**Mojave Desert Air Quality Management District**
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Eldon Heaston, Executive Director

| DOCKET |
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| 08-AFC-13 |
| DATE JAN 27 2010 |
| RECD. FEB 01 2010 |

January 27, 2010

Christopher Meyer, Project Manager
California Energy Commission
1516 Ninth Street, MS-15
Sacramento, CA 95814

**Re: Final Decision/Determination for SES Solar One Project Docket 08-AFC-13**

Dear Mr. Meyer:

The Mojave Desert Air Quality Management District (District) has completed the final decision on the proposed SES Solar One Electric Generating System to be located approximately 17 miles east of Newberry Springs mostly on public land administered by the Bureau of Land Management (BLM) California Desert District. Enclosed please find the Final Decision/Determination document, prepared pursuant to District Regulation XIII.

If you have any questions regarding this action or the enclosure, please contact Samuel J. Oktay PE, Air Quality Engineer, at (760) 245-1661, x1610.

Sincerely,

**Alan De Salvio**
Supervising Air Quality Engineer

enclosure

cc: Director, USEPA Region 9
Chief, Stationary Source Division, CARB
Will Walter, CEC Air Quality Analyst
Robert Liden, Executive VP, Stirling Energy Systems

# Final Decision/Determination
# SES Solar One Project Located approximately 37 miles east of Barstow, On An 8,230-acre site located in San Bernardino County, California

## A. Introduction

The Mojave Desert Air Quality Management District (MDAQMD) has prepared this document Pursuant to District Rule 1306, Electrical Energy Generating Facilities.

### 1. Application and Setting

The MDAQMD has received a Request for Agency Participation and Application for Certification (AFC) for the Stirling Energy Systems, Inc, **SES Solar One Project** (Solar One), **Docket 08-AFC-13, dated December 21, 2008.** Subsequently the District submitted a Notification of Intent to Participate (NOI) letter dated January 6, 2009, indicating that the MDAQMD pursuant to District Rule 1306 intended to participate in the permitting process as well as the Application for Certification (AFC) for the Project known as SES Solar One.

The Applicant intends to develop the nominal 850MW project in two phases. The 500MW Phase I of the Project will consist of approximately 20,000 SunCatcher dishes located on approximately 5,838 acres. The 350MW Phase II of the Project will consist of approximately 14,000 SunCatcher dishes located on approximately 2,392 acres. The majority of the Project will be located on public land administered by the Bureau of Land Management (BLM) California Desert District (CDD) and as such federal approval of the Project is required.

Project location is approximately 37 miles east of Barstow, 17 miles east of Newberry Springs, 57 miles northeast of Victorville, and approximately 115 miles east of Los Angeles (straight line distances); the majority of the Project is located on public land administered by the BLM California Desert District. Also see Figure 1, page 3. Elevation is approximately 1,860 feet. (See figure 1 on page 3)

SunCatcher technology is a proprietary solar dish Stirling Engine system developed by SES; this technology is non-polluting, and cost-effective in large utility-scale deployment, and consists of an approximate 38-foot high by 40-foot wide solar concentrator dish that supports an array of curved glass mirror facets. Each SunCatcher operates independently, tracks the sun automatically, and generates grid-quality electricity. Each of the SunCatchers operates with the thermal Stirling cycle principal using hydrogen gas as the thermal working fluid. These systems are self contained and include thermal engines utilizing solar radiation as their heat source; there is neither combustion nor by-products of combustion as a result of this power generation. The SunCatchers are purported to have overall efficiencies of 33 percent.

From an Air Quality Regulatory viewpoint, this project contains a minimal number of emission sources, they are: A Diesel Fueled Emergency Electrical Generator (Genset), rated at 399 bhp,

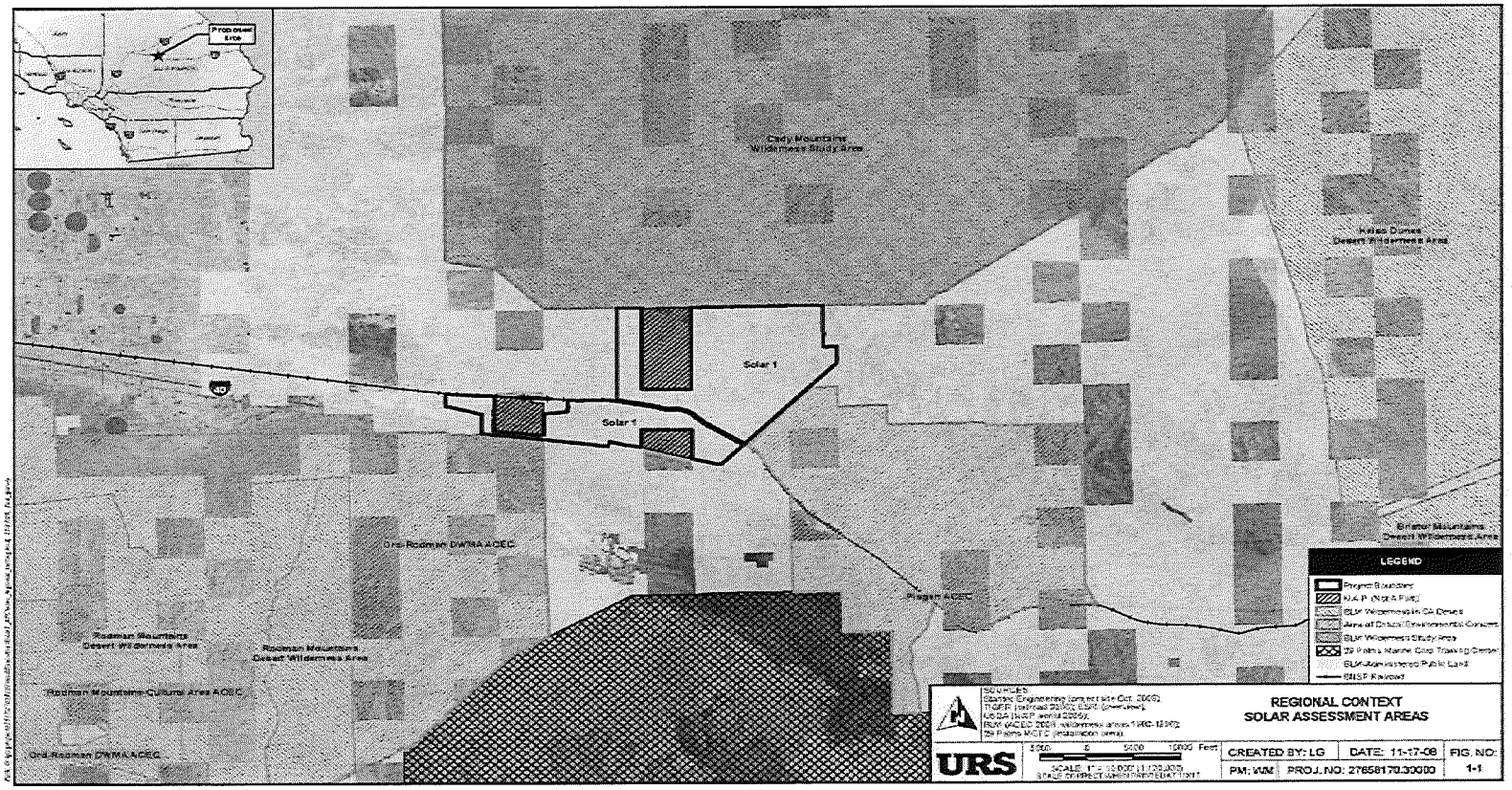
and an aboveground Gasoline Dispensing Facility (5,000 gallons). The Genset engine will be EPA Certified Tier III off-road engine (or higher Tier depending on regulatory requirements at the time of construction), considered to be the least emitting, and cleanest engine currently available for this class or category. The aboveground Gasoline Dispensing tank shall be equipped with the latest requirements for vapor recovery and standing loss requirements in affect at the time of construction as required by the California Air Resources Board (CARB); requirements shall include certified Phase I, Phase II Vapor Recovery System, and standing loss requirements. Enhanced Vapor Recovery (EVR) Phase I, and EVR Phase II in addition to standing loss requirements will be required in accordance with the EVR Timeline for Aboveground Tanks (AGT's), depending on construction timeline and CARB certifications required at that time. This AGT will be the least polluting, commercially available and cost effective equipment available. Emissions from the above ground tank and emergency generator will be minimal and far below thresholds for emission offsets.

Additionally vehicular traffic on unpaved roads will generate fugitive dust emissions. This traffic is required for various maintenance operations at the solar plant. The applicant will be mitigating these fugitive emissions to the greatest extent feasible as part of compliance with the California Energy Commission (CEC) licensing activities and the attendant California Environmental Quality Act (CEQA) process. The MDAQMD will not be directly involved with those negotiations, but will monitor the project through the certification process.

The majority of emission from this facility will occur as a result of grading and earth moving operations and subsequent maintenance of the 34,000 SunCatcher dish array. The maintenance roads will not be paved, but will be treated with soil stabilizers and water to minimize particulate (dust) emissions that will occur during maintenance operations. Emissions will be mitigated through CEQA, as per agreements between the applicant and the CEC, which is the Lead agency for projects of this type.

The MDAQMD will require the applicant to comply with all applicable MDAQMD rules and regulations, including but not necessarily limited to: Rule 401, Visible Emissions; Rule 402, Nuisance; Rule 403.2, Fugitive Dust Control for the Mojave Desert Planning Area, and Rule 405 Solid Particulate Matter – Weight. In particular Rule 403.2(C) Requirements, which summarizes specific requirements as they would apply to grading, earth moving and piling operations.

Figure 1: Solar One Site Location



## 2. Intent to Participate- Preliminary Report (Rule 1306B(2))

On January 6, 2009, pursuant to District Rule 1306(B)(2)(b), the MDAQMD submitted a NOI letter. Additionally, the District will summarize any Best Available Control Technology (BACT) requirements, and provide an assessment as to whether this project will meet the requirements of District Regulation XIII and all other Rules and Regulations of the MDAQMD, including a preliminary list of operating conditions.

## B. Laws, Ordinances, Regulations, and Standards (LORS)

Requirements of federal, state, and local jurisdictions are discussed herein, including a discussion regarding Compliance of the applicable requirements.

The U.S. Environmental Protection Agency (EPA) implements and enforces the requirements of many of the federal environmental laws. EPA Region 9, which has offices in San Francisco, administers federal air programs in California. The federal Clean Air Act, as most recently amended in 1990, provides EPA with the legal authority to regulate air pollution from stationary sources such as Solar One. EPA has promulgated the following stationary source regulatory programs to implement the requirements of the federal Clean Air Act:

- Prevention of Significant Deterioration (PSD)
- New Source Review (NSR)
- Title IV: Acid Rain Program
- Title V: Operating Permits
- National Standards of Performance for New Stationary Sources (NSPS)
- National Emission Standards for Hazardous Air Pollutants (NESHAPs)

## 1. Prevention of Significant Deterioration (PSD) Program Authority:

Clean Air Act §160-169A, 42 USC §7470-7491; 40 CFR Parts 51 and 52

[Although this program is normally implemented at the local level with federal oversight, it is presently implemented in the MDAQMD by EPA Region IX]

Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to prevent significant deterioration of ambient air quality. PSD applies to pollutants for which ambient concentrations do not exceed the corresponding National Ambient Air Quality Standards (NAAQS) (i.e., attainment pollutants). The PSD program allows new sources of air pollution to be constructed, or existing sources to be modified, while preserving the existing ambient air quality levels, protecting public health and welfare, and protecting Class I areas (e.g., national parks and wilderness areas).

Nonetheless the SES Solar One facility will not be a major stationary source, and therefore, is not subject to the PSD program.

## 2. New Source Review Authority:

Clean Air Act §171-193, 42 USC §7501 et seq.; 40 CFR Parts 51 and 52
Requires pre-construction review and permitting of new or modified major stationary sources of air pollution to allow industrial growth without interfering with the attainment and maintenance of NAAQS.

New source review jurisdiction has been delegated to the MDAQMD.

### 3. Acid Rain Program Authority:

Clean Air Act §401 (Title IV), 42 USC §7651
Requires the monitoring and reporting of emissions of acidic compounds and their precursors. The principal source of these compounds is the combustion of fossil fuels. Therefore, Title IV established national standards to monitor, record, and in some cases limit emissions of sulfur dioxide (SO2) and oxides of nitrogen (NOx) from electrical power generating facilities. These standards are implemented at the local level with federal oversight.

Title IV does not apply to the SES Solar One facility, because there are no combustion sources associated with power generation; power generation occurs with solar thermal energy production.

Administering Agency is the MDAQMD, with EPA Region 9 oversight.

### 4. Title V Operating Permits Program Authority:

Clean Air Act §501 (Title V), 42 USC §7661
Requires the issuance of operating permits that identify all applicable federal performance, operating, monitoring, recordkeeping, and reporting requirements. Title V applies to major facilities, Phase II Acid Rain facilities, subject solid waste incinerator facilities, and any facility listed by EPA as requiring a Title V permit.

EPA has delegated authority for this program to MDAQMD.

Emissions from the **SES Solar One** are below Title V applicability threshold, therefore SES Solar One is not subject to the Title V Operating Permits Program.

Administering Agency is the MDAQMD, with EPA Region 9 oversight.

### 5. National Standards of Performance for New Stationary Sources Authority:

Clean Air Act §111, 42 USC §7411; 40 CFR Part 60
Establishes standards of performance to limit the emission of criteria pollutants (air pollutants for which EPA has established NAAQS) from new or modified facilities in specific source categories. These standards are implemented at the local level (MDAQMD) with federal oversight. The applicability of these regulations depends on the equipment size, process rate, and/or the date of construction, modification, or reconstruction of the affected facility. NSPS

Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines is applicable to the emergency engine.

Administering Agency is the MDAQMD, with EPA Region 9 oversight.

## 6. National Emission Standards for Hazardous Air Pollutants

**Authority:** Clean Air Act §112, 42 USC §7412
Establishes national emission standards to limit emissions of hazardous air pollutants (HAPs, or air pollutants identified by EPA as causing or contributing to the adverse health effects of air pollution, but for which NAAQS have not been established) from major sources of HAPs in specific source categories. These standards are implemented at the local level (MDAQMD) with federal oversight. As discussed below, **SES Solar One** will not a major source of HAPS, and is not subject to NESHAPs.

Administering Agency is the MDAQMD, with EPA Region 9 oversight.

## 7. Consistency with Federal Requirements

The MDAQMD has been delegated authority by the EPA to implement and enforce most federal requirements applicable to the project, including new source performance standards and new source review for nonattainment pollutants. Compliance with the MDAQMD regulations assures compliance and consistency with the corresponding federal requirements. The project would also be required to comply with the Federal Acid Rain requirements (Title IV). The MDAQMD has delegated authority to implement Title IV through its Title V permit program; **SES Solar One** does not require a Title V Federal Operating Permit.

## 8. State LORS

The California Air Resources Board (CARB) was created in 1968 by the Mulford-Carrell Air Resources Act, through the merger of two other state agencies. CARB's primary responsibilities are to develop, adopt, implement, and enforce the state's motor vehicle pollution control program; to administer and coordinate the state's air pollution research program; to adopt and update, as necessary, the California Ambient Air Quality Standards (CAAQS); to review the operations of the local air pollution control districts (APCDs); and to review and coordinate preparation of the State Implementation Plan (SIP) for achievement of the NAAQS. CARB has implemented the following state or federal stationary source regulatory programs in accordance with the requirements of the federal Clean Air Act and California Health and Safety Code (H&SC):

- State Implementation Plan
- California Clean Air Act
- Toxic Air Contaminant Program
- Airborne Toxic Control Measure for Stationary Compression-Ignition Engines
- Nuisance Regulation
- Air Toxics "Hot Spots" Act
- California Energy Commission (CEC) and CARB Memorandum of Understanding

## 9. State Implementation Plan

**Authority:** H&SC §39500 et seq.
The State Implementation Plan (SIP) demonstrates the means by which all areas of the state will attain and maintain NAAQS within the federally mandated deadlines, as required by the federal Clean Air Act. CARB reviews and coordinates preparation of the SIP. Local districts must adopt new rules or revise existing rules to demonstrate that resulting emission reductions, in conjunction with reductions in mobile source emissions, will result in attainment of the NAAQS. The relevant MDAQMD Rules and Regulations that have also been incorporated into the SIP are discussed in the local LORS section of this document.

Administering Agency is the MDAQMD, with CARB and EPA Region 9 oversight.

## 10. California Clean Air Act

**Authority:** H&SC §40910 – 40930
Established in 1989, the California Clean Air Act requires local districts to attain and maintain both national and state ambient air quality standards at the "earliest practicable date." Local districts must prepare air quality plans demonstrating the means by which the ambient air quality standards will be attained and maintained. The relevant components of the MDAQMD Air Quality Plan are discussed within the local LORS section of this document.

Administering Agency is the MDAQMD, with CARB oversight.

## 11. Toxic Air Contaminant Program

**Authority:** H&SC §39650 – 39675
Established in 1983, the Toxic Air Contaminant Identification and Control Act created a two-step process to identify toxic air contaminants (TACs) and control their emissions. CARB identifies and prioritizes the pollutants to be considered for identification as toxic air contaminants. CARB assesses the potential for human exposure to a substance, while the Office of Environmental Health Hazard Assessment evaluates the corresponding health effects. Both agencies collaborate in the preparation of a risk assessment report, which concludes whether a substance poses a significant health risk and should be identified as a toxic air contaminant. In 1993, the Legislature amended the program to include the federally identified HAPs as toxic air contaminants. CARB reviews the emission sources of an identified toxic air contaminant and, if necessary, develops air toxics control measures to reduce the emissions.

Administering Agency is CARB

## 12. Airborne Toxic Control Measure for Stationary Compression-Ignition Engines

**Authority:** Title 17, California Code of Regulations, §93115
The purpose of this airborne toxic control measure (ATCM) is to reduce diesel particulate matter (DPM) and criteria pollutant emissions from stationary diesel-fueled compression ignition

engines. The ATCM applies to stationary compression ignition engines with a rating greater than 50 brake horsepower. The ATCM requires the use of CARB-certified diesel fuel or equivalent, and limits emissions from, and operations of, compression ignition engines.

Administering Agency is MDAQMD and CARB

### 13. Nuisance Regulation

**Authority:** CA Health and Safety Code §41700
Provides that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property."

Administering Agency is MDAQMD and CARB

### 14. Air Toxic "Hot Spots" Act

**Authority:** H& SC §44300-44384; 17 CCR §93300-93347
Established in 1987, the Air Toxics "Hot Spots" Information and Assessment Act supplements the toxic air contaminant program, by requiring the development of a statewide inventory of air toxics emissions from stationary sources. The program requires affected facilities to prepare (1) an emissions inventory plan that identifies relevant air toxics and sources of air toxics emissions; (2) an emissions inventory report quantifying air toxics emissions; and (3) a health risk assessment, if necessary, to characterize the health risks to the exposed public. Facilities whose air toxics emissions are deemed to pose a significant health risk must issue notices to the exposed population. In 1992, the Legislature amended the program to further require facilities whose air toxics emissions are deemed to pose a significant health risk to implement risk management plans to reduce the associated health risks. This program is implemented at the local level with state oversight.

Administering Agency is the MDAQMD with CARB oversight.

### 15. CEC (California Energy Commission) and CARB Memorandum of Understanding

**Authority:** CA Pub. Res. Code §25523(a); 20 CCR §1752, 1752.5, 2300-2309 and Div. 2, Chap. 5, Art. 1, Appendix B, Part (k)
Provides for the inclusion of requirements in the CEC's decision on an Application For Certification (AFC) to assure protection of environmental quality; thus the AFC is required to include information concerning air quality protection.

Administering Agency is the CEC

### 16. Consistency with State Requirements

State law established local air pollution control districts and air quality management districts with the principal responsibility for regulating emissions from stationary sources. **SES Solar One** is under the local jurisdiction of the MDAQMD, and compliance with MDAQMD regulations will assure compliance with state air quality requirements.

## 17. Local LORS

When the state's air pollution statutes were reorganized in the mid-1960s, local districts were required to be established in each county of the state. There are three different types of districts: county, regional (including the MDAQMD), and unified. In addition, special air quality management districts (AQMDs), with more comprehensive authority over non-vehicular sources, as well as transportation and other regional planning responsibilities, have been established by the Legislature for several regions in California. Local districts have principal responsibility to do the following:

- Develop plans for meeting the NAAQS and California ambient air quality standards;
- Develop control measures for non-vehicular sources of air pollution necessary to achieve and maintain both state and federal air quality standards;
- Implement permit programs established for the construction, modification, and operation of sources of air pollution;
- Enforce air pollution statutes and regulations governing non-vehicular sources; and
- Develop programs to reduce emissions from indirect sources.

Under the regulations that govern new sources of emissions, the project is required to secure a preconstruction Determination of Compliance from the MDAQMD, as well as demonstrate continued compliance with regulatory limits when the new equipment becomes operational. The preconstruction review includes demonstrating that the diesel fueled engine, and gasoline dispensing equipment will use best available control technology (BACT), if required, and will provide any necessary emission offsets.

This document fulfils the requirements of that pre-construction review.

## 18. Mojave Desert Air Quality Plans

**Authority:** H&SC §40914
Air quality plans define the proposed strategies, including stationary source and transportation control measures and new source review rules that will be implemented to attain and maintain the state ambient air quality standards. The relevant stationary source control measures and new source review requirements are discussed with MDAQMD Rules and Regulations.

Administering Agency is the MDAQMD with EPA Region 9 and CARB oversight.

## 19. Mojave Desert Air Quality Management District Rules and Regulations

**Authority:** H&SC §4000 et seq., H&SC §40200 et seq., indicated MDAQMD Rules Establishes procedures and standards for issuing permits; establishes standards and limitations on a source-specific basis.

Administering Agency is the MDAQMD with EPA Region 9 and CARB oversight.

## 20. Authority to Construct

Regulation II—Permits, Rule 201 (Permit to Construct) specifies that any facility installing nonexempt equipment that causes or controls the emission of air pollutants must first obtain an Authority to Construct from the MDAQMD. Under Regulation XIII Rule 1306 (Electric Energy Generating Facilities) Section (E)(3)(b), the District's Final Determination of Compliance acts as an authority to construct for a power plant upon approval of the project by the CEC.

The MDAQMD will issue District approved ATC permits approximately after the Final Determination of Compliance (FDOC) is accepted by the CEC.

## 21. Review of New or Modified Sources

Regulation XIII (New Source Review) implements the federal NSR and PSD programs, as well as the new source review requirements of the California Clean Air Act. The rule contains the following elements:
- BACT and Lowest Achievable Emission Rates (LAER)
- Emission offsets
- Air quality impact analysis (AQIA)

## 22. Best Available Control Technology (BACT)

BACT must be applied to any new or modified source which has a potential to emit 25 pounds per day or more of any Nonattainment Air Pollutant. The Nonattainment Air Pollutants are ozone and its precursors NOx and volatile organic compounds (VOC), and particulate matter (PM10) and its precursors NOx, SOx, and VOC.

The MDAQMD defines BACT (Rule 1301(K)(2)) for a non-major facility as the most stringent emission limitation or control technique that:
- Has been achieved in practice for the category or class of source; or
- Is any emission limitation or control technique determined to be technologically feasible and cost-effective; or
- Is contained in any SIP approved by EPA for such emission unit category, unless demonstrated to not be proven in field application, not be technologically feasible, or not be cost-effective.

The emergency electrical Genset does have a potential to emit above BACT thresholds, and will meet MDAQMD BACT requirements.

The aboveground tank emissions are well below BACT threshold; nonetheless, this tank shall meet BACT requirements also.

## 23. Emission Offsets

A new or modified source resulting in emission increases above the thresholds shown in the table below must offset emission increases of nonattainment pollutants (and their precursors). Table 1 shows that the non-fugitive emission increases from the Solar One SEGS are all below offset thresholds. Therefore, no offsets are required under District regulations.

**TABLE 1** MDAQMD Offset Emission Thresholds

| Pollutant | Offset Threshold* (tpy) | SES Solar One Project Annual Emissions (tpy) | Offsets Required? |
|---|---|---|---|
| CO | 100 | **0.0** | **No** |
| Hydrogen Sulfide | 10 | **0.0** | **No** |
| Lead | 0.6 | **0.0** | **No** |
| PM10 | 15 | **0.0** | **No** |
| NOx | 25 | **0.1** | **No** |
| SOx | 25 | **0.0** | **No** |
| VOC | 25 | **0.0** | **No** |

* MDAQMD Regulation XIII, Rule 1303 (B)(1)

## 24. Toxic Risk Management

Regulation XIII, Rule 1320 (New Source Review for Toxic Air Contaminants) provides a mechanism for evaluating the potential impact of toxic air contaminant (TAC, also called non-criteria pollutants) air emissions from new, modified, and relocated sources in the MDAQMD. The rule imposes more stringent requirements on sources with higher risks, as shown in Table 3.

## 25. BACT Requirements

This facility is primarily a Solar Energy powered power plant, and as proposed, the emissions associated with the emergency electrical generation, and gasoline dispensing equipment will be minimal. Nonetheless, District Rule 1306 requires the District to make a BACT assessment to all Electrical Energy Generating Facility's (EEGF's) proposed in the District. Pursuant to this requirement, the District has calculated the proposed equipment emissions and found that based on the emission factors supplied by the applicant and the daily operating hours of the emission producing equipment, BACT thresholds of 25 lbs/day is triggered by the Diesel fired Genset; the applicant has committed to the purchase of Tier III off-road Diesel Powered Genset, or higher Tier, lowest polluting engine required at time of construction, and meets BACT requirements. The Gasoline Dispensing equipment will also be BACT equipped, as it will be in compliance with a CARB certified executive order for Phase I and Phase II vapor recovery, or Enhanced Vapor Recovery (EVR) Phase I and EVR Phase II along with standing loss requirements as required at the time of construction.

The following tables summarize the expected emissions from the proposed equipment:

**TABLE 2: 399 BHP Genset Emissions (Attachment 1):**

| Emissions | | Normal Operation Testing and Maint. Hrs/Year | Normal Operation for Testing and Maintenance Hrs/Day | Max Daily PTE (pounds) | | | | Max Annual (pounds) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| *App No.* | *Equipment* | | | NOX | SOX | CO | PM | NOX | SOX | CO | PM |
| 000104233 | 399 BHP Tier III Genset | *50* | *1* | 2.5 | 0.0 | 2.1 | 0.1 | 123.4 | 0.2 | 106.9 | 6.2 |
| | | | | | | | TPY | 0.1 | 0.0 | 0.1 | 0.0 |

*Emission Factors (g/bhp-hr)
NOX + HC: 3.0
(Oxides of Nitrogen as NO2 + Total Unburned Hydrocarbons)
SOX: 0.005
CO: 2.60
PM: 0.15

*Emission Factors from applicant supplied EPA Tier 3 Exhaust Emission Complaince Statement (Attachment 2)

**TABLE 3: Aboveground Tank Emissions: Emissions (Attachment 3)**

| | | Hrs/Year | Throughput GPY | Pollutant Max Daily PTE (pounds) | | Max Annual | |
|---|---|---|---|---|---|---|---|
| *App No.* | *Equipment* | | | TOG | Total Toxic Compounds | TOG (TPY) | Total Toxic Compounds (Lbs/yr) |
| '00010422 | AGT per CARB EO G-70-200B | 8760 | 50,000 | 0.21 | 0.008 | 0.038 | 2.90 |

*Criteria Emission Factors (Lbs/1000 gallons)
Aboveground tank with Phase I and II, with Vent Valves 90% Overall Efficiency for Breathing and Refueling; TOG: 1.52 Lbs/1000 gallons

*Toxic Substances Emission Factors (Lbs/1000 gallons)

| | |
|---|---|
| Benzene: | 0.0075 |
| Ethylbenzene: | 0.0067 |
| Toluene: | 0.0336 |
| Xylene: | 0.0101 |
| Total | 0.0579 |

*Source: CAPCOA Air Toxics "Hot Spots" Program 1997, Appendix A;
http://www.arb.ca.gov/ab2588/rrap-iwra/GasIWRA.pdf

## C. Air Quality

For purposes of state and federal air quality planning, the MDAQMD is in attainment for NO2, SO2, and CO with respect to both state and national standards. The eastern portion of San Bernardino County (including the project site) has been designated by USEPA as "nonattainment" for the federal and state ozone standards. San Bernardino County is also nonattainment for the federal PM10 and state PM10 standard.

## D. Renewable Energy

Solar One SEGS will assist California in repositioning its generation asset portfolio to use more renewable energy and reduce greenhouse gas (GHG) emissions in conformance with state policies as set forth in SB 1078 and AB 32. It will help meet the 20 percent renewable goal in general, but not by the 2010 deadline, and help meet the recommended 33 renewable goal by 2020. Additionally, it will help diversify the state's electricity sources, reducing its dependence on natural gas-fired power.

## E. Particulate Emission Control

Particulate emissions will be controlled by the use of best Particulate emissions from the diesel fueled Internal Combustion powered emergency generator is minimized through the use of an engine that meets CARB's diesel Air Toxics Control Measure (Diesel ATCM). The applicant's Diesel engine will meet this requirement.

There are no particulate emissions from the aboveground gasoline tank.

The primary source of emissions will be fugitive, and primarily a result of grading and earth moving operations, and later as a result of maintenance operations associated with the mirrored array.

The applicant will be mitigating these fugitive emissions to the greatest extent feasible through cooperation with the California Energy Commission and the CEQA process. The MDAQMD will not be directly involved with those negotiations, but will monitor the project through the certification process.

## F. CEC Review

Regulation XIII, Rule 1306 establishes a procedure for coordinating MDAQMD review of power plant projects with the CEC's AFC. Under this rule, the MDAQMD reviews the AFC and issues a Determination of Compliance for a proposed project. Once CEC approves the Determination of Compliance, the MDAQMD will issue Authority to Construct (ATC) permits, subsequently the Owner/Operator may begin constructing and installing equipment permitted by the MDAQMD, as referenced in the Determination of Compliance (DOC).

## G. APPLICABLE MDAQMD RULES & REGULATIONS

### 1. MDAQMD Regulation II — *Permits*

**Rule 201 – *Permit to Construct***

States that a person shall not erect, install, alter or replace any equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce or control the issuance of air contaminants without first obtaining written authorization for such construction from the Air Pollution Control Officer. *The applicant has submitted all required applications.* Furthermore, District Rule 1306 - *Electric Energy Generating Facilities* Section (E)(3)(b), states that the District's Final Determination of Compliance acts as an authority to construct for a power plant upon approval of the project by the CEC.

**Rule 203 – *Permit to Operate***
States that a person shall not operate or use any equipment, the use of which may cause the issuance of air contaminants or the use of which may reduce or control the issuance of air contaminants, without first obtaining a written permit from the Air Pollution Control Officer or except as provided in Rule 202. The equipment shall not be operated contrary to the conditions specified in the permit to operate. *The applicant has submitted all required applications, and shall operate the affected equipment in compliance with permit conditions.*

**Rule 221 – *Federal Operating Permit Requirement***
Requires certain facilities to obtain Federal Operating Permits. *This facility is below title V thresholds and therefore a Title V is not required.*

**2. MDAQMD Regulation IV— *Prohibitory Rules***
The general prohibitory rules in Regulation IV applicable to the project include the following:

**Rule 401 - *Visible Emissions***
Prohibits visible emissions as dark as, or darker than, Ringelmann No. 1 for periods greater than three minutes in any hour.

*The proposed diesel fired emergency engines will be required to meet the highest available off-road EPA Tier engine rating standards, and to only burn California diesel fuel, not to exceed 15 ppm sulfur content. Along with proper operation, and maintenance, the visible emissions from these engines are not expected to exceed the visible emission standards.*

**Rule 402 - *Nuisance***
Prohibits the discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

*The Solar One facility shall not emit odorous pollutants, and is expected to comply with this rule.*

**Rule 403 - *Fugitive Dust***
Prohibits visible dust emissions off property due to transport, handling, construction, or storage activity. Requires dust minimization during grading and clearing of land. Limits the difference

between upwind and downwind PM concentrations of 100 µg/cubic meter (5-hour average); requires removal of particulate matter from equipment prior to movement on paved streets.

*Construction and maintenance emission mitigation measures including the use of water and/or dust suppressant materials will be required to ensure compliance with this requirement.*

**Rule 403.2 - *Fugitive Dust Control for the Mojave Desert Planning Area***
*The project lies outside the Mojave Desert Planning Area.*

**Rule 404 - *Particulate Matter Concentration***
Prohibits PM emissions in excess of the concentration referenced at standard conditions, shown in Table 404(a).

*The proposed PM10 emission rate for the engines will limit PM emissions to less than 0.05 gr/dscf.*

*The affected equipment is expected to comply with the requirements of this rule.*

**Rule 405 - *Solid Particulate Matter Weight***
A person shall not discharge into the atmosphere from any source, solid particulate matter including lead and lead compounds, in excess of the rate shown in Table 405 (a).

*The Solar One facility is expected to operate in compliance with this rule.*

**Rule 406 - *Specific Contaminants***
Prohibits sulfur emissions, calculated as SO2, in excess of 0.05 percent by volume (500 parts per million by volume [ppmv]), and acid gas emissions above specified levels.

The Solar One facility is expected to operate be in compliance with this rule.

**Rule 407 - *Liquid and Gaseous Air Contaminants***
Prohibits carbon monoxide emissions in excess of 2,000 ppmv.

*The Solar One facility is expected to operate be in compliance with this rule, the CO emissions from the diesel fuel engine will be well below 2,000 ppmv.*

**Rule 431 - *Sulfur Content of Fuels***
Prohibits the burning of gaseous fuel with a sulfur content of more than 800 ppm and liquid fuel with a sulfur content of more than 0.5 percent sulfur by weight.

The diesel ATCM and the emergency Genset operating permit require that the engine use fuel that is CARB certified ultra-low sulfur diesel (0.0015% Sulfur).

*The requirement of CARB ultra-low sulfur diesel fuel will ensure compliance with this rule.*

**Rule 475 - *Electric Power Generating Equipment***

Not applicable; the emergency generator is far below applicability thresholds and the Solar Electrical Power Plant does not emit any products of combustion, as the Sterling Engines are solar heat engines that are not powered by combustion by rather by the expansion of hydrogen gas heated by solar radiation.

**Rule 476 - *Steam Generating Equipment***
Not applicable; there is no steam generation equipment proposed for this power plant.

**3. MDAQMD Regulation IX Rule 900— *Standards of Performance for New Stationary Sources***
Not applicable

**4. MDAQMD Regulation XI— Source Specific Standards**
Not applicable

***Rule 1160—Internal Combustion Engines***
Not applicable

**5. MDAQMD Regulation XII—Federal Operating Permits**
Not applicable

**6. MDAQMD Regulation XII Rule 1210—Acid Rain Provisions of Federal Operating Permits**
Not applicable

**7. MDAQMD Regulation XIII —New Source Review**

**Rule 1306 - *Electric Energy Generating Facilities***
This Rule establishes the preconstruction review process for all EEGF proposed to be constructed in the District and for which an NOI or AFC has been accepted by the CEC, as such terms are defined in MDAQMD District Rule 1301(T), (OO), (H) and (M) respectively.

*The Mojave Desert Air Quality Management District (District) received an Application for the proposed Solar One Solar Electric Generating Station Power Project (Solar One SEGS) on December 21, 2008. Subsequently the District submitted a Notification of Intent to Participate (NOI) letter dated January 6, 2009, indicating the Mojave Desert AQMD (MDAQMD) has Intent to Participate (ITP) in the permitting process as well as the Application for Certification (AFC) for the Project known as Solar One Solar Electric Generating System (SEGS), pursuant to District Rule 1306.*

**This document will serve as the Final report pursuant to Rule 1306, as it includes the necessary elements:**

(i) A determination whether the proposed EEGF meets the requirements of this Regulation and all other applicable District Rules; and
(ii) What permit conditions will be required, including the specific BACT requirements.

## 8. MDAQMD Regulation XX — Conformity

**Rule 2002 – *General Federal Actions Conformity***

***Conformity Impacts***
A project is non-conforming if it conflicts with or delays implementation of any applicable attainment or maintenance plan. A project is conforming if it complies with all applicable District rules and regulations, complies with all proposed control measures that are not yet adopted from the applicable plan(s), and is consistent with the growth forecasts in the applicable plan(s) (or is directly included in the applicable plan). Conformity with growth forecasts can be established by demonstrating that the project is consistent with the land use plan that was used to generate the growth forecast. An example of a non-conforming project would be one that increases the gross number of dwelling units, increases the number of trips, and/or increases the overall vehicle miles traveled in an affected area (relative to the applicable land use plan).

Rule 2002 applies to this project and the determination and conformance will be provided by the Bureau of Land Management in the joint CEC/BLM CEQA/National Environmental Policy Act (NEPA) document for this project.

At present the Mojave Desert AQMD has the following Air Quality Attainment Status. The impacts from this project are NOT expected to negatively impact any current status, attainment plan, nor contribute to a change in the Attainment Status for attainment pollutants.

**MDAQMD Federal Attainment Status**
- Moderate Nonattainment for Ozone (Eight-hour Ozone (Federal 84 ppb))
- Moderate Nonattainment for Particulate Matter (PM)
- Attainment/Unclassified for PM2.5
- Attainment for CO
- Attainment for Lead (Pb)
- Attainment/Unclassified for Nitrogen Dioxide
- Attainment/Unclassified for Sulfur Dioxide

## 9. Prevention of Significant Deterioration (PSD)
MDAQMD does not have a rule that implements the federal PSD program, and has not been delegated authority; nonetheless, PSD requirements apply, on a pollutant-specific basis, to any project that is a new major Stationary source or a major modification to an existing major stationary source. District Rule 1310 Federal Major Facilities and Federal Major Modifications defines threshold amounts for new federal major sources (Rule 1310(D) table 1), as well as threshold amounts for federal major modifications (Rule 1310 (D) table 2). The PSD requirements also apply to any project expected to have a significant impact upon Class I or Class II areas or significant emissions of non-criteria pollutants. PSD includes the following elements:
- Air quality monitoring
- BACT
- Air quality impact analysis

• Protection of Class I areas including visibility impacts

*The project will not result in emissions exceeding the applicable PSD thresholds; Solar One SEGS **will not** be a "major facility", as defined in the PSD regulations.*

## L. Air Quality Setting, Climate and Meteorology

The project site is located in an area that is designated State and Federal non-attainment for ozone, and PM-10 particulate matter.

The Project will be constructed on approximate 8,230-acre site located in San Bernardino County, California, it is approximately 37 miles east of Barstow, 17 miles east of Newberry Springs, 57 miles northeast of Victorville, and approximately 115 miles east of Los Angeles (straight line distances); the majority of the Project is located on public land administered by the BLM CDD. Also see Figure 1, page 3. Elevation is approximately 1,860 feet.

Nearby Newberry Springs has a population of approximately 4,432. The area experiences about 4 inches rainfall, and 1 inch of snow per year. There are 285 days of Sunny Days, and 23 precipitation days. The July average temperature is 104°F, and the average January temperature is 36°F. Newberry Springs is a 117-square-mile (300 $km^2$) unincorporated area of San Bernardino County, California, United States. Interstates 15 and 40 cross Newberry Springs along with the historic U.S. Route 66.

## N. Air Quality Impact Analysis

The air quality impacts from this project are considered negligible and as such no modeling is required or necessary; Solar One operating emissions will not cause or contribute to violations of state or federal air quality standards.

## O. PSD Increment Consumption

The PSD program allows emission increases (increments of consumption) that do not result in significant deterioration of ambient air quality in areas where criteria pollutants have not exceeded the NAAQS.

The project is not subject to PSD review since the emissions from this source are considered negligible.

## P. Screening Health Risk Assessment (SHRA)

Results indicate that acute and chronic health hazard indices are well below 1.0, and hence, are not significant. The Health Risk Assessment for gasoline dispensing is conservatively estimated to be 0.45 in one million; well below ten in one million.

In conclusion, the project will not pose a significant health risk at any location, under any weather conditions, under any operating conditions.

## Q. Class I Area Visibility Protection

The closest Class I Area is the Joshua Tree National Park, which is approximately 75 miles to the southeast of the project location; Rule 1302(B)(v)(a) Class I Area Visibility Protection states that:

An application for a Major Facility or a Facility with a Major Modification which is located within 60 miles of a Class I Area, as defined in 40 CFR 51.301(o), shall include in its application an analysis of any anticipated impacts on visibility within that Class I Area. Such analysis shall include, but is not limited to, an analysis of the factors found in 40 CFR 51.301(a).

Since this facility is located 75 miles from the Class I Area this analysis is not required.

## R. MDAQMD Permit Conditions

CONDITIONS APPLICABLE TO SOLAR ONE EMERGENCY GENERATOR, MDAQMD APPLICATION NUMBER; 00010423, consisting of:

Cummins, Model QSL9-G3 NR3, which is a CARB Certified Tier III engine, serial number unknown, Year of manufacture unknown, 399 bhp, Direct Injected, Turbo Charged, operating at a maximum of 1800 rpm, fueled on CARB diesel, with a maximum fuel consumption rate of 19.2 gph, powering an electrical generator.

1. Engine may operate in response to notification of impending rotating outage if the area utility has ordered rotating outages in the area where the engine is located or expects to order such outages at a particular time, the engine is located in the area subject to the rotating outage, the engine is operated no more than 30 minutes prior to the forecasted outage, and the engine is shut down immediately after the utility advises that the outage is no longer imminent or in effect.

2. This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 0.0015% (15ppm) on a weight per weight basis per CARB Diesel or equivalent requirements.

3. This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit.

4. A non-resettable four-digit (9,999) hour timer shall be installed and maintained on this unit to indicate elapsed engine operating time.

5. This unit shall be limited to use for emergency power, defined as in response to a fire or when commercially available power has been interrupted. In addition, this unit shall be operated no more than 50 hours per year, and no more than 0.5 hours per day for testing and maintenance, excluding compliance source testing. Time required for source testing will not be counted toward the 50 hour per year limit.

6. The o/o shall maintain an operations log for this unit current and on-site (or at a central location) for a minimum of five (5) years, and this log shall be provided to District, State and Federal personnel upon request. The log shall include, at a minimum, the information specified below:
a. Date of each use and duration of each use (in hours);
b. Reason for use (testing & maintenance, emergency, required emission testing);
c. Calendar year operation in terms of fuel consumption (in gallons) and total hours; and,
d. Fuel sulfur concentration (the o/o may use the supplier's certification of sulfur content if it is maintained as part of this log).

7. This genset is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115). In the event of conflict between these conditions and the ATCM, the more stringent requirements shall govern.

8. This unit shall not be used to provide power during a voluntary agreed to power outage and/or power reduction initiated under an Interruptible Service Contract (ISC); Demand Response Program (DRP); Load Reduction Program (LRP) and/or similar arrangement(s) with the electrical power supplier.

CONDITIONS APPLICABLE TO SOLAR ONE ABOVEGROUND NON-RETAIL GASOLINE DISPENSING FACILITY, MDAQMD APPLICATION NUMBER; 00010422, consisting of:

An Oldcastle Aboveground Below-Grade Fuel Vault with Balance Vapor Recovery System and Buried Vapor Return Piping, 5,000 gallon capacity.

1. The toll-free telephone number that must be posted is 1-800-635-4617.

2. The owner/operator (o/o) shall maintain a log of all inspections, repairs, and maintenance on equipment subject to Rule 461. Such logs or records shall be maintained at the facility for at least two (2) years and shall be available to the District upon request.

3. Any modifications or changes to the piping or control fitting of the vapor recovery system require prior approval from the District.

4. The vapor vent pipes are to be equipped with pressure relief valves.

5. The o/o shall perform the following tests within 60 days of construction completion and annually thereafter in accord with the following test procedures:
a. Static Pressure Decay Test per CARB test method TP-201.3B (2-inch test);
b. Dynamic Back Pressure test per TP-201.4;
c. Liquid Removal Test (if applicable) per TP-201.6;
d. Fuel dispensing rate not to exceed 10 gpm, verified per EO G-70-200-C Exhibit 4, and;
e. Emergency vents and manways shall be leak free when tested at the operating pressure of the tank in accordance with CARB test methods, as specified in Title 17, California Code of Regulations.

The District shall be notified a minimum of 10 days prior to performing the required tests with the final results submitted to the District within 30 days of completion of the tests.

The District shall receive passing test reports no later than six (6) weeks prior to the expiration date of this permit.

6. The annual throughput of gasoline shall not exceed 500,000 gallons per year. Throughput Records shall be kept on site and available to District personnel upon request. Before this annual throughput can be increased the facility may be required to submit to the District a site specific Health Risk Assessment in accord with a District approved plan. In addition public notice and/or comment period may be required.

7. The o/o shall; install, maintain, and operate this equipment in compliance with CARB Executive Order G-70-200-C or Enhanced Vapor Recovery (EVR) Phase I and EVR Phase II, and Standing Loss requirements in affect at the time of construction.

## S. Public Comment and Notifications

1. Public Comment

This preliminary decision/determination was released for public comment and publicly noticed on or about June 11, 2009. No written comments were received. Final permits (Authorities to Construct) shall be prepared approximately 15 days after the California Energy Commission has granted project approval.

Any comments on this Final Decision/Determination shall be forwarded to:
**Eldon Heaston, Executive Director**
**Mojave Desert Air Quality Management District**
**14306 Park Avenue**
**Victorville, CA 92392-2310**
**Attention: Samuel J. Oktay, PE**

## T. Agency Contacts for Solar One SEGS Air Quality

**EPA Region 9, Permit issuance and oversight, Enforcement:**

**Gerardo Rios, Chief Permits Office**
**United States EPA, Region IX**
**75 Hawthorne Street**
**San Francisco, CA 94105**

**California Air Resources Board, Regulatory oversight:**

**Mike Tollstrup, Chief**
**Project Assessment Branch**
**Stationary Sources Division**

**California Air Resources Board**
**PO Box 2815**
**Sacramento, CA 95812**

**California Energy Commission**

**Christopher Meyer, Project Manager**
**California Energy Commission**
**1516 Ninth Street, MS-15**
**Sacramento, CA 95814**
**Docket Number: 07-AFC-05**

**Mojave Desert Air Quality Management District, Permit issuance, enforcement:**

**Eldon Heaston, Executive Director**
**Mojave Desert Air Quality Management District**
**14306 Park Avenue**
**Victorville, CA 92392**
**Attention: Samuel J. Oktay, PE**

## U. Conclusion

The MDAQMD has reviewed the proposed project's impact, and determined that the post project facility will comply with all applicable State, Federal, and MDAQMD Rules and Regulations.

**The MDAQMD recommends approval of this project.**

**SES Solar One 06-03-09** Diesel Emergency Genset

| Emissions | | PTE Hrs/Year | BHP | PTE Hrs/Day | Max Daily PTE (pounds) | | | | Max Annual (pounds) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *App No.* | *Equipment* | | | | **NOx** | **SOX** | **CO** | **PM** | **NOx** | **SOX** | **CO** | **PM** |
| 00010423 | Cummins | *50* | *399* | *1* | 2.6 | 0.0 | 2.3 | 0.1 | 132.0 | 0.2 | 114.4 | 6.6 |
| | | | | Total | 2.6 | 0.0 | 2.3 | 0.1 | 132.0 | 0.2 | 114.4 | 6.6 |
| | | | | | | | **TONS/YEAR** | | 0.1 | 0.0 | 0.1 | 0.0 |

Cummins
Model QSL9-G3

| Pollutant | *Value (g/bhp-hr) |
|---|---|
| **NOX+HC:** | 3.0 |
| ***SOX:** | 0.005 |
| **CO:** | 2.60 |
| **PM:** | 0.15 |

*Estimated SOX emission factor calculated from estimated max fuel consumption rate, calculated below.
19.2 gal/hr X 7.08 lbs/gal X 453.515 g/lb X 0.0015/100 (sulfur) X 1/399bhp X 64.06 gSO2/32.06gS = 0.005

SOX Calculation:

| Value | Units | |
|---|---|---|
| 19.2 | gal/hr | |
| 7.08 | lbs/gal | (density of diesel fuel) |
| 453.515 | g/lb | |
| 0.000015 | sulfur fraction | |
| 0.0025063 | 1/bhp | |
| 1.9981285 | gSO2/S | |
| 0.005 | g SO2/Bhp-hr | |

SES Solar One ICE 06-02-09

Power Generation

# Exhaust Emission Data Sheet
# 250DQDAA
## 60 Hz Diesel Generator Set
## EPA Emission: Tier 3

**Engine Information:**

| | | | |
|---|---|---|---|
| Model: | Cummins Inc. QSL9-G3 NR3 | Bore: | 4.49 in. (114 mm) |
| Type: | 4 Cycle, In-line, 6 Cylinder Diesel | Stroke: | 5.69 in. (145 mm) |
| Aspiration: | Turbocharged and CAC | Displacement: | 543 cu.in. (8.9 liters) |
| Compression Ratio: | 16.8:1 | | |
| Emission Control Device: | Turbocharged and CAC | | |

| | 1/4 | 1/2 | 3/4 | Full | Full |
|---|---|---|---|---|---|
| PERFORMANCE DATA | Standby | Standby | Standby | Standby | Prime |
| BHP @ 1800 RPM (60 Hz) | 93 | 187 | 280 | 373 | 337 |
| Fuel Consumption (gal/Hr) | 5.9 | 11.5 | 15.9 | 19.2 | 17.9 |
| Exhaust Gas Flow (CFM) | 873 | 1537 | 1883 | 2085 | 2001 |
| Exhaust Gas Temperature (°F) | 618 | 774 | 941 | 1061 | 1013 |
| | | | | | |
| EXHAUST EMISSION DATA | | | | | |
| | | | | | |
| HC (Total Unburned Hydrocarbons) | 0.34 | 0.28 | 0.08 | 0.05 | 0.05 |
| NOx (Oxides of Nitrogen as NO2) | 2.74 | 1.73 | 2.70 | 3.55 | 3.17 |
| CO (carbon Monoxide) | 1.76 | 4.29 | 0.79 | 0.22 | 0.26 |
| PM (Particular Matter) | 0.32 | 0.15 | 0.04 | 0.03 | 0.02 |
| SO2 (Sulfur Dioxide) | 0.18 | 0.16 | 0.14 | 0.13 | 0.13 |
| Smoke (Bosch) | 2.33 | 1.78 | 1.08 | 1.00 | 1.05 |

All values are Grams per HP-Hour

**TEST CONDITIONS**

Data was recorded during steady-state rated engine speed (± 25 RPM) with full load (±2%). Pressures, temperatures, and emission rates were stabilized.

| | |
|---|---|
| Fuel Specification: | 46.5 Cetane Number, 0.035 Wt.% Sulfur; Reference ISO8178-5, 40 CFR86.1313-98 Type 2-D and ASTM D975 No. 2-D. |
| Fuel Temperature: | 99 ± 9 °F (at fuel pump inlet) |
| Intake Air Temperature: | 77 ± 9 °F |
| Barometric Pressure: | 29.6 ± 1 in. Hg |
| Humidity: | NOx measurement corrected to 75 grains H2O/lb dry air |
| Reference Standard: | ISO 8178 |

The NOx, HC, CO and PM emission data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.

Power Generation

# EPA Tier 3 Exhaust Emission Compliance Statement

## 250DQDAA

### 60 Hz Diesel Generator Set

**Compliance Information:**
The engine used in this generator set complies with U.S. EPA and California emission regulations under the provisions of 40 CFR 89, Nonroad (Mobile Off Highway) Tier 3 emissions limits when tested per ISO 8178 D2.

| | |
|---|---|
| Engine Manufacturer: | Cummins Inc. |
| EPA Certificate Number: | CEX-NRCI-08-38 |
| Effective Date: | 12/04/2007 |
| Date Issued: | 12/04/2007 |
| EPA Nonroad Diesel Engine Family: | 8CEXL0540AAB |
| CARB Executive Order: | U-R-002-0449 |

**Engine Information:**

| | | | |
|---|---|---|---|
| Model: | Cummins Inc. QSL9-G3 NR3 | Bore: | 4.49 in. (114 mm) |
| Engine Nameplate HP: | 399 | | |
| Type: | 4 Cycle, In-line, 6 Cylinder Diesel | Stroke: | 5.71 in. (145 mm) |
| Aspiration: | Turbocharged and CAC | Displacement: | 542 cu. in. ( 8.9 liters ) |
| Compression Ratio: | 16.8:1 | | |
| Emission Control Device: | Turbocharged and CAC | | |

**U.S. Environmental Protection Agency Nonroad Tier 3 Limits**

| COMPONENT | (All values are Grams per HP-Hour) |
|---|---|
| NOx + HC (Oxides of Nitrogen as NO2 + Total Unburned Hydrocarbons) | 3.0 |
| CO (Carbon Monoxide) | 2.6 |
| PM (Particulate Matter) | 0.15 |

Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

## EMISSIONS and HEALTH RISK ASSESSMENT WORKSHEET FOR GASOLINE DISPENSING

| | | | |
|---|---|---|---|
| Company Name | SES Solar One 03-19-09 | Company Number | 1836 |
| Facility Name | Near Hector Road & I-40 | Facility Number | 3100 |
| Permit Name | Newberry Springs, CA | Permit Number | TBD |

| Reporting Year [1] | Throughput [2] | | | Operating Schedule [3] | | Color Codes |
|---|---|---|---|---|---|---|
| ATC | Annual = | 50,000 | Gallons | Hours per Day | 24 | Mandatory |
| | Hourly = | 4,167 | Gallons | Days per Week | 7 | Optional |
| | Throughput is gallons of fuel dispensed | | | Weeks per Year | 52 | Results |

| Distance to Nearest Receptors [4] | Feet * | Meter | Adjustment Factor |
|---|---|---|---|
| Residual | 1000 | 305 | 1.00 |
| Offsite Work Place | 1000 | 305 | 0.15 |
| School | 1000 | 305 | 0.15 |
| Medical Facility | 1000 | 305 | 0.15 |
| Other Receptors | | | |
| | | 0 | |
| | | 0 | |
| | | 0 | |
| | | 0 | |

* If more than 3,300 ft (1,006 meters) enter 3,300 ft.

| Type of Vapor Controls [5] Enter Design Code (number) | 4 | |
|---|---|---|
| Design | Code | SCC [6] |
| Above Ground Tanks | | |
| On controls | 1 | 40600301 |
| Phase I Only | 2 | 40600306 |
| Phase I & II without Vent Values | 3 | 40600403 |
| Phase I & II with Vent Values | 4 | 40600403 |
| Under Ground Tanks | | |
| No Controls | 5 | 40600301 |
| Phase I Only | 6 | 40600306 |
| Phase I with Vent Values | 7 | 40600306 |
| Phase I & II without Vent Values | 8 | 40600403 |
| Phase I & II with Vent Values | 9 | 40600403 |

| Pollutants / Substance Name | CAS | Category | Emission Factor lbs/1,000 gal | Emission Rates | Type of Receptor | Distance meters | HRA [7] Cancer Risk per 1,000,000 | Isopleth [8] HRA=10 meters | Isopleth Factor |
|---|---|---|---|---|---|---|---|---|---|
| Criteria Pollutants | | | | lby | Maximum | 0 | 0.37 | I30 R< 20 | 200.00 |
| Total Organic Gases | 43101 | TOG | 1.52 | 0.038 | Residual | 305 | 0.04 | I30 R< 20 | 200.00 |
| Reactive Organic Gases | | ROG | 1.52 | 0.038 | Offsite Work Place | 305 | 0.01 | I30 R< 20 | 1329.39 |
| | | | | | School | 305 | 0.01 | I30 R< 20 | 1329.39 |
| Toxic Substances | | | | lbs/yr | Medical Facility | 305 | 0.01 | I30 R< 20 | 1329.39 |
| Benzene | 71432 | VOC | 0.0075 | 0.375 | | | | | |
| Ethylbenzene | 100414 | SVOC | 0.0067 | 0.336 | Other Receptors | | | | |
| Toluene | 108883 | VOC | 0.0336 | 1.680 | | 20 | 0.37 | I30 R< 20 | 200.00 |
| Xylene (Total) | 1210 | VOC | 0.0101 | 0.504 | | 20 | 0.37 | I30 R< 20 | 200.00 |
| | | | Total Toxics | 2.895 | | 20 | 0.37 | I30 R< 20 | 200.00 |
| | | | | | | 20 | 0.37 | I30 R< 20 | 200.00 |

Prepared By: Samuel Oktay Date: 6/2/2009

Reviewed By: Date:

FOOTNOTES

1. For an Authority to construct enter the letters "ATC".
2. Throughput is the gallons of gasoline dispensed in a year.
3. The default operating schedule is 8 hours per day, 5 days per week and 50 weeks per year.
4. Distance in feet from the center of the dispensing island or islands to the nearest offsite receptor if less than 3,300 feet (1,006 meters)
   a. Residual - property boundary
   b. Offsite workplace - building or outdoor work area
   c. School - outter property boundary
   d. Medical Facility - Building
5. BACT and T-BACT is defined as Phase I and II with pressure value on vent pipes (Vent Values). Vapor control code is either code 4 or 9.
6. The SIC for retail gasoline service (dispensing) station is 5541.
7. If Health Risk Assessment (HRA) is 10 or more additional review is required.
8. Radius (meters) of 10 in a million isopleth.
   a. I30 < 20 indicated the isopleth radius is less than 20 meters (66 feet).
   b. R EVIEW indication the isopleth radius is greater than 1,000 meters and additional review is required.