site Combustion Emissions					
Worker Vehicles	396.01	0.09	0.08	-	423.71
Visitor Cars and Delivery Trucks	37.01	0.01	0.01	-	38.70
Subtotal of Off-Site Emissions	**433.02**	**0.10**	**0.09**	**-**	**462.41**
Total Maximum Emissions	**850.13**	**0.25**	**0.12**	**-**	**892.33**

Note: Addition of Phase I only and Phase II only operational emissions will be greater than the maximum annual operational emissions for the total project. This is due to the addition of an emergency generator and gasoline tank in the Phase II only case.

Solar One

Emissions from Emergency Diesel Generator

Rated Horsepower	**335**	**BHP**
Testing duration	**20**	**min/month**
Yearly testing	**12**	**month/year**
Expected non-emergency usage	**4**	**hr/yr**

Pollutant	Emision Factor	Emission Rate	Emission Rate per Testing	Yearly Emissions	Hourly Emission Rate	Annual Emission Rate
	g/HP/Hr	lb/hr	lb	lb/yr	g/s	g/s
NO_X	4.61	3.41	1.14	13.63	0.143	1.96E-04
CO	0.39	0.29	0.10	1.15	0.012	1.66E-05
VOC (Total Hydrocarbons)	0.15	0.11	0.04	0.44	0.005	6.38E-06
SO_X	0.12	0.09	0.03	0.35	0.004	5.10E-06
PM_{10}	0.06	0.04	0.01	0.18	0.002	2.55E-06
$PM_{2.5}$	0.06	0.04	0.01	0.18	0.002	2.55E-06
CO_2		447.54	149.18	1790.15	18.797	2.57E-02
CH_4		0.02	0.01	0.07	0.001	1.01E-06
N_2O		0.004	0.0015	0.02	0.0002	2.54E-07
CO_2e		449.28	149.76	1797.10	18.870	2.58E-02

Engine parameters

Flow Rate (acfm)	1218	17.726 m/s
Exhaust Temp (degrees C)	465	738.15 K
Stack Diameter (feet)	0.6667	0.2032 m
Stack height (feet) above ground	6.5	1.981 m
Fuel Use (gal/hr)[2]	20	20.000 gal/hr

Note:

1. The stack will be in outdoor enclosures, not in buildings.
2. Fuel use value is based on the engine parameter data in CARB Table 1 of "Risk Management Guidance for the Permitting of New Stationary Diesel-Fueled Engines", Oct 2000.
3. Emission rates for the criteria pollutant are based on vendor data (to meet Tier 3 requirements).
4. Greenhouse gas emission factors from CCAR General Reporting Protocol V3.1 January 2009 Tables C.7 and C.9
5. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
   - CO_2 GWP (SAR, 1996) = 1
   - CH_4 GWP (SAR, 1996) = 21
   - N_2O GWP (SAR, 1996) = 310
6. PM2.5 emissions are assumed to be the same as the PM10 emissions

Solar One

Phase I

Equipment = 5000-gal above ground storage tank
Fuel = Gasoline
Dimension= 88" W x 299" L x 67" H
Throughput (gal/year) = 90,000
Days of Operations (days/year) = 365

Description	TOG Emission Factor[2] (lbs/1000 gal)	TOG Emissions[1] (tons/Year)	TOG Emissions[1] (lbs/day)
Working Loss[3]		0.409	2.242
Breathing Loss[3]		0.536	2.935
Vehicle Refueling - Vapor Displacement	0.74	0.033	0.182
Vehicle Refueling - Spillage	0.42	0.019	0.104
Total Vehicle Refueling		0.052	0.286
Total TOG Emissions		**0.997**	**5.463**

Note:

1. Emission estimate based on 90,000 gallon per year tank throughput.
2. Emission factors from CARB Emission Inventory Estimation Guidelines Section 4.10 GASOLINE DISPENSING FACILITIES (Revised May 1999)
3. Emission estimates from EPA Tank4.0.9d model results

Phase II

Equipment = 5000-gal above ground storage tank
Fuel = Gasoline
Dimension= 88" W x 299" L x 67" H
Throughput (gal/year) = 60,000
Days of Operations (days/year) = 365

Description	TOG Emission Factor[2] (lbs/1000 gal)	TOG Emissions[1] (tons/Year)	TOG Emissions[1] (lbs/day)
Working Loss[3]		0.409	2.242
Breathing Loss[3]		0.536	2.935
Vehicle Refueling - Vapor Displacement	0.74	0.022	0.122
Vehicle Refueling - Spillage	0.42	0.013	0.069
Total Vehicle Refueling		0.035	0.191
Total TOG Emissions		**0.980**	**5.368**

Note:

1. Emission estimate based on 90,000 gallon per year tank throughput.
2. Emission factors from CARB Emission Inventory Estimation Guidelines Section 4.10 GASOLINE DISPENSING FACILITIES (Revised May 1999)
3. Emission estimates from EPA Tank4.0.9d model results

Solar One

Estimated maximum potential sulfur hexafluoride (SF_6) emissions leakage emissions from proposed circuit breakers and other transmissions system equipment

Breaker	Qty	Typical Make	Typical Model	SF6 Lbs/Bkr	Leakage Rate	Leakage Lbs/Yr (per Bkr)	Leakage Lbs/Yr (All Bkrs)	CO_2e emissions (metric tons/Yr)
34.5kV Solar Group Breaker (3000A)	6	GE-Hitachi HVB	HS Series	31	1%	0.31	1.86	20.16
242kV Power Circuit Breaker (2000A)	8	GE-Hitachi HVB	HP Series	240	1%	2.4	19.2	208.14
242kV Coupling Capacitor Voltage Transformer (900A)	6	GE-Hitachi HVB	HP Series	240	1%	2.4	14.4	156.11
							CO_2e emissions (metric tons/Yr)	384.42

Note:

Greenhouse Gas Global Warming Potentials (GWPs) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)

Greenhouse Gas	GWP (SAR, 1996)
SF_6	23,900

OPERATIONS AND MAINTENANCE VEHICLES REQUIREMENTS (FOR PHASE I)

Description	Activity	Make / Model	Fuel	Quantity	Frequency	Horse-power	Vehicle Weight (tons)	Assumed idle time on site during washing & maintaining the sunchatchers per vehicle (idle hr/day)	Max Daily Onsite Distance per Vehicle (mile/day)	Assumed distance percentage to drive on onsite sealed roads	Max Daily Offsite Round-trip Distance per Vehicle within MDAQMD jurisdictional area (mile/day)	Travel to and from	Max Daily Total Distance per Vehicle (mile/day)	Max. Operating Hours / Day	Max. Operating Days / Month
Washing Vehicle	Mirror Washing	12 ton Truck	Gasoline	50	Daily	225	12	4.0	3.6	100%	0	on-site only	3.6	8	30
LRU Maintenance Truck with Boom	Field Servicing & Maintenance	10 ton Truck	Gasoline	28	Daily	200	10	4.0	3.6	100%	0	on-site only	3.6	8	30
Staff & Security Truck	Site Inspections & Security	Toyota Highlander or similar	Gasoline - Hybrid	7	Daily	187	2.25		26	100%	0	on-site only	26	24	30
Rubber-wheeled forklift with telescoping boom	SunCatcher PCU & Mirror Maintenance	Telehandler	Propane	2	Daily	50	4		10	100%	0	on-site only	10	8	30
Forklift	Warehousing of supplies		Propane	2	Daily	50	3		10	50%	0	on-site only	10	8	30
Telescoping Man Lift	Facility Maintenance and SunCatcher PCU & Mirror Maintenance		Propane	6	Daily	50	3		10	100%	0	on-site only	10	8	30
Staff Cars	Community to Work	Passenger vehicles	Gasoline & diesel	72	Daily	100	2		7	94%	74	Barstow	81	2	30
Van Pooling		Passenger Truck/Van	Gasoline	3	Daily	150	4		7	94%	74	Barstow	81	2	30
Visitor Cars	Sales, Deliveries, Services	Passenger vehicles	Gasoline & diesel	6	Daily	100	2		7	94%	74	Barstow	81	8	22
Delivery Trucks	Operations and Maintenance Supplies	5 ton Cargo	Diesel	1	Weekly	200	5		7	94%	124	Barstow/ Detroit	131	2	5
	Waste Management	20 ton	Diesel	1	Weekly	250	20		7	94%	130	Class III sites	137	2	5
	Hazardous Waste	20 ton	Diesel	1	Weekly	250	20		7	94%	156	Class I sites	163	2	5
Transport Tractor Trailers	Spare Parts, Building Supplies, Temporary Rental Equipment	40-foot	Diesel	1	Weekly	250	20		7	94%	124	Barstow/ Detroit	131	2	5
Water Delivery Trucks	All onsite water will be delivered by truck	7500 gal truck	Diesel	1	Daily	450	19.5		7	94%	24	Newberry Springs	31	8	30
Hydrogen Delivery Trucks	delivery hydrogen to hydrogen tank in MSC	tanker truck	Diesel	1	Monthly	250	20		7	94%	160	Ontario	167	8	3

Note:

1. **Bold** are offroad equipment
2. All other vehicles and equipment will use on-road engines
3. Average distance from main service complex to center of north portion of the site (Phase I) is 1.8 miles. Thus, the average round trip distance for each each maintenance and washing vehicle travels is 3.6 [=1.8 *2] miles.
4. Average distance from the Project site entrance to the Main Service Complex is about 3.5 miles.
5. The fenceline perimeter for Phase I site is approximately 20 miles. Each security vehicle is assumed to travel from the MSC around the perimeter plus one trip to the center of north fenced property (1.8 miles) and back (and plus additional 10% for misc trips) = approximately 26 miles.
6. 70% of the time the Project will get the supplies from Barstow, CA area and 30% of the time the Project will get the supplies from Detroit, MI.
7. The distance from the Project site to Barstow is approximately 37 miles.
8. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward Detroit is about 120 miles.
9. Two CLASS I sites are: (1) Clean Harbors Buttonwillow Landfill (Solid Waste Facility) Lokern Road Kern County, CA - 214 miles to Solar One site; (2) Chemical Waste Management Kettleman Hills Landfill (Solids Waste Facility) 36251 Old Skyline Road Kettleman City, CA 93239 - 240 miles to Solar One site. Information is from the AFC Table 5.14-1.
10. The distance from the Project site to the edge of the MDAQMD jurisdictional area toward the Class I sites is about 78 miles.
11. Average distance to the Class III site is about 65 miles (within the MDAQMD jurisdictional area). It is assumed half of the general solid waste will go to the disposal site in Barstow and the other half will go to the other Class III sites listed in the AFC Table 5.14-1
12. Distance for water delivery truck travels was provided by the applicant (12 miles one way trip from Newberry Springs to Project site entrance).
13. Distance for hydrogen delivery trucks travels was provided by the applicant (80 miles one way trip from edge of southwest MDAQMD to Project site entrance).

Solar One - Operation and Maintenance Equipment Emissions (on-site)

Emission Factors For Combustion Exhaust Emissions

				Emission Factors (unit: g/mile or g/idle-hr for on-road vehicle and lb/hr for off-road equipment)									
Equipment Description	**Horse-power**	**Vehicle Weight (lbs)**	**Fuel**	**PM_{10}**	**$PM_{2.5}$**	**CO**	**ROG**	**NO_x**	**SO_x**	**CO_2**	**CH_4**	**N_2O**	**Total GHG - CO_2e**
On-road Vehicle													
Washing Vehicle (running)	225	24,000	Gasoline	0.032	0.015	0.497	0.041	0.117	0.016	1672.267	0.104	0.081	1699.64
Washing Vehicle (idling)	225	24,000	Gasoline	0.000	0.000	155.230	27.137	1.790	0.049	4776.900	0.296	0.232	4855.10
LRU Maintenance Truck with Boom (running)	200	20,000	Gasoline	0.032	0.015	0.497	0.041	0.117	0.016	1672.267	0.104	0.081	1699.64
LRU Maintenance Truck with Boom (idling)	200	20,000	Gasoline	0.000	0.000	155.230	27.137	1.790	0.049	4776.900	0.296	0.232	4855.10
Staff & Security Truck	187	4,500	Gasoline - Hybrid	0.010	0.010	2.100	0.055	0.030	0.009	326.296	0.104	0.081	353.67
Staff Cars	100	4,000	Gasoline & diesel	0.072	0.055	3.121	0.192	0.286	0.007	712.582	0.070	0.065	734.12
Van Pooling	150	8,000	Gasoline	0.039	0.024	0.933	0.030	0.065	0.012	1223.764	0.016	0.010	1227.22
Visitor Cars	100	4,000	Gasoline & diesel	0.072	0.055	3.121	0.192	0.286	0.007	712.582	0.070	0.065	734.12
Operations and Maintenance Supplies truck	200	10,000	Diesel	0.089	0.068	1.857	0.261	3.793	0.005	519.299	0.005	0.005	520.89
Waste Management truck	250	40,000	Diesel	0.923	0.815	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Hazardous Waste truck	250	40,000	Diesel	0.923	0.815	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Transport Tractor Trailers truck	250	40,000	Diesel	0.923	0.815	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Water Delivery Trucks	450	39,000	Diesel	0.923	0.815	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Hydrogen Delivery Trucks	250	40,000	Diesel	0.923	0.815	8.172	3.888	17.517	0.030	3165.446	0.005	0.005	3167.04
Off-road Equipment													
Rubber-wheeled forklift with telescoping boom	50	8,000	Propane	0.002	0.002	0.295	0.002	0.086	0.000	18.295	0.017	0.001	19.07
Forklift	50	6,000	Propane	0.002	0.002	0.295	0.002	0.086	0.000	18.295	0.017	0.001	19.07
Telescoping Man Lift	50	6,000	Propane	0.002	0.002	0.295	0.002	0.086	0.000	18.295	0.017	0.001	19.07

Note:

1. Vehicle description in EMFAC2007 model
   - Washing vehicle is Medium-Heavy-Duty (MHD-CAT)
   - LRU Maintenance Truck with Boom is Light-Heavy-Duty (MHD-CAT)
   - Staff & Security Truck (gasoline) is Light-Heavy-Duty (LDT2-CAT)
   - Staff Car is Passenger Cars (LDA-ALL)
   - Van Pooling is Medium-Duty Trucks (MDV-CAT)
   - Visitor Cars is Passenger Cars (LDA-ALL)
   - Operations and Maintenance Supplies Delivery Truck is Light-Heavy-Duty (LHD1-DSL)
   - Waste Management Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Hazardous Waste Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Transport Tractor Trailer is Heavy-Heavy-Duty (HHD-DSL)
   - Water Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
   - Hydrogen Delivery Truck is Heavy-Heavy-Duty (HHD-DSL)
2. Criteria pollutant emission factors for propane fuel off-road equipment obtained from CARB OFFROAD2007.
3. Rubber-wheeled forklift with telescoping boom and telescoping man lift are all forklifts
4. PM emission factors determined using guidance from SCAQMD Final - Methodology to Calculate PM_{10} and $PM_{2.5}$ Significance Thresholds 10/1/2006, Appendix A - Updated CEIDARS Table with $PM_{2.5}$ Fractions

   On-road vehicles
   - $PM_{2.5}$ Fraction of PM_{10}, Brake wear: 0.429
   - $PM_{2.5}$ Fraction of PM_{10}, Diesel: 0.920
   - $PM_{2.5}$ Fraction of PM_{10}, Gasoline-catalyst: 0.928
   - $PM_{2.5}$ Fraction of PM_{10}, Tire wear: 0.250
   - Assume $PM_{2.5}$ and PM_{10} Fraction of total PM for gasoline hybrid car is: 1.000

   Off-road equipment
   - Assume $PM_{2.5}$ and PM_{10} Fraction of total PM for propane fuel equipment is: 1.000
5. The emissions of "Toyota Highlander Hybrid" meet the Tier 2/Bin 3 Federal emissions standard (reference source 3) and its performance is 27 mile/gallon in city (from Toyota website)
6. SO_2 emission factors for the Toyota Highlander Hybrid are from EMFAC2007- Light-Duty Trucks (LDT2-CAT).
7. N_2O emission factors for propane fuel off-road equipment are from Reference Source 2: Table C.6, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009
8. CO_2 emission factors for gasoline and diesel fuel on-road vehicles are from EMFAC2007 model.
9. CH_4 and N_2O emission factors for the running vehicles are from Reference source 1: Table C.4, California Climate Action Registry General Reporting Protocol Version 3.1, January 2009. Hybrid Truck is assumed to be gasoline light truck here.
10. CH_4 and N_2O emission factors for the idling vehicles are scaled from the same type of running vehicle emission factor.
11. Greenhouse Gas Global Warming Potential (GWP) - Intergovernmental Panel on Climate Change, Second Assessment Report (1996)
    - CO_2 GWP (SAR, 1996) = 1
    - CH_4 GWP (SAR, 1996) = 21
    - N_2O GWP (SAR, 1996) = 310

Daily Emissions For Combustion Exhaust Emissions

Equipment Description	No. Of Units	Max Daily Distance per Vehicle (mile/day)	Max Daily VMT (all units)	Max. Daily Emissions (lb/day) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle													
Washing Vehicle (running)	50	3.6	180	0.013	0.006	0.197	0.016	0.046	0.006	663.013	0.041	0.032	673.867
Washing Vehicle (idling)	50	-	-	-	-	68.383	11.955	0.789	0.022	2,104.361	0.130	0.102	2,138.812
LRU Maintenance Truck with Boom (running)	28	3.6	101	0.007	0.003	0.110	0.009	0.026	0.004	371.287	0.023	0.018	377.366
LRU Maintenance Truck with Boom (idling)	28	-	-	-	-	38.295	6.695	0.442	0.012	1,178.442	0.073	0.057	1,197.734
Staff & Security Truck	7	26.0	182	0.004	0.004	0.842	0.022	0.012	0.004	130.806	0.041	0.033	141.781
Staff Cars	72	7.0	504	0.080	0.061	3.465	0.213	0.317	0.008	791.060	0.078	0.072	814.967
Van Pooling	3	7.0	21	0.002	0.001	0.043	0.001	0.003	0.001	56.606	0.001	0.000	56.766
Visitor Cars	6	7.0	42	0.007	0.005	0.289	0.018	0.026	0.001	65.922	0.007	0.006	67.914
Operations and Maintenance Supplies truck	1	7.0	7	0.001	0.001	0.029	0.004	0.058	0.000	8.007	0.000	0.000	8.031
Waste Management truck	1	7.0	7	0.014	0.013	0.126	0.060	0.270	0.000	48.806	0.000	0.000	48.831
Hazardous Waste truck	1	7.0	7	0.014	0.013	0.126	0.060	0.270	0.000	48.806	0.000	0.000	48.831
Transport Tractor Trailers truck	1	7.0	7	0.014	0.013	0.126	0.060	0.270	0.000	48.806	0.000	0.000	48.831
Water Delivery Trucks	1	7.0	7	0.014	0.013	0.126	0.060	0.270	0.000	48.806	0.000	0.000	48.831
Hydrogen Delivery Trucks	1	7.0	7	0.014	0.013	0.126	0.060	0.270	0.000	48.806	0.000	0.000	48.831
Off-road Equipment													
Rubber-wheeled forklift with telescoping boom	2			0.026	0.026	4.715	0.032	1.381	-	292.714	0.268	0.022	305.075
Forklift	2			0.026	0.026	4.715	0.032	1.381	-	292.714	0.268	0.022	305.075
Telescoping Man Lift	6			0.078	0.078	14.146	0.096	4.142	-	878.143	0.805	0.065	915.224
Max. Daily Emissions Total (lb/day)				**0.31**	**0.27**	**135.86**	**19.39**	**9.97**	**0.06**	**7,077.11**	**1.74**	**0.43**	**7,246.77**

Hourly Emissions For Combustion Exhaust Emissions

Equipment Description	Max. Operating Hours / Day	Max. Hourly Emissions (lb/hr) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle											
Washing Vehicle (running)	8	0.002	0.001	0.025	0.002	0.006	0.001	82.877	0.005	0.004	84.233
Washing Vehicle (idling)	8	-	-	8.548	1.494	0.099	0.003	263.045	0.016	0.013	267.351
LRU Maintenance Truck with Boom (running)	8	0.001	0.000	0.014	0.001	0.003	0.000	46.411	0.003	0.002	47.171
LRU Maintenance Truck with Boom (idling)	8	-	-	4.787	0.837	0.055	0.002	147.305	0.009	0.007	149.717
Staff & Security Truck	24	0.000	0.000	0.035	0.001	0.001	0.000	5.450	0.002	0.001	5.908
Staff Cars	2	0.040	0.030	1.732	0.107	0.159	0.004	395.530	0.039	0.036	407.484
Van Pooling	2	0.001	0.001	0.022	0.001	0.002	0.000	28.303	0.000	0.000	28.383
Visitor Cars	8	0.001	0.001	0.036	0.002	0.003	0.000	8.240	0.001	0.001	8.489
Operations and Maintenance Supplies truck	2	0.001	0.001	0.014	0.002	0.029	0.000	4.003	0.000	0.000	4.016
Waste Management truck	2	0.007	0.006	0.063	0.030	0.135	0.000	24.403	0.000	0.000	24.416
Hazardous Waste truck	2	0.007	0.006	0.063	0.030	0.135	0.000	24.403	0.000	0.000	24.416
Transport Tractor Trailers truck	2	0.007	0.006	0.063	0.030	0.135	0.000	24.403	0.000	0.000	24.416
Water Delivery Trucks	8	0.002	0.002	0.016	0.007	0.034	0.000	6.101	0.000	0.000	6.104
Hydrogen Delivery Trucks	8	0.002	0.002	0.016	0.007	0.034	0.000	6.101	0.000	0.000	6.104
Off-road Equipment											
Rubber-wheeled forklift with telescoping boom	8	0.003	0.003	0.589	0.004	0.173	-	36.589	0.034	0.003	38.134
Forklift	8	0.003	0.003	0.589	0.004	0.173	-	36.589	0.034	0.003	38.134
Telescoping Man Lift	8	0.010	0.010	1.768	0.012	0.518	-	109.768	0.101	0.008	114.403
Max. Hourly Emissions Total (lb/hr)		**0.09**	**0.07**	**18.38**	**2.57**	**1.69**	**0.01**	**1,249.52**	**0.24**	**0.08**	**1,278.88**

Yearly Emissions For Combustion Exhaust Emissions

Equipment Description	Max. Operating Days / Month	Max. Annual Emissions (ton/year) PM_{10}	$PM_{2.5}$	CO	ROG	NO_x	SO_x	CO_2	CH_4	N_2O	Total GHG - CO_2e
On-road Vehicle											
Washing Vehicle (running)	30	0.002	0.001	0.035	0.003	0.008	0.001	119.342	0.007	0.006	121.296
Washing Vehicle (idling)	30	-	-	12.309	2.152	0.142	0.004	378.785	0.023	0.018	384.986
LRU Maintenance Truck with Boom (running)	30	0.001	0.001	0.020	0.002	0.005	0.001	66.832	0.004	0.003	67.926
LRU Maintenance Truck with Boom (idling)	30	-	-	6.893	1.205	0.079	0.002	212.120	0.013	0.010	215.592
Staff & Security Truck	30	0.001	0.001	0.152	0.004	0.002	0.001	23.545	0.007	0.006	25.521
Staff Cars	30	0.014	0.011	0.624	0.038	0.057	0.001	142.391	0.014	0.013	146.694
Van Pooling	30	0.000	0.000	0.008	0.000	0.001	0.000	10.189	0.000	0.000	10.218
Visitor Cars	22	0.001	0.001	0.038	0.002	0.003	0.000	8.702	0.001	0.001	8.965
Operations and Maintenance Supplies truck	5	0.000	0.000	0.001	0.000	0.002	0.000	0.240	0.000	0.000	0.241
Waste Management truck	5	0.000	0.000	0.004	0.002	0.008	0.000	1.464	0.000	0.000	1.465
Hazardous Waste truck	5	0.000	0.000	0.004	0.002	0.008	0.000	1.464	0.000	0.000	1.465
Transport Tractor Trailers truck	5	0.000	0.000	0.004	0.002	0.008	0.000	1.464	0.000	0.000	1.465
Water Delivery Trucks	30	0.003	0.002	0.023	0.011	0.049	0.000	8.785	0.000	0.000	8.790
Hydrogen Delivery Trucks	3	0.000	0.000	0.002	0.001	0.005	0.000	0.879	0.000	0.000	0.879
Off-road Equipment											
Rubber-wheeled forklift with telescoping boom	30	0.005	0.005	0.849	0.006	0.248	-	52.689	0.048	0.004	54.913
Forklift	30	0.005	0.005	0.849	0.006	0.248	-	52.689	0.048	0.004	54.913
Telescoping Man Lift	30	0.014	0.014	2.546	0.017	0.745	-	158.066	0.145	0.012	164.740
Max. Annual Emissions Total (ton/year)		**0.05**	**0.04**	**24.36**	**3.45**	**1.62**	**0.01**	**1,239.64**	**0.31**	**0.08**	**1,270.07**

Solar One
Fugitive Dust Emissions (on-site)

Travel on sealed roads (paved)

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$ EPA AP-42 Section 13.2.1 Paved Roads Equation 2

E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest
7.4 sL = road surface silt loading (grams per square meter) (g/m^2), from AP-42 Table 13.2.1-4 for Municipal solid waste landfill
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on sealed roads	Max Daily Distance per Vehicle to drive on sealed roads (mile/day)	Max Daily VMT (all units)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Washing Vehicle	50	3.6	100%	4	180	12	8	30	0.044	0.294
LRU Maintenance Truck with Boom	28	3.6	100%	4	101	10	8	30	0.033	0.224
Staff & Security Truck	7	26	100%	26	182	2.25	24	30	0.003	0.023
Rubber-wheeled forklift with telescoping boom	2	10	100%	10	20	4	8	30	0.008	0.056
Forklift	2	10	50%	5	10	3	8	30	0.005	0.036
Telescoping Man Lift	6	10	100%	10	60	3	8	30	0.005	0.036
Staff Cars	72	7	94%	7	474	2.0	2	30	0.003	0.020
Van Pooling	3	7	94%	7	20	4	2	30	0.008	0.056
Visitor Cars	6	7	94%	7	39	2	8	22	0.003	0.020
Operations and Maintenance Supplies truck	1	7	94%	7	7	5	2	5	0.012	0.079
Waste Management truck	1	7	94%	7	7	20	2	5	0.095	0.634
Hazardous Waste truck	1	7	94%	7	7	20	2	5	0.095	0.634
Transport Tractor Trailers truck	1	7	94%	7	7	20	2	5	0.095	0.634
Water Delivery Trucks	1	7	94%	7	7	19.5	8	30	0.091	0.610
Hydrogen Delivery Trucks	1	7	94%	7	7	20	8	3	0.095	0.634

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated		Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated	Unmitigated	Mitigated
Washing Vehicle	0%	0%	6.62	6.62	53.00	53.00	45.72%	9.54	9.54	0.99	0.99	7.90	7.90	1.42	1.42
LRU Maintenance Truck with Boom	0%	0%	2.82	2.82	22.57	22.57	19.47%	4.06	4.06	0.42	0.42	3.36	3.36	0.60	0.60
Staff & Security Truck	0%	0%	0.18	0.18	4.27	4.27	3.69%	0.77	0.77	0.02	0.02	0.59	0.59	0.11	0.11
Rubber-wheeled forklift with telescoping boom	0%	0%	0.14	0.14	1.13	1.13	0.97%	0.20	0.20	0.02	0.02	0.16	0.16	0.03	0.03
Forklift	0%	0%	0.05	0.05	0.36	0.36	0.31%	0.07	0.07	0.01	0.01	0.05	0.05	0.01	0.01
Telescoping Man Lift	0%	0%	0.27	0.27	2.18	2.18	1.88%	0.39	0.39	0.04	0.04	0.31	0.31	0.06	0.06
Staff Cars	0%	0%	4.64	4.64	9.29	9.29	8.01%	1.67	1.67	0.63	0.63	1.26	1.26	0.23	0.23
Van Pooling	0%	0%	0.56	0.56	1.11	1.11	0.96%	0.20	0.20	0.08	0.08	0.16	0.16	0.03	0.03
Visitor Cars	0%	0%	0.10	0.10	0.77	0.77	0.67%	0.10	0.10	0.01	0.01	0.10	0.10	0.01	0.01
Operations and Maintenance Supplies truck	0%	0%	0.26	0.26	0.52	0.52	0.45%	0.02	0.02	0.04	0.04	0.08	0.08	0.00	0.00
Waste Management truck	0%	0%	2.09	2.09	4.17	4.17	3.60%	0.13	0.13	0.31	0.31	0.62	0.62	0.02	0.02
Hazardous Waste truck	0%	0%	2.09	2.09	4.17	4.17	3.60%	0.13	0.13	0.31	0.31	0.62	0.62	0.02	0.02
Transport Tractor Trailers truck	0%	0%	2.09	2.09	4.17	4.17	3.60%	0.13	0.13	0.31	0.31	0.62	0.62	0.02	0.02
Water Delivery Trucks	0%	0%	0.50	0.50	4.02	4.02	3.47%	0.72	0.72	0.08	0.08	0.60	0.60	0.11	0.11
Hydrogen Delivery Trucks	0%	0%	0.52	0.52	4.17	4.17	3.60%	0.08	0.08	0.08	0.08	0.62	0.62	0.01	0.01
TOTAL Fugitive emissions for vehicles traveled on sealed road (paved)			**22.92**	**22.92**	**115.90**	**115.90**		**18.19**	**18.19**	**3.35**	**3.35**	**17.06**	**17.06**	**2.67**	**2.67**

Travel on paved road

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$

EPA AP-42 Section 13.2.1 Paved Roads Equation 1
E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest
sL = road surface silt loading (grams per square meter) (g/m^2), use more representative numbers from CARB - Emission Inventory Database - Section 7.8 SJV - Entrained Paved Road Dust - Rural Roads (emission inventory
1.6 code: 640-643-5400-0000), June 2006.
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on paved road	Max Daily Distance per Vehicle to drive on paved road (mile/day)	Max Daily VMT (all units)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Washing Vehicle	50	3.6	0%	0	0	12	8	30	0.016	0.109
LRU Maintenance Truck with Boom	28	3.6	0%	0	0	10	8	30	0.012	0.082
Staff & Security Truck	7	26	0%	0	0	2.25	24	30	0.001	0.008
Rubber-wheeled forklift with telescoping boom	2	10	0%	0	0	4	8	30	0.003	0.021
Forklift	2	10	50%	5	10	3	8	30	0.002	0.013
Telescoping Man Lift	6	10	0%	0	0	3	8	30	0.002	0.013
Staff Cars	72	7	6%	0.42	30	2	2	30	0.001	0.007
Van Pooling	3	7	6%	0.42	1	4	2	30	0.003	0.021
Visitor Cars	6	7	6%	0.42	3	2	8	22	0.001	0.007
Operations and Maintenance Supplies truck	1	7	6%	0.42	0	5	2	5	0.004	0.029
Waste Management truck	1	7	6%	0.42	0	20	2	5	0.035	0.234
Hazardous Waste truck	1	7	6%	0.42	0	20	2	5	0.035	0.234
Transport Tractor Trailers truck	1	7	6%	0.42	0	20	2	5	0.035	0.234
Water Delivery Trucks	1	7	6%	0.42	0	19.5	8	30	0.034	0.225
Hydrogen Delivery Trucks	1	7	6%	0.42	0	20	8	3	0.035	0.234

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]		Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]
Washing Vehicle	0%	0%	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
LRU Maintenance Truck with Boom	0%	0%	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
Staff & Security Truck	0%	0%	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
Rubber-wheeled forklift with telescoping boom	0%	0%	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
Forklift	0%	0%	0.02	0.02	0.13	0.13	14.87%	0.02	0.02	0.00	0.00	0.02	0.02	0.00	0.00
Telescoping Man Lift	0%	0%	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
Staff Cars	0%	0%	0.11	0.11	0.21	0.21	23.75%	0.04	0.04	0.01	0.01	0.02	0.02	0.00	0.00
Van Pooling	0%	0%	0.01	0.01	0.03	0.03	2.92%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Visitor Cars	0%	0%	0.00	0.00	0.02	0.02	1.98%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Operations and Maintenance Supplies truck	0%	0%	0.01	0.01	0.01	0.01	1.37%	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Waste Management truck	0%	0%	0.05	0.05	0.10	0.10	11.10%	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Hazardous Waste truck	0%	0%	0.05	0.05	0.10	0.10	11.10%	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Transport Tractor Trailers truck	0%	0%	0.05	0.05	0.10	0.10	11.10%	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
Water Delivery Trucks	0%	0%	0.01	0.01	0.09	0.09	10.69%	0.02	0.02	0.00	0.00	0.01	0.01	0.00	0.00
Hydrogen Delivery Trucks	0%	0%	0.01	0.01	0.10	0.10	11.10%	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00
TOTAL Fugitive emissions for vehicles traveled on paved road			**0.31**	**0.31**	**0.89**	**0.89**		**0.10**	**0.10**	**0.04**	**0.04**	**0.12**	**0.12**	**0.01**	**0.01**

on-site fugitive

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Max. Operating Hours / Day	Assumed distance percentage to drive on sealed road (paved)	Assumed distance percentage to drive on paved road	Sealed Road - PM_{10} Fugitive Emissions (lb/day)	Paved Road - PM_{10} Fugitive Emissions (lb/day)	Total PM_{10} Fugitive Emissions (lb/day)
Washing Vehicle	50	3.6	8	100%	0%	53.00	0.00	53.00
LRU Maintenance Truck with Boom	28	3.6	8	100%	0%	22.57	0.00	22.57
Staff & Security Truck	7	26	24	100%	0%	4.27	0.00	4.27
Rubber-wheeled forklift with telescoping boom	2	10	8	100%	0%	1.13	0.00	1.13
Forklift	2	10	8	50%	50%	0.36	0.13	0.50
Telescoping Man Lift	6	10	8	100%	0%	2.18	0.00	2.18
Staff Cars	72	7	2	94%	6%	9.29	0.21	9.50
Van Pooling	3	7	2	94%	6%	1.11	0.03	1.14
Visitor Cars	6	7	8	94%	6%	0.77	0.02	0.79
Operations and Maintenance Supplies truck	1	7	2	94%	6%	0.52	0.01	0.53
Waste Management truck	1	7	2	94%	6%	4.17	0.10	4.27
Hazardous Waste truck	1	7	2	94%	6%	4.17	0.10	4.27
Transport Tractor Trailers truck	1	7	2	94%	6%	4.17	0.10	4.27
Water Delivery Trucks	1	7	8	94%	6%	4.02	0.09	4.11
Hydrogen Delivery Trucks	1	7	8	94%	6%	4.17	0.10	4.27
						115.90	**0.89**	**116.79**

Solar One
Fugitive Dust Emissions (off-site)

Travel on paved road

$E = [k * (sL/2)^{0.65} * (W/3)^{1.5} - C] (1 - P/4N)$ EPA AP-42 Section 13.2.1 Paved Roads Equation 2

E = particulate emission factor (lb/VMT),
k = particle size multiplier for particle size range and units of interest
0.32 sL = road surface silt loading (grams per square meter) (g/m^2), From CARB - Emission Inventory Database - Section 7.9 Entrained Paved Road Dust - Local Streets (emission inventory code: 640-641-5400-0000)
W = average weight (tons) of the vehicles traveling the road, and
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

constants

	$PM_{2.5}$	PM_{10}
k	0.0024	0.016
C	0.00036	0.00047

23 P = Mean number of days per year with at least 0.01 inches of precipitation (from Daggett FAA Airport Station)
365 N = number of days in the year (averaging period)

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Assumed distance percentage to drive on paved road	Max Daily Distance per Vehicle to drive on paved road (mile/day)	Max Daily VMT (all units)	Mean Vehicle Weight (tons)	Max. Operating Hours / Day	Max. Operating Days / Month	$PM_{2.5}$ EF (lbs/VMT)	PM_{10} EF (lbs/VMT)
Washing Vehicle	driving on-site only									
LRU Maintenance Truck with Boom										
Staff & Security Truck										
Rubber-wheeled forklift with telescoping boom										
Forklift										
Telescoping Man Lift										
Staff Cars	72	74.0	100%	74	5328	2	2	30	0.000	0.002
Van Pooling	3	74.0	100%	74	222	4	2	30	0.001	0.007
Visitor Cars	6	74.0	100%	74	444	2	8	22	0.000	0.002
Operations and Maintenance Supplies truck	1	124.0	100%	124	124	5	2	5	0.001	0.010
Waste Management truck	1	130.0	100%	130	130	20	2	5	0.012	0.082
Hazardous Waste truck	1	156.0	100%	156	156	20	2	5	0.012	0.082
Transport Tractor Trailers truck	1	124.0	100%	124	124	20	2	5	0.012	0.082
Water Delivery Trucks	1	24.0	100%	24	24	19.5	8	30	0.012	0.079
Hydrogen Delivery Trucks	1	160.0	100%	160	160	20	8	3	0.012	0.082

Vehicle Type	Watering Control Efficiency		PM_{10} Emissions (lb/hr)		PM_{10} Emissions (lb/day)		% of daily emissions	PM_{10} Emissions (tons/year)		$PM_{2.5}$ Emissions (lb/hr)		$PM_{2.5}$ Emissions (lb/day)		$PM_{2.5}$ Emissions (tons/year)	
	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]		Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]	Unmitigated	Mitigated[7]
Washing Vehicle	driving on-site only														
LRU Maintenance Truck with Boom															
Staff & Security Truck															
Rubber-wheeled forklift with telescoping boom															
Forklift															
Telescoping Man Lift															
Staff Cars	0%	0%	5.71	5.71	11.41	11.41	17.92%	2.05	2.05	0.10	0.10	0.19	0.19	0.03	0.03
Van Pooling	0%	0%	0.77	0.77	1.53	1.53	2.41%	0.28	0.28	0.08	0.08	0.17	0.17	0.03	0.03
Visitor Cars	0%	0%	0.12	0.12	0.95	0.95	1.49%	0.13	0.13	0.00	0.00	0.02	0.02	0.00	0.00
Operations and Maintenance Supplies truck	0%	0%	0.61	0.61	1.22	1.22	1.91%	0.04	0.04	0.07	0.07	0.15	0.15	0.00	0.00
Waste Management truck	0%	0%	5.32	5.32	10.65	10.65	16.72%	0.32	0.32	0.78	0.78	1.56	1.56	0.05	0.05
Hazardous Waste truck	0%	0%	6.39	6.39	12.78	12.78	20.06%	0.38	0.38	0.94	0.94	1.87	1.87	0.06	0.06
Transport Tractor Trailers truck	0%	0%	5.08	5.08	10.16	10.16	15.95%	0.30	0.30	0.74	0.74	1.49	1.49	0.04	0.04
Water Delivery Trucks	0%	0%	0.24	0.24	1.89	1.89	2.97%	0.34	0.34	0.03	0.03	0.28	0.28	0.05	0.05
Hydrogen Delivery Trucks	0%	0%	1.64	1.64	13.11	13.11	20.57%	0.24	0.24	0.24	0.24	1.92	1.92	0.03	0.03
TOTAL Fugitive emissions for vehicles traveled on paved road			**25.87**	**25.87**	**63.70**	**63.70**		**4.08**	**4.08**	**2.99**	**2.99**	**7.64**	**7.64**	**0.30**	**0.30**

off-site fugitive

Vehicle Type	No. Of Unit	Max Daily Distance per Vehicle (mile/day)	Max. Operating Hours / Day	Assumed distance percentage to drive on unpaved road	Assumed distance percentage to drive on paved road	Unpaved Road - PM_{10} Fugitive Emissions (lb/day)	Paved Road - PM_{10} Fugitive Emissions (lb/day)	Total PM_{10} Fugitive Emissions (lb/day)
Washing Vehicle								
LRU Maintenance Truck with Boom								
Staff & Security Truck								
Rubber-wheeled forklift with telescoping boom								
Forklift								
Telescoping Man Lift								
Staff Cars	72	74	2	0%	100%	0.00	11.41	11.41
Van Pooling	3	74	2	0%	100%	0.00	1.53	1.53
Visitor Cars	6	74	8	0%	100%	0.00	0.95	0.95
Operations and Maintenance Supplies truck	1	124	2	0%	100%	0.00	1.22	1.22
Waste Management truck	1	130	2	0%	100%	0.00	10.65	10.65
Hazardous Waste truck	1	156	2	0%	100%	0.00	12.78	12.78
Transport Tractor Trailers truck	1	124	2	0%	100%	0.00	10.16	10.16
Water Delivery Trucks	1	24	8	0%	100%	0.00	1.89	1.89
Hydrogen Delivery Trucks	1	160	8	0%	100%	0.00	13.11	13.11
						0.00	**63.70**	**63.70**

driving on-site only

TECHNICAL AREA: ALTERNATIVES

Data Request 137: Please provide an alternative configuration for Phase 1 of the proposed project that takes these concerns (donated land and Big Horn Sheep habitat) into account.

Response: Please refer to attachment ALT-6, located behind this response.

ALT-6

SOLAR ONE ORIGINAL SITE BOUNDARY

DEBRIS BASINS FOR OFFSITE FLOWS

SOLAR ONE NEW SITE BOUNDARY

PROPOSED PERIMETER FENCE

N.A.P.

PROJECT BOUNDARY

PROPOSED MAIN SERVICES COMPLEX AND STAGING AREA

ARTERIAL ROADWAY

PROPOSED WATER WELL

PHASE 1 (500 MW)

PROPOSED SOLAR ONE SUBSTATION

EXISTING SCE 220kV TRANSMISSION LINE

EXISTING SCE 500kV TRANSMISSION LINE

EXISTING BNSF RAILROAD RIGHT-OF-WAY

PROPOSED BRIDGE OVER EXISTING RAILROAD

PROPOSED PERMANENT PROJECT ACCESS ROAD (HECTOR ROAD)

EXISTING UNDERGROUND UTILITIES

PHASE 2 (250 MW)

EXISTING UNDERGROUND GAS UTILITY

EXISTING HIGHWAY 40 RIGHT-OF-WAY

EXISTING SCE PISGAH SUBSTATION

EXISTING TRANSMISSION LINE

LEGEND

- PROJECT BOUNDARY
- PROPOSED ROAD
- PROPOSED FENCE
- PHASE 1 SUNCATCHERS
- PHASE 2 SUNCATCHERS
- N.A.P. PRIVATE LAND

GRAPHIC SCALE

(IN FEET)
1 inch = 1600 ft.

PRELIMINARY
NOT FOR CONSTRUCTION
ISSUE DATE: 11-17-2009

SHEET 1 of 1

REVISION —

JOB NO. 05159706

CHECKED B. CLEMENS

DRAWN D. SEYBOLD

DESIGNED D. SEYBOLD

SHEET SIZE: 24"x36"

TITLE: SOLAR ONE EXHIBIT TWO

CLIENT: Tessera Solar

4800 N. SCOTTSDALE ROAD • SUITE 5500 SCOTTSDALE, ARIZONA 85251 PHONE (602) 442-4400 • FAX (602) 471-8418

HUITT-ZOLLARS Huitt-Zollars, Inc. Phoenix 455 N. 44TH ST. • SUITE 300 • PHOENIX, ARIZONA 85008 PHONE (602) 952-8123 • FAX (602) 952-8124

R.C.E. EXP.

APPROVED BY: DATE

REVISIONS

NO. DATE BY APP.

TECHNICAL AREA: ALTERNATIVES

Data Request 138: Please describe any possible engineering constraints that would limit or preclude the avoidance of high value resource areas within the proposed site boundaries.

Response: Excluding the Catellus parcels as well as the NAP parcels will significantly constrain the operation and design intent of the project in the following ways:

1. Sedimentary transport management at the southern boundaries of the Catellus parcels will be extremely difficult. Management design will require additional basin areas, encroaching on land that would otherwise be used for SunCatcher development.

2. Disrupted site continuity will present logistical challenges for construction and maintenance access. This will be especially difficult for parcel 4, which will require travel outside the Project boundaries.

3. Collection and distribution will require additional design, material and construction at parcel 4. Overhead collection/distribution may be needed.

4. Project generating capacity will be decreased by approximately 190 MW which will put the Project in default under the existing PPA with SCE.

SES Solar One
Responses to CEC and BLM Data Requests
Data Requests 71-73, 76-79, 85, and 128-141
08-AFC-13

TECHNICAL AREA: PROJECT DESCRIPTION

Data Request 139: Please provide information on how the hydrogen for the SES Solar One Project will be produced and delivered to the individual SunCatcher units.

Response: The Project described the hydrogen use, supply and storage in the AFC, filed December 1, 2008. The hydrogen system was described as a k-bottle of hydrogen on each Power Conversion Unit (PCU). One hydrogen gas cylinder would contain approximately 195 cubic feet of hydrogen, used to replenish lost hydrogen gas within the gas circuit. Each k-bottle was to be supported from the base of the PCU boom. Each PCU's k-bottle would either need to be removed and replaced or refilled at each dish site as required (approximately two times per year). The Applicant has reconsidered the plan for providing hydrogen to the PCUs and has adopted a hydrogen gas distribution system.

The hydrogen gas supply will be produced through electrolysis by one hydrogen generator. It is important to note that the hydrogen will not be generated from natural gas. The generator is capable of producing 1065 standard cubic feet (scf) of hydrogen per hour and requires 146 watts/scf of electricity and 2.58 cubic inches of water/scf/hour during operation. Approximately 184 gallons of water per day or 0.0133 acre feet per year will be required for this generator which will be processed through the on site Water Treatment Plant to produce Demineralized Water and fed to the electrolyzer mounted on the hydrogen generator skid. The electrolyzer will eliminate any final impurities in the water prior to processing.

The annual power consumption to meet the hydrogen production needs is 100 KW per day, or 36.64 MW per year. Although the hydrogen generator could run full time if needed to support SunCatcher hydrogen requirements, the generator will normally be operated at off-peak electric hours using grid power.

The hydrogen gas will be stored in a steel storage tank capable of storing approximately two days supply of hydrogen gas. It will be piped through a 1.5-inch stainless steel piping system to 87 individual compressor groups. Each compressor group will be electrically operated and consist of a compressor, delivering gas at approximately 2,900 psig, and a high pressure supply tank.

Initially, it will take 3.4 scf of hydrogen to charge the Stirling engine. Each Power Conversion Unit is estimated to lose about 200 scf per year. Each high pressure supply tank will supply hydrogen gas to 360 SunCatchers via a 0.25-inch stainless tubing. The tubing will be placed underground in areas already disturbed by other wiring. A low pressure dump tank will be installed with each compressor group utilizing a 0.25-inch stainless steel return line to recover hydrogen gas when the SunCatchers are not in-service. This will reduce hydrogen leaks through fittings and seals on the Stirling Engine. In the event that the hydrogen generator fails, an unloading station designed to receive and transfer hydrogen gas to the storage tank will be installed to allow for the delivery of hydrogen gas to the site by an outside supplier. The hydrogen gas storage tank will provide a few days of hydrogen supply as a back-up system. SES will complete all scheduled maintenance to the hydrogen generator, when the gas supply is adequate.

TECHNICAL AREA: PROJECT DESCRIPTION

Data Request 140: Please update any air quality modeling (if applicable) to account for changes to hydrogen delivery truck trips.

Response: The air quality modeling and impact analysis included delivery trips from bringing hydrogen gas on-site. Therefore, no additional impacts to air quality are anticipated and because the hydrogen delivery trips can be eliminated, calculated emissions are anticipated to be lower than previously presented.

TECHNICAL AREA: PROJECT DESCRIPTION

Data Request 141: Please update any traffic and transportation impacts (if applicable) to account for changes to hydrogen delivery truck trips.

Response: The traffic modeling and analysis included delivery trips from bringing hydrogen gas on-site. Therefore, no additional impacts are anticipated and because the hydrogen delivery trips can be eliminated, calculated trip numbers are anticipated to be lower than previously presented.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
For the SES SOLAR ONE PROJECT

Docket No. 08-AFC-13

PROOF OF SERVICE
(Revised 11/5/09)

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DECLARATION OF SERVICE

I, Corinne Lytle, declare that on November 23, 2009, I served and filed copies of the attached, Applicant's Responses to CEC and BLM Data Requests 71-73, 76-79, 85 and 128-141. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[www.energy.ca.gov/sitingcases/solarone]**.

The documents have been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

FOR SERVICE TO ALL OTHER PARTIES:

_____ sent electronically to all email addresses on the Proof of Service list;

_____ by personal delivery or by depositing in the United States mail at Sacramento, California with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

_____ sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

_____ depositing in the mail an original and 12 paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-13
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

Original Signed By

Corinne Lytle