sierra research

Petition to Amend Air Quality Conditions of Certification for Ivanpah Solar Electric Generating System (07-AFC-5C)

prepared for:

Solar Partners I, LLC; Solar Partners II, LLC; Solar Partners VIII, LLC

submitted to:

California Energy Commission

March 2015

prepared by:

Sierra Research, Inc.
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Sacramento, California 95811
(916) 444-6666

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ACRONYMS AND ABBREVIATIONS

AFC	Application for Certification
ARB	Air Resources Board
BACT	Best Available Control Technology
CEC	California Energy Commission
COC	Condition of Certification
ISEGS	Ivanpah Solar Electric Generating System
LORS	Laws, Ordinances, Regulations, and Standards
MDAQMD	Mojave Desert Air Quality Management District
MMSCF	million standard cubic feet
MW	megawatt
PTA	Petition to Amend
U.S. EPA	United States Environmental Protection Agency

1. INTRODUCTION

1.1 Background

The California Energy Commission (CEC) issued a license for the Ivanpah Solar Electric Generating System (ISEGS) Project on September 22, 2010 (07-AFC-05C). The ISEGS Project consists of three individual units sharing common facilities: ISEGS Powerplant 1 is a nominal 120 MW plant located on approximately 914 acres; Powerplant 2 is a nominal 125 MW plant located on approximately 1,097 acres; and Powerplant 3 is a nominal 125 MW plant located on approximately 1,227 acres. ISEGS is located in San Bernardino County, California; the location of the Project is shown in Figure 1.

The CEC Compliance Project Manager (CPM) issued a letter authorizing the start of construction activities on October 8, 2010. Commercial operations at the plant began in December 2013.

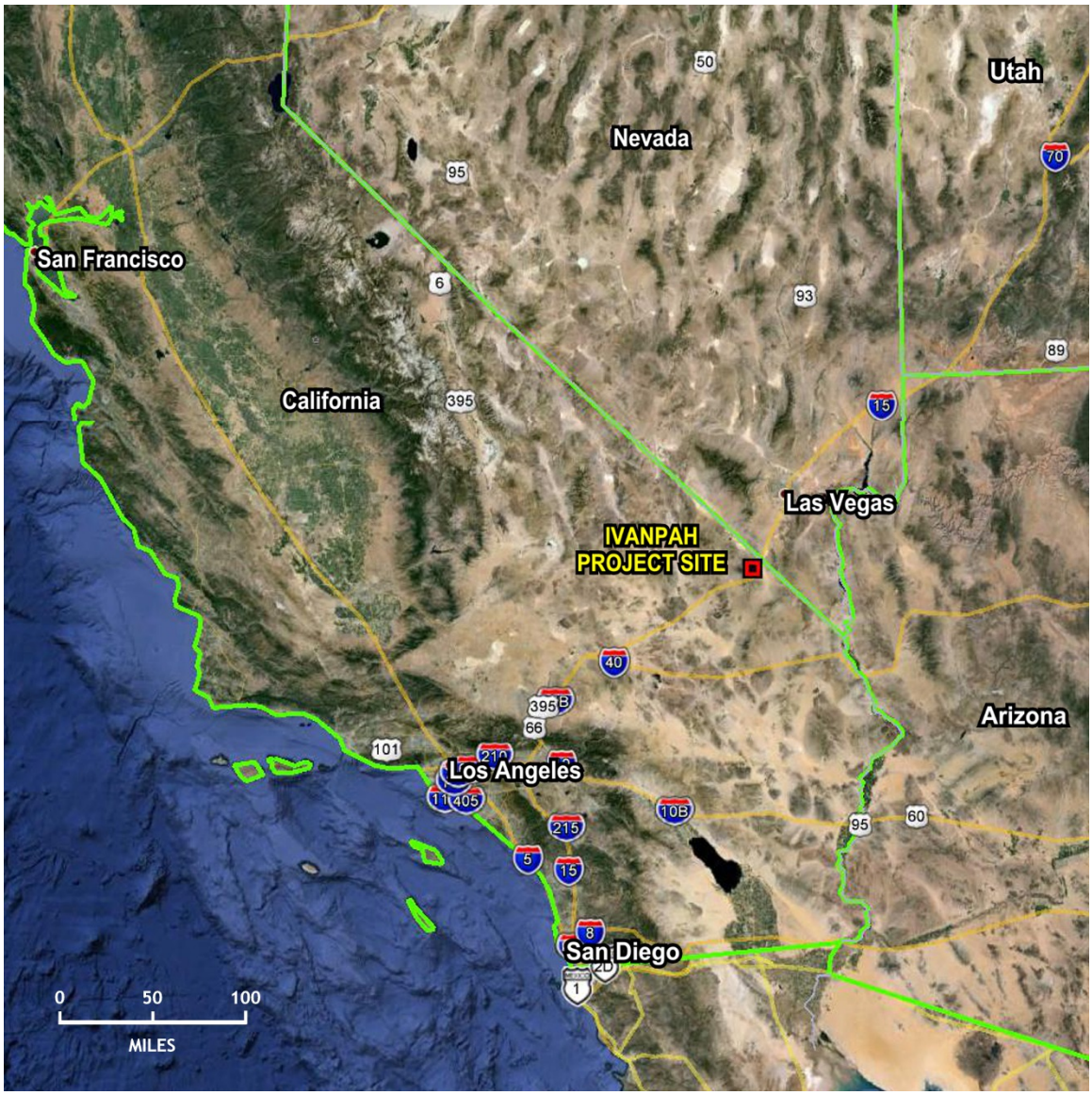
Pursuant to Section 1769 of the CEC Siting Regulations, each of Solar Partners I, LLC, Solar Partners II, LLC, and Solar Partners VIII, LLC (collectively, the Petitioner) petitions the California Energy Commission (CEC) for approval of amendments to equipment descriptions contained in the ISEGS license Conditions of Certification. The amendments revise the description of engines used for emergency generators and fire pumps to match the engines that were installed.

In addition, the Petitioner is proposing minor amendments to the Conditions of Certification to bring them into conformance with changes made by the District to the operating permits.

The emission units listed in the most recent CEC order approving changes to air quality conditions of certification (Order No. 12-0213-8, adopted February 13, 2013) include four emergency engines and four fire pump engines. These engines are not normally in operation; they are intended to operate during emergencies. However, they must be tested routinely in order to ensure that they can operate when needed in an emergency.

The information about these engines contained in the Applicant's previous submittals reflects the engine specifications contained in previous pre-construction permit applications submitted to the CEC and the Mojave Desert Air Quality Management District (MDAQMD). Now that the engines have been installed, additional information is available. The purpose of this application is to update the equipment descriptions contained in the Air Quality Conditions of Certification to reflect the as-installed engine information. No changes in substantive requirements are being requested.

Figure 1
Project Location



The updated engine information has been submitted to the MDAQMD and is reflected in an application for minor amendments also submitted to the District, which is provided as Appendix A.

1.2 Description of Proposed Amendments

The proposed amendments to the Conditions of Certification are presented in Section 3.2.2. They consist of minor changes to the descriptions of the engines powering the emergency generators and fire pumps to conform to the characteristics of the engines that have been installed, and minor changes to permit conditions consistent with changes requested of, or approved by, the District.

1.3 Necessity of Proposed Changes

Sections 1769 (a)(1)(B) and 1769 (a)(1)(C) of the CEC Siting Regulations require a discussion of the necessity for the proposed changes to the Conditions of Certification and a discussion of whether this modification is based on information that was known by the petitioner during the certification proceeding.

The emission units listed in the most recent CEC order approving changes to air quality conditions of certification (Order No. 12-0213-8, adopted February 13, 2013) include four emergency engines and four fire pump engines. These engines are not normally in operation; they are intended to operate during emergencies. However, they must be tested routinely in order to ensure that they can operate when needed in an emergency.

The information about these engines contained in the Applicant's previous submittals reflected the engine specifications contained in previous pre-construction permit applications submitted to the CEC and the Mojave Desert Air Quality Management District (MDAQMD). Now that the engines have been installed, additional information is available. The purpose of this application is to update the equipment descriptions contained in the Air Quality Conditions of Certification to reflect the as-installed engine information. Additionally, the District has made minor changes to permit conditions, consolidating redundant conditions, eliminating obsolete conditions, and making minor simplifications and corrections. Finally, Applicant is requesting that the District make additional minor clarifying/correcting changes, and is requesting that the CEC approve these same changes.

The need for these changes was not known to Petitioner during the CEC licensing process for the ISEGS Project.

1.4 Summary of Environmental Impacts

Section 1769 (a)(1)(E) of the CEC Siting Regulations requires that an analysis be conducted to address impacts that the proposed revisions may have on the environment and proposed measures to mitigate significant adverse impacts. Section 1769 (a)(1)(F) requires a discussion of the impacts of proposed revisions on the facility's ability to comply with applicable laws, ordinances, regulations, and standards (LORS).

The proposed changes referenced in this petition will not result in any additional potential significant impacts beyond those already identified in the original Final Decision. Section 3 discusses the potential impacts of the proposed changes on the environment, as well as the consistency of the proposed revisions with LORS.

1.5 Consistency of Amendment with License

Section 1769 (a)(1)(D) of the CEC Siting Regulations requires a discussion of the consistency of each proposed project revision with the assumptions, rationale, findings, or other basis of the Final Decision and whether the revision is based on new information that changes or undermines the bases of the final decision. Also required is an explanation of why the changes should be permitted.

Consistent with the CEC Siting Regulations Section 1769(a)(1)(A), this document includes a description of the requested project modifications, as well as the necessity for the changes. As set forth in the following sections, the proposed revisions do not undermine the assumptions, rationale, findings, or other basis of the Final Decision for the Project.

###

2. DESCRIPTION OF PROJECT CHANGES

2.1 Proposed Changes

The ISEGS comprises three solar concentrating thermal power plants, based on distributed power tower and heliostat mirror technology, in which heliostat (mirror) fields focus solar energy on power tower receivers near the center of each heliostat array. ISEGS Powerplant 1 is a nominal 120 MW plant located on approximately 914 acres; Powerplant 2 is a nominal 125 MW plant located on approximately 1,097 acres; and Powerplant 3 is a nominal 125 MW plant located on approximately 1,227 acres. Each site has a single receiver and heliostat array.

Each site is protected by an emergency generator and an emergency fire pump, each driven by a diesel emergency engine. Additionally, the common area is protected by an emergency generator and emergency fire pump.

The exact size, make, and model of these engines were not known during the permitting process. Final engines were selected during the final phases of design and construction. In order to accommodate this, the permits authorized substitution of equivalent engines for those that were evaluated.

The proposed changes in the Conditions of Certification will match the descriptions in the permits to the engines actually installed. The engines installed are equivalent to those described in previous submittals. They are of similar size, and all have the same EPA Tier certification (and thus the same maximum emission rates), as the engines reflected in the Commission's decision.

Table 1 compares the equipment ratings of the installed equipment with equipment ratings in the Conditions of Certification.

Table 1 **Comparison of Installed Equipment with Specifications in Conditions of Certification**		
Engine	As Installed	Conditions of Certification
Ivanpah 1 Emergency	2,206 HP	2,250 HP
Ivanpah 2 Emergency	2,206 HP	2,250 HP
Ivanpah 3 Emergency	2,206 HP	2,250 HP
Ivanpah 1 Fire Pump	316 HP	240 HP
Ivanpah 2 Fire Pump	316 HP	240 HP
Ivanpah 3 Fire Pump	316 HP	240 HP
Common Area Emergency	398 HP	333 HP
Common Area Fire Pump	157 HP	106.5 HP

###

3. ENVIRONMENTAL ANALYSIS OF THE PROJECT CHANGES

The proposed amendments to the ISEGS certification would be limited to changes to equipment descriptions contained in the COCs for air quality—there are no proposed changes to the project design. The discussion that follows is therefore restricted to the discipline of air quality. There would be no changes to the environmental baseline or to the environmental effects of the ISEGS as pertains to the other disciplines.

3.1 Subject Matter Unaffected by the Project Changes

The following disciplines will not be affected by the proposed changes in this amendment and are not addressed below: Worker Safety/Fire Protection, Hazardous Materials Management, Waste Management, Biological Resources, Soil and Water Resources, Cultural Resources, Geological and Paleontological Resources, Land Use, Traffic and Transportation, Socioeconomics, Noise and Vibration, and Visual Resources.

3.2 Air Quality

The majority of the environmental analysis is set forth in Appendix A, the "Application to the Mojave Desert Air Quality Management District for Amendment to the Air Quality Permit for Ivanpah Solar Energy Generating System."

The emission factors for each engine are the applicable federal standards for non-road engines (Tier 2 or Tier 3, depending on the size of the engine).

The applicable Tier standards for each engine are shown in Table 2. Also shown in Table 2 are the EPA-certified emission levels for the engine family for each engine.

Maximum proposed hourly emissions of criteria pollutants for each engine are compared with the hourly emissions reflected in the Commission decision in Table 3 below. Table 4 below compares the maximum proposed annual emissions of criteria pollutants for each engine with the annual emissions reflected in the Commission decision.

Table 2. Engine emission factors

EPA Family Number	Facility	Unit	Tier	EPA Standards, g/bhp-hr			EPA Certified emissions, g/bhp-hr				CARB Certified Emissions, g/bhp-hr			
				NOx + VOC	CO	PM	NOx + VOC	CO	PM	Citation	NOx + VOC	CO	PM	Citation
ACPXL58.6T2X	Ivanpah 1	Emergency Engine	2	4.8	2.6	0.15	4.2	0.7	0.10	EPA Large CI-2010	4.3	0.9	0.13	CARB EO U-R-001-0397
ACPXL58.6T2X	Ivanpah 2	Emergency Engine	2	4.8	2.6	0.15	4.2	0.7	0.10	EPA Large CI-2010	4.3	0.9	0.1	CARB EO U-R-001-0397
ACPXL58.6T2X	Ivanpah 3	Emergency Engine	2	4.8	2.6	0.15	4.2	0.7	0.10	EPA Large CI-2010	4.3	0.9	0.1	CARB EO U-R-001-0397
BCPXL08.8NZS	Common Area	Emergency Engine	3	3.0	2.6	0.15	2.2	0.7	0.13	EPA Large CI-2011				
AJDXL06.8101	Ivanpah 1	Fire Pump Engine	3	3.0	2.6	0.15	2.5	0.4	0.08	EPA Large CI-2010	2.5	0.4	0.08	CARB EO U-R-004-0387
BJDXL06.8131	Ivanpah 2	Fire Pump Engine	3	3.0	2.6	0.15	2.8	0.5	0.07	EPA Large CI-2011				
CJDXL13.5103	Ivanpah 3	Fire Pump Engine	3	3.0	2.6	0.15	2.5	0.4	0.07	EPA NRCI-cert-ghg-12b				
BJDXL06.8105	Common Area	Fire Pump Engine	4	3.0	3.7	0.22	2.5	1.1	0.19	EPA Large CI-2011	2.5	1.1	0.19	CARB EO U-R-004-429

Table 3 Maximum Hourly Emissions (lb/hr)							
Engine		NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$
Power Block Emergency[a]	NEW[b]	23.3	12.6	0.5	0.2	0.7	0.7
	OLD[c]	11.9	6.5	1.2	0.0	0.4	0.4
Power Block Fire Pump[a]	NEW[b]	2.1	1.8	0.2	0.0	0.1	0.1
	OLD[c]	1.6	1.4	0.2	0.0	0.1	0.1
Common Area Emergency[a]	NEW[b]	2.6	2.3	0.3	0.0	0.1	0.1
	OLD[c]	1.1	1.0	0.1	0.0	0.1	0.1
Common Area Fire Pump[a]	NEW[b]	1.0	1.3	0.1	0.0	0.1	0.1
	OLD[c]	0.7	0.6	0.1	0.0	0.0	0.0

a. Permit does not limit hours of emergency operation.
b. Assumes equipment operation for maintenance and testing is limited to 1-hour/day.
c. Equipment operation for maintenance and testing is limited to 30 minutes/day. "OLD" emissions from FDOC Rev E.

Table 4 Yearly PTE (tons/year)								
Engine		NOx	CO	VOC	SO_2	PM_{10}	$PM_{2.5}$	GHGs (CO_2e)
Power Block Emergency	NEW	0.58	0.32	0.01	0.01	0.02	0.02	59
	OLD	0.60	0.32	0.01	0.01	0.02	0.02	59
Power Block Fire Pump	NEW	0.05	0.05	0.01	0.00	0.00	0.00	7
	OLD	0.04	0.03	0.00	0.00	0.00	0.00	7
Common Area Emergency	NEW	0.07	0.06	0.01	0.00	0.00	0.00	8
	OLD	0.06	0.05	0.01	0.00	0.00	0.00	8
Common Area Fire Pump	NEW	0.03	0.03	0.00	0.00	0.00	0.00	6
	OLD	0.02	0.02	0.00	0.00	0.00	0.00	6
Total, Engines	NEW	0.73	0.45	0.03	0.01	0.03	0.03	80
	OLD	0.72	0.42	0.02	0.01	0.02	0.02	80

a. Permit does not limit hours of emergency operation. Equipment operation for maintenance and testing is limited to 50 hours/year. "OLD" emissions from FDOC Rev E. "New" emissions request does not require additional hours for annual limit on equipment operation for maintenance and testing.

The following sections describe the proposed changes to the Conditions of Certification

3.2.1 Delete requirement that natural gas usage be measured in standard cubic feet (AQ-3)

Petitioner has installed meters that measure gas usage in pounds. Petitioner uses fuel gas specifications provided by the gas supplier to calculate and record the gas usage in standard cubic feet for comparison with the usage limit in AQ-12. This change will have no effect on emissions.

3.2.2 Revise source test methods for annual compliance test (AQ-5 and AQ-6)

Petitioner requests removal of the reference to U.S. Environmental Protection Agency (EPA) Method 20, Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions From Stationary Gas Turbines, because this method is not applicable to boilers. Method 7E is a procedure for measuring NOx in stationary source emissions using a continuous instrumental analyzer. Method 19 includes procedures for converting analyzer measurements to emission rates.

Petitioner requests that Method 5 be added as an alternative to Method 201A, and that Method 202 be added as a required test method. Method 5 is a generally accepted method for measuring non-condensable particulate matter, and was approved for this purpose by the District for the initial compliance test. Method 202 is a necessary supplement to the other methods in order to measure condensable particulate matter.

The District's Compliance Manual, incorporated by reference into Condition 5, already authorizes the use of alternative test methods in compliance demonstrations. However, to avoid confusion, the use of alternative test methods has been incorporated into the District's permit condition.

These changes to the test methodology will not affect emissions.

3.2.3 Delete AQ-11

Condition AQ-11, which requires compliance with the recordkeeping and reporting requirements of NSPS Db, is redundant to Condition AQ-7, which requires compliance with all applicable requirements of NSPS Db. Petitioner requests that AQ-11 be deleted.

3.2.4 Change ratings and descriptions of engines to match the engines that were installed.

As documented in the District application, information about the emergency engines and fire pump engines is now available that was not available at the time that permits were issued. Additionally, engine ratings and fuel consumption rates of the engines are somewhat different. As shown in Table 4, the changes in rating result in inconsequential changes to annual emissions.

3.2.5 Change daily limit on engine testing for fire pumps and emergency generator engines to one hour (AQ-16, AQ-24, AQ-39, AQ-45)

Petitioner proposes to increase the engine testing procedure from 30 minutes per test to one hour. As shown in Table 3, this will increase the maximum hourly emissions from each engine by a factor of 2 above current limits. However, as documented in the District application, the increased hourly emissions will continue to be in compliance with ambient air quality standards. There will be a small increase in facility impact when compared with the impacts modeled during initial licensing.[1] However, regional air quality has improved since then, and the background NO_2 concentrations are much lower. The result is that testing for one hour will not cause or contribute to an exceedance of ambient air quality standards.

The Commission Decision determined that the Project would not have significant impacts on Air Quality or Public Health. Pursuant to this proposed PTA, the changes in the Project equipment configuration are not expected to have a significant impact on Air Quality.

3.2.6 Environmental Baseline Information

The proposed changes will not affect environmental baseline information.

3.2.7 Conditions of Certification and Proposed Changes

Petitioner requests that the conditions of certification be modified as follows (proposed deletions are shown in ~~strikeout~~; additions are <u>underlined</u>). Unless otherwise noted, all text is from the Commission Decision dated September 2010:

DISTRICT CONDITIONS OF CERTIFICATION
CONDITIONS APPLICABLE TO IVANPAH 1, 2 & 3 (THREE 3) AUXILIARY BOILERS, MDAQMD APPLICATION NUMBERS/PERMIT NUMBERS; 00009311 (B010375) 00009314 (B010376) & 00009320 (B010377), each consisting of:[2]

…

AQ-3 This boiler shall use only natural gas as fuel and shall be equipped with a meter measuring fuel consumption~~ in standard cubic feet~~.

Verification: As part of the Annual Compliance Report (COMPLIANCE-7), the project owner shall include proofs that only pipeline quality, or Public Utility Commission regulated natural gas are used for the boilers.

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[1] As shown in Table 1 of the District application, the hourly NOx emissions requested in this petition are only 10% higher than the levels modeled in the original proceeding. This is because the modeling in the original proceeding was based on 30 minutes of operation of much larger emergency engines. The "old" emission in Tables 3 and 4 reflect 30 minutes of operation for the smaller engines that were ultimately installed. Please see the District application for more details.

[2] This paragraph was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

…

AQ-5[3] Not later than 180 days after initial startup, the owner/operator shall perform an initial compliance test on this boiler in accordance with the District Compliance Test Procedural Manual. This test shall demonstrate that this equipment does not exceed the following emission maximums:

Pollutant	ppmvd	Lb/MMBtu	Lb/hr	
*NOx	9.0	0.011	2.7	(per USEPA Methods 7E and 19 ~~and 20~~)
SO2	1.7	0.003	0.7	
*CO	25.0	0.018	4.6	(per USEPA Methods 10)
VOC	12.6	0.005	1.3	(per USEPA Methods 25A and 18)
PM10	n/a	0.007	1.7	(per USEPA Methods 5 or 201A, and 202)

*corrected to 3% oxygen, on a dry basis, averaged over one hour
Opacity shall be conducted per Method 9; Flue gas flow rate shall be quantified in dscf per USEPA Methods 1 through 5. As indicated in the District Compliance Manual, the District may approve alternatives, modifications and/or deviations to the methods specified in this condition.

Verification: The project owner shall notify the District and the CPM within fifteen (15) working days before the execution of the compliance test required in this condition. The test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

AQ-6[4] The owner/operator shall perform annual compliance tests in accordance with the District Compliance Test Procedural Manual. Prior to performing these annual tests, the boiler shall be tuned in accord with the manufacturer's specified tune-up procedure, by a qualified technician. Subsequent tests shall demonstrate that this equipment does not exceed the following emission maximums:

Pollutant	ppmvd	Lb/MMBtu	Lb/hr	
*NOx	9.0	0.011	2.7	(per USEPA Methods 7E and 19 ~~and 20~~)
SO2	1.7	0.003	0.7	
*CO	25.0	0.018	4.6	(per USEPA Methods 10)
VOC	12.6	0.005	1.3	(per USEPA Methods 25A and 18)
PM10	n/a	0.007	1.7	(per USEPA Methods 5 or 201A, and 202)

*corrected to 3% oxygen, on a dry basis, averaged over one hour Opacity shall be conducted per Method 9; Flue gas flow rate shall be quantified in dscf per USEPA Methods 1 through 5.

[3] This condition was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.
[4]This condition was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

Verification: The project owner shall notify the District and the CPM within fifteen (15) working days before the execution of the compliance test required in this condition. The test results shall be submitted to the District and to the CPM within 60 days of the date of the tests.

…

~~AQ-11 The owner/operator shall comply with all applicable recordkeeping and reporting requirements of NSPS Db.~~

~~Verification: During site inspection, the project owner shall make all records and reports available to the District, ARB, U.S. EPA or CEC staff.~~

…

CONDITIONS APPLICABLE TO IVANPAH I, II, AND III EMERGENCY FIRE PUMPS, MDAQMD APPLICATION NUMBERS/PERMIT NUMBERS; 00009312 (E010380), 00009315 (E010378), AND 00009319 (E010384), each consisting of[5]

E010380: Year of Manufacture ~~2010~~2011, Tier III, One ~~Clarke~~John Deere, Diesel fired internal combustion engine, Model No. ~~JU6H-UF62~~6068HFC48B, and Serial number ~~tbd~~PE6068L185615, After Cooled, Direct Injected, Turbo Charged, producing ~~240~~ 316 bhp with 6 cylinders at ~~2,600~~2,350 rpm (or equiv.) while consuming a maximum of ~~10~~ 12.2 gal/hr. This equipment powers a pump.

E010378: Year of Manufacture 2010, Tier III, One John Deere, Diesel fired internal combustion engine, Model No. 6068HFC48B, and Serial number PE6068L185615, After Cooled, Direct Injected, Turbo Charged, producing 316 bhp with 6 cylinders at 2,350 rpm (or equiv.) while consuming a maximum of 12.2 gal/hr. This equipment powers a pump.

E010384: Year of Manufacture 2012, Tier III, One John Deere, Diesel fired internal combustion engine, Model No. 6068HFC48B, and Serial number PE6068L185615, After Cooled, Direct Injected, Turbo Charged, producing 316 bhp with 6 cylinders at 2,350 rpm (or equiv.) while consuming a maximum of 12.2 gal/hr. This equipment powers a pump.

These conditions (AQ-13 through AQ-19) apply separately to all three emergency fire pump engines unless otherwise specified.[6]

…

[5] This paragraph was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.
[6] This paragraph was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

AQ-16 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 1.0~~0.5~~ hours per day for a total of 50 hours per year for testing and maintenance. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine when operated per and in accord with the National Fire Protection Association (NFPA) 25 – "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. [[District Rule 1302(C)(2)(a) and Rule 1304 (D)(1)(a)] and 17 CCR 93115.3(n)] [Hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements.]

Verification: During site inspection, the project owner shall make all records and reports available to the District, ARB, U.S. EPA or CEC staff.

…

Conditions Applicable to Ivanpah I, II, and III (THREE – 3) Emergency Generators, MDAQMD Application Numbers/Permit Numbers; 00009313 (E010381), 00009316 (E010379), and 00009317 (E010382), each consisting of:[7]

Equipment Description:

Year of Manufacture 2010, Tier II, One Caterpillar, Diesel fired internal combustion engine, Model No. 3512C, and Serial Nos. EBG00874, EBG00875, and EBG00864~~tbd~~, After Cooled, Direct Injected, Turbo Charged, producing ~~2,250~~2,206 bhp with 16 cylinders at 1,800 rpm while consuming a maximum of 105 gal/hr. This equipment powers a Generator.[8]

These conditions (AQ-20 through AQ-26) apply separately to all three emergency generator engines unless otherwise specified.

…

AQ-24 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 ~~0.5~~1.0 hours per day for a total of 50 hours per year for testing and maintenance. [NSR and 17 CCR 93115] [Hours allowed by 50.42(f) streamlined out.]

Verification: During site inspection, the project owner shall make all records and reports available to the District, ARB, U.S. EPA or CEC staff.

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[7] This paragraph was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

[8] This paragraph was amended to its current form by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

…

CONDITIONS APPLICABLE TO COMMON AREA EMERGENCY GENERATOR, MDAQMD APPLICATION NUMBERS/PERMIT NUMBERS: MD100000061 (E011546), consisting of: [9]

Year of manufacture ~~2010~~2011, Tier III, Located in the Common Logistics Area; One ~~TBD~~Caterpillar, Diesel fired internal combustion engine Model No. ~~TBD~~ C9 and Serial No. ~~TBD~~S9L03837, producing ~~333~~ 398 bhp with ~~TBD~~ 6 cylinders at ~~TBD~~ 1,800 rpm while consuming a maximum of ~~TBD~~ 19.4 gm/bhp-hr. [10]

…

AQ-39 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 ~~0.5~~1.0 hours per day for a total of 50 hours per year for testing and maintenance. [NSR and 17 CCR 93115] [Hours allowed by 50.42(f) streamlined out.] [11]

…

CONDITIONS APPLICABLE TO COMMON AREA EMERGENCY FIRE PUMP, MDAQMD APPLICATION NUMBERS/PERMIT NUMBERS: MD100000062 (E011547), consisting of: [12]

Year of manufacture ~~TBD~~2011, Tier III, Located in the Common Logistics Area; One ~~Clarke (or equiv.)~~John Deere, Diesel fired internal combustion engine Model No. ~~JU4H-UFAD4G (or equiv.)~~4045HFC28A,B,C,D and Serial No. ~~TBD~~PE4045L162845, Direct injected, producing ~~106.~~156.9 5 bhp with 4 cylinders at 1760 rpm while consuming a maximum of 8.9~~,5~~ gal/hr. [13]

…

AQ-45 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 ~~0.5~~1.0 hours per day for a total

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[9] This paragraph was added by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.
[10] This paragraph was added by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.
[11] This condition was added by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.
[12] This paragraph was added by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.
[13] This paragraph was added by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

of 50 hours per year for testing and maintenance. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine when operated per and in accord with the National Fire Protection Association (NFPA) 25 – "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. [[District Rule 1302(C)(2)(a) and Rule 1304 (D)(1)(a)] and 17 CCR 93115.3(n)] [Hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements.] [14]

3.2.8 LORS

The Commission Decision certifying the ISEGS concluded that the project is in compliance with all applicable LORS. The ISEGS project, as modified with the proposed changes in this PTA, will continue to comply with all applicable LORS.

3.3 Public Health

The majority of the environmental analysis is set forth in Appendix A, the "Application to the Mojave Desert Air Quality Management District for Amendment to the Air Quality Permit for Ivanpah Solar Energy Generating System."

The proposed changes that could possibly affect Public Health are:

- Changes to the size of diesel engines.
- Changing the maximum duration of an engine test from 30 minutes to one hour

Changing the size of the diesel engines will result in a small increase in annual emissions (because the combined horsepower of the engines is larger). Changing the maximum duration of an engine test has no effect on annual emissions, and therefore only affects acute impacts. However, as shown in Table 5, the engines do not contribute to acute non-cancer health impacts

As discussed below in Section 3.3.3, the District's health risk prioritization scores for the entire facility remains Low for all health impacts, meaning that the increased emissions still have a very small impact offsite.

The Commission Decision determined that the Project would not have significant impacts on Air Quality or Public Health. Because annual emissions from the installed power block engines are similar to emissions that were previously modeled, and because the previously modeled impacts were very low, the changes described in this PTA are not expected to have a significant impact on Public Health.

[14] This condition was added by the *Order Approving a Petition to Modify Air Quality Conditions of Certification*, February 13, 2013.

3.3.1 Environmental Baseline Information

The proposed changes will not affect environmental baseline information.

3.3.2 Conditions of Certification

The PTA would not result in any necessary changes or additions to the CEC Conditions of Certification for Public Health.

3.3.3 LORS

The Commission Decision certifying the ISEGS concluded that the project is in compliance with all applicable LORS. The ISEGS project, as modified with the changes proposed in this PTA, will continue to comply with all applicable LORS.

The emissions in Table 5 show the health risk prioritization scores for the entire facility. HAP emissions in Table 5 reflect the combined emissions from all of the boilers and the combined emissions from all of the engines. The risk prioritization score for the entire facility remains Low for all health impacts.

Table 5
Facility Total Prioritization Scores [a]

Pollutant	Emission Factor[b,c] (lb/MMCF Fuel)	Max Firing Rate (MMCF/hr)	Fuel Use (MMCF/yr)	Emissions lb/hr	Emissions lb/yr	Emissions Annual avg lb/hr	Cancer Unit Risk ($(\mu g/m^3)^{-1}$)	Cancer Priority Score[e]	Chronic REL ($\mu g/m^3$)	Chronic Non-Cancer Priority Score[f]	Acute REL ($\mu g/m^3$)	Acute Non-Cancer Priority Score[g]
BOILERS (FACILITY TOTAL, THREE PLANTS)												
Acetaldehyde	8.87E-03	0.7618[h]	1,575[i]	6.76E-03	1.40E+01	1.59E-03	2.70E-06	6.41E-05	1.40E+02	1.71E-06	4.70E+02	2.16E-05
Benzene	2.10E-03	0.7618	1,575	1.60E-03	3.31E+00	3.78E-04	2.90E-05	1.63E-04	6.00E+01	9.44E-07	1.30E+03	1.85E-06
Formaldehyde	6.96E-02	0.7618	1,575	5.30E-02	1.10E+02	1.25E-02	6.00E-06	1.12E-03	9.00E+00	2.09E-04	5.50E+01	1.45E-03
Hexane	1.80E+00	0.7618	1,575	1.37E+00	2.84E+03	3.24E-01			7.00E+03	6.935E-06		
Naphthalene	6.10E-04	0.7618	1,575	4.65E-04	9.61E-01	1.10E-04	3.40E-05	5.553E-05	9.00E+00	1.83E-06		
PAHs – Total	1.00E-04	0.7618	1,575	7.62E-05	1.58E-01	1.80E-05	1.10E-04	2.95E-05				
Toluene	3.40E-03	0.7618	1,575	2.59E-03	5.36E+00	6.11E-04					3.70E+04	1.05E-07
ENGINES (FACILITY TOTAL, THREE PLANTS PLUS COMMON AREA)												
	(g/BHP-hr)	BHP	BHP-hr/year									
Diesel Particulate	0.15[d]	7,964	398,200	2.63E+00	1.32E+02	1.50E-02	3.00E-04	6.72E-02	5	4.51E-04		
Diesel Particulate	0.22[l]	157	7,850	7.62E-02	3.81E+00	4.35E-04	3.00E-04	1.94E-03	5	1.30E-05		
TOTAL								**0.071**		**0.0007**		**0.0015**
Prioritization	**Values < 1 are LOW priority**							**LOW**		**LOW**		**LOW**

a. Prioritization prepared following *CAPCOA Facility Prioritization Guidelines*, July 1990. Values shown are facility totals for all three plants plus the common area.
b. California Air Toxics Emission Factor (CATEF) database median emission factor (Acetaldehyde, Benzaldehyde, Benzene, Formaldehyde)
c. AP-42 emission factor (Hexane, Napthalene, Toluene)
d. Tier 2 PM emission limits. Tier 3 PM emission limits were not adopted; Tier 3 engines must meet Tier 2 PM emission limits
e. Cancer priority score for each pollutant = [Annual emission rate (lb/yr)] x [Unit risk] x [Distance adjustment factor (0.001 for >2000 m to nearest receptor)] x 1700 [normalizing factor]
f. Chronic non-cancer priority score for each pollutant = [Annual average emission rate (lb/hr)] / [Chronic REL] x [Distance adjustment] x 150 [normalizing factor]
g. Acute non-cancer priority score for each pollutant = [Maximum hourly emission rate (lb/hr)] / [Chronic REL] x [Distance adjustment] x 1500 [normalizing factor]
h. Combined firing rate for all six boilers = 3 x (249 MMBtu/hr) plus 3 x (10 MMBtu/hr) = 777 MMBtu/hr. (777 MMBtu/hr)/(1020 Btu/SCF)= 0.7618 MMSCF/hr)
i. Combined annual fuel use for all six boilers = 3 x 525 MMSCF = 1,575 MMSCF
j. Combined engine horsepower (proposed) = (3 x 2206) + (3 x 316) + 157 + 398 = 8,121 BHP.
Combined engine horsepower (in conditions of certification) = (3 x 2250) + (3 x 240) + 106.5 + 333 = 7,909.5 BHP.
k. Combined annual engine usage for testing = 50 hours/engine x 8,121 BHP = 406,050 BHP-hr/yr
l. Tier 2 PM emission limit for engines 100 <= hp < 175. Tier 3 PM emission limits were not adopted; Tier 3 engines must meet Tier 2 PM emission limits. This limit applies only to the common area fire pump engine.

###

4. POTENTIAL EFFECTS ON THE PUBLIC AND PROPERTY OWNERS

This section addresses potential effects of the proposed ISEGS Project changes in this PTA on nearby property owners, the public, and parties in the application proceeding, pursuant to CEC Siting Regulations (Title 20, CCR, Section 1769 [a][1][I]).

The ISEGS Project, as modified, will not differ significantly in potential effects on adjacent land owners, compared with the project as previously approved. The ISEGS Project would therefore have no adverse effects on nearby property owners, the public, or other parties in the application proceeding.

###

5. LIST OF PROPERTY OWNERS

As required by the CEC Siting Regulations §1769(a)(1)(H), a list of property owners potentially affected by the proposed modification must be provided. The only property owner within 1,000 feet of the project boundary is the federal government. The land surrounding the project is managed by BLM.

###

Appendix A

Application to the Mojave Desert Air Quality Management District for Amendment to the Air Quality Permit for Ivanpah Solar Energy Generating System

February 23, 2015

sierra research

1801 J Street
Sacramento, CA 95811
Tel: (916) 444-6666
Fax: (916) 444-8373

Ann Arbor, MI
Tel: (734) 761-6666
Fax: (734) 761-6755

Mr. Sam Oktay
Mojave Desert Air Quality Management District
14306 Park Avenue
Victorville, CA 92392-2310

Dear Mr. Oktay:

On behalf of Solar Partners I, LLC, Solar Partners II, LLC, and Solar Partners VIII, LLC (collectively, the "Applicant"), Sierra Research is submitting this request to revise certain permit conditions for emission units at Ivanpah Solar Electric Generating System (ISEGS). This request includes the following:

- This letter, which provides background and justification for the requested changes; and

- Attachment 1, consisting of marked-up copies of the current permits, issued by the District on December 8, 2014.

Request 1: Change "Authority to Construct" to "Permit to Operate" (B010375)

The document title should be revised to reflect the fact that the permit to operate has been issued.

Request 2: Delete requirement that natural gas usage be measured in standard cubic feet (Condition 3 of B010375, B010376, and B010377)

Applicant has installed meters that measure gas usage in pounds. Applicant uses fuel gas specifications provided by the gas supplier to calculate and record the gas usage in standard cubic feet for comparison with the usage limit in Condition 10.

Request 3: Revise source test methods for annual compliance test (Condition 5 of B010375, B010376, and B010377)

Applicant requests removal of the reference to U.S. Environmental Protection Agency (EPA) Method 20, *Determination of Nitrogen Oxides, Sulfur Dioxide, and Diluent Emissions From Stationary Gas Turbines*, because this method is not applicable to boilers. Method 7E is a procedure for measuring NOx in stationary source emissions using a continuous instrumental analyzer. Method 19 includes procedures for converting analyzer measurements to emission rates.

Applicant requests that Method 5 be added as an alternative to Method 201A, and that Method 202 be added as a required test method. Method 5 is a generally accepted method for measuring non-condensable particulate matter, and was approved for this purpose by the District for the initial compliance test. Method 202 is a necessary supplement to the other methods in order to measure condensable particulate matter.

Request 4: Change VOC limit back to 12.6 ppmvd. (Condition 5 of B010375, B010376, and B010377)

The original VOC limit was 12.6 ppmvd. Because the precision of the test method does not support 3 significant figures, this was changed to 12 ppmvd. The District subsequently changed the precision of all limits to the nearest tenth of a ppm, converting 12 ppmvd to 12.0. We ask that the District restore the original limit of 12.6 ppmvd if the additional significant figure is required.

Request 5: Change reference from Condition 6 to Condition 5 (Condition 9 of B010375, B010376, and B010377)

The District consolidated redundant permit conditions and eliminated obsolete conditions, resulting in renumbering of Conditions. Condition 9 refers to the initial source test requirement, now deleted because it is obsolete. It also refers to Condition 6, which has been renumbered by the District to Condition 5.

Request 6: Change ratings and descriptions of engines to match the fire pump engines that were installed. (Description of E010378, E010380, E010384, E011547).

Previous emission calculations for the fire pumps were based upon the power ratings listed on the pump manufacturer's Emissions Data sheets (provided in Attachment 2). However, the "power rating" on these sheets refers to the rating of the *pump* driven by the engine. The power rating for the *engine* is the value referred to as "Certified Power" on the Emissions Data sheets, provided in units of kW. Power ratings in kW are converted to BHP using a factor of 1.341 BHP/kW. The correct engine ratings for the fire pump engines are as follows:

- Power Block fire pumps: 316 BHP (236 kW)
- Common Area fire pump: 157 BHP (117 kW)

Additionally, the number of cylinders and engine RPMs were entered incorrectly when the engine serial numbers were inserted into the permits. Fire pump fuel consumption rates have been adjusted to match the engine RPM settings. The correct values are shown in the attached markups.

Finally, the year of manufacture for each of the three engines has been corrected.

Request 7: Change ratings and description of the common area emergency engine to match the engine that was installed. (Description of E0111546).

The engine rating and fuel consumption were entered incorrectly when the engine serial numbers were inserted into the permits. The correct values are shown in the enclosed markups.

Request 8: Change daily limit on engine testing for fire pumps and emergency generator engines to one hour (Condition 4 of E010378, E010380, E010384, and E011547, and Condition 5 of E010379, E010381, E010382, and E011546)

During initial permitting, a daily limit of 30 minutes for engine testing was imposed on each emergency generator and fire pump engine. This limit was proposed because dispersion modeling indicated that NO_2 impacts from the engines[1] driving the large 2,500 kW emergency generators could, when combined with worst-case background NO_2 concentrations, exceed the state 1-hour average NO_2 standard. The testing limit was imposed on all engines, not just the emergency engines, for simplicity and consistency.

Since the startup of the facility, operators have found that complying with the 30 minute limit has made it difficult to test the readiness of the engines.

After the project was certified, the facility design was changed and the large emergency generators were downsized to 1,500 kW. The engines and emissions were decreased proportionately. NOx emissions from 60 minutes of operation of the smaller engines are only slightly higher than NOx emissions from 30 minutes of operation by the originally proposed larger engines.

Additionally, air quality in the region has continued to improve. The worst-case background 1-hour NO_2 concentration at Barstow (the monitor used to characterize background concentrations at Ivanpah) has declined from 190 $\mu g/m^3$ in 2004-2006 to 146 $\mu g/m^3$ in 2011-2013.

As a result of these two factors, it can now be shown that the large emergency engines (and, in fact, all of the engines) may be operated for 60 minutes in an hour for testing purposes without risk of exceeding the state 1-hour NO_2 standard.

Table 1 shows the basis for this conclusion. Column 2 shows the 1-hour emission rates upon which current permits were based, based on 30 minutes of testing. Column 3 shows the modeled impact determined during initial permitting. Column 4 shows the proposed hourly emission rates, based on 60 minutes of testing. Column 5 shows the NO_2 impact from the proposed emission rates, assuming that the impact is proportional to emissions. This is a conservative assumption, because the conversion of NO to NO_2 is limited by ozone concentrations. For this reason the actual increase in impact is less than proportional to the increase in emissions. Column 6 shows the highest single 1-hour background concentration in the most recent 3 calendar year period for which data are available. Column 7 shows the combined impact of all project sources other than the

[1] The compliance demonstration actually considered the combined impact of the simultaneous operation of all three auxiliary boilers plus an engine; however, the boilers' contribution to the maximum impact is less than 5% of the total.

engine.[2] Column 8 shows the combined impact, which is in every case lower than the state standard by at least 50 µg/m^3, shown in Column 9.

The annual limit of 50 hours per year, imposed to ensure compliance with the California Air Toxic Control Measure for diesel emergency engines, is unaffected by this request.

Table 1. Estimated NO_2 Impact from Engines (µg/m^3, 1-hour average)

1	2	3	4	5	6	7	8	9
Engine	Original NOx Emissions (lbs/hr)[a]	Original Modeled Impact µg/m^3	Revised NOx Emissions (lbs/hr)[b]	Scaled Impact from Engine µg/m^3[c]	Maximum Background µg/m^3[d]	Other Project Sources µg/m^3[e]	Combined Impact µg/m^3[f]	State Standard µg/m^3
Ivanpah 1 Emergency Engine	21.0	114[g]	23.3	126.7	146	8	281	339
Ivanpah 2 Emergency Engine	21.0	72[g]	23.3	80.0			234	
Ivanpah 3 Emergency Engine	21.0	117[g]	23.3	130.1			284	
Ivanpah 1 Fire Pump Engine	1.6	18.5[h]	2.1	24.2			178	
Ivanpah 2 Fire Pump Engine	1.6	16.5[h]	2.1	21.6			176	
Ivanpah 3 Fire Pump Engine	1.6	13.0[h]	2.1	17.0			171	
Common Area Emergency Engine	1.1	21.1[h]	2.6	50.5			204	
Common Area Fire Pump Engine	0.33	6.2[h]	1.0	19.5			174	

a. Emissions based on 30 minutes of testing in one clock hour.
b. Proposed emissions based on 60 minutes of testing in one clock hour.
c. Impact scaled from previous modeling proportionate to emission rate.

[2] For the purposes of this analysis, it was assumed that the combined contribution of all other project sources (auxiliary boilers and nighttime preservation boilers) was 8 µg/m^3, the highest value contributed by these sources to modeled maximum impacts.

d. Maximum 1-hour concentration measured at Barstow monitoring station, 2011-2013. Because regional air quality has improved, this value is lower than the 2004-2006 value of 190.1 used in the original air quality impact analysis.
e. Contribution from all other sources (auxiliary and nighttime preservation boilers) to maximum impact. This value was calculated by subtracting the modeled impact for Emergency Engine 3 alone from the combined impact of all project sources.
f. Combined impact is the sum of the maximum equipment impact and the worst case background concentration.
g. Modeling results in support of September 20, 2007 initial application for permit.
h. Modeling results in support of March 30, 2011 application to amend permit.

Because the background concentration has declined, and because the installed large emergency engines emit slightly more than half as much NO_2 emissions as was originally approved, Applicant requests that the daily restriction on hours of testing be increased to one hour for all engines.

Please contact me at (510) 684-3671 if you have any questions about these requests.

Sincerely,

Steve Hill

cc: Tim Sisk, NRG Energy

Attachment

ATTACHMENT 1
MARKED-UP PERMITS

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

~~**AUTHORITY TO CONSTRUCT**~~
PERMIT TO OPERATE B010375

If construction is not completed by the expiration date of this permit, it may be renewed for one additional year upon payment of applicable fees. Any additional extension will require the written approval of the Air Pollution Control Officer. This Authority to Construct may serve as a temporary Permit to Operate provided the APCO is given prior notice of intent to operate and the Permit to Operate is not specifically denied.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1769)

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3007)

Ivanpah 1
Near Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
BOILER, Year of Manufacture 2012, Serial Number 2011-07, consisting of: Rentech D-type water tube boiler, equipped with Todd-Coen Ultra Low-NOx Burners rated at a maximum heat input of 249 MMBTU/hr, and flue gas recirculation (FGR or EGR) fueled exclusively on utility grade natural gas. Equipment shall use 242,500 cu-ft/hr of fuel and provide 175,000 lb/hr of steam. Boiler is equipped with a stack that is 130 feet high and 60 inches in diameter.

EQUIPMENT

Capacity	Equipment Description
249	MILLION BTU/HR BOILER

CONDITIONS:

1. Operation of this equipment must be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. The owner/operator (o/o) shall operate this equipment in strict accord with the recommendations of the manufacturer or supplier and/or sound engineering principles and consistent with all information submitted with the application for this permit, which produce the minimum emission of air contaminants.

3. This boiler shall use only natural gas as fuel and shall be equipped with a meter measuring fuel consumption ~~in standard cubic~~

Fee Schedule: 2 (f) Rating: 249000000 Btu SIC: 4911 SCC: 10300601 Location/UTM(Km): 640E/3933N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**
Eldon Heaston
Air Pollution Control Officer

~~feet~~.

4. The o/o shall maintain a current, on-site (at a central location if necessary) log for this equipment for five (5) years, which shall be provided to District, state or federal personnel upon request. This log shall include calendar year fuel use for this equipment in standard cubic feet, or BTUs, and daily hours of operation.

5. The owner/operator shall perform annual compliance tests in accordance with the District Compliance Manual. Prior to performing these annual tests, the boiler shall be tuned in accord with the manufacturers specified tune-up procedure, by a qualified technician. Subsequent tests shall demonstrate that this equipment does not exceed the following emission maximums:

7E and

6

Pollutant	ppmv	Lb/MMBTU	Lb/hr
*NOx	9.0	0.011	2.7 (Per USEPA Methods ~~19 and 20~~)
SO2	1.7	0.003	0.7
*CO	25.0	0.018	4.5 (Per USEPA Method 10)
VOC	12.0	0.005	1.3 (Per USEPA Methods 25A and 18)
PM10	n/a	0.007	1.7 (Per USEPA Methods 201A)

*corrected to 3% oxygen, on a dry basis, averaged over one hour

5 or

, and 202

Flue gas flow rate shall be quantified in dscf per USEPA Methods 1 through 5

6. This boiler shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (NSPS Db) including but not limited to recordkeeping and reporting requirements.

7. Records of fuel supplier certifications of fuel sulfur content shall be maintained to demonstrate compliance with the sulfur dioxide and particulate matter emission limits; PUC regulated pipeline quality natural gas meets this requirement.

8. The o/o shall continuously monitor and record fuel flow rate and flue gas oxygen level.

annual

5

9. In lieu of installing CEMs to monitor NOx emissions, and pursuant to 40 CFR 60 Subpart Db, Section 60.49b(c), the owner/operator shall monitor boiler operating conditions and estimate NOx emission rates per a District approved emissions estimation plan. The plan shall be based on the ~~initial~~ source tests ~~as~~ required by condition ~~6, and annually pursuant to condition 6~~. The plan shall include test results, operating parameters, analysis, conclusions and proposed NOx estimating relationship consistent with established emission chemistry and operational effects. This initial plan shall be submitted to the District for approval within 360 days of the initial startup. Any proposed changes to a District-approved plan shall include subsequent test results, operating parameters, analysis, and any other pertinent information to support the proposed changes. The District must approve any emissions estimation plan or revision for estimated NOx emissions to be considered valid.

10. The combined fuel use from the auxiliary boilers and nighttime preservation boilers shall not exceed 525 MMSCF of natural gas in any calendar year; combined fuel use is the sum total of natural gas combusted from Boilers with MDAQMD permit numbers B010375 and B011544 (Ivanpah 1) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair, B010376 and B011572 (Ivanpah 2) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair, B010377 and B011573 (Ivanpah 3) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair. [Rule 204; CEC Condition Of Certification]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

B010376

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1770)

Solar Partners I, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3008)

Ivanpah 2
Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
BOILER, Year of Manufacture 2012, Serial Number 2011-08, consisting of: Rentech D-type water tube boiler, equipped with Todd-Coen Ultra Low-NOx Burners rated at a maximum heat input of 249 MMBTU/hr, and flue gas recirculation (FGR or EGR) fueled exclusively on utility grade natural gas. Equipment shall use 242,500 cu-ft/hr of fuel and provide 175,000 lb/hr of steam. Boiler is equipped with a stack that is 130 feet high and 60 inches in diameter.

EQUIPMENT

Capacity	Equipment Description
249	MILLION BTU/HR BOILER

CONDITIONS:

1. Operation of this equipment must be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. The owner/operator (o/o) shall operate this equipment in strict accord with the recommendations of the manufacturer or supplier and/or sound engineering principles and consistent with all information submitted with the application for this permit, which produce the minimum emission of air contaminants.

3. This boiler shall use only natural gas as fuel and shall be equipped with a meter measuring fuel consumption ~~in standard cubic~~

Fee Schedule: 2 (f) Rating: 249000000 Btu SIC: 4911 SCC: 10300601 Location/UTM(Km): 644E/3934N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners I, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

~~feet.~~

4. The o/o shall maintain a current, on-site (at a central location if necessary) log for this equipment for five (5) years, which shall be provided to District, state or federal personnel upon request. This log shall include calendar year fuel use for this equipment in standard cubic feet, or BTUs, and daily hours of operation.

5. The owner/operator shall perform annual compliance tests in accordance with the District Compliance 7E and Manual. Prior to performing these annual tests, the boiler shall be tuned in accord with the manufacturers specified tune-up procedure, by a qualified technician. Subsequent tests shall demonstrate that this equipment does not exceed the following emission maximums:

6

Pollutant	ppmv	Lb/MMBTU	Lb/hr
*NOx	9.0	0.011	2.7 (Per USEPA Methods 19 ~~and 20~~)
SO2	1.7	0.003	0.7
*CO	25.0	0.018	4.5 (Per USEPA Method 10)
VOC	12.0	0.005	1.3 (Per USEPA Methods 25A and 18)
PM10	n/a	0.007	1.7 (Per USEPA Methods 201A)

*corrected to 3% oxygen, on a dry basis, averaged over one hour 5 or

Flue gas flow rate shall be quantified in dscf per USEPA Methods 1 through 5 , and 202

6. This boiler shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (NSPS Db) including but not limited to recordkeeping and reporting requirements.

7. Records of fuel supplier certifications of fuel sulfur content shall be maintained to demonstrate compliance with the sulfur dioxide and particulate matter emission limits; PUC regulated pipeline quality natural gas meets this requirement.

8. The o/o shall continuously monitor and record fuel flow rate and flue gas oxygen level.

annual 5

9. In lieu of installing CEMs to monitor NOx emissions, and pursuant to 40 CFR 60 Subpart Db, Section 60.49b(c), the owner/operator shall monitor boiler operating conditions and estimate NOx emission rates per a District approved emissions estimation plan. The plan shall be based on the ~~initial~~ source tests ~~as~~ required by condition ~~6, and annually pursuant to condition 6~~. The plan shall include test results, operating parameters, analysis, conclusions and proposed NOx estimating relationship consistent with established emission chemistry and operational effects. This initial plan shall be submitted to the District for approval within 360 days of the initial startup. Any proposed changes to a District-approved plan shall include subsequent test results, operating parameters, analysis, and any other pertinent information to support the proposed changes. The District must approve any emissions estimation plan or revision for estimated NOx emissions to be considered valid.

10. The combined fuel use from the auxiliary boilers and nighttime preservation boilers shall not exceed 525 MMSCF of natural gas in any calendar year; combined fuel use is the sum total of natural gas combusted from Boilers with MDAQMD permit numbers B010375 and B011544 (Ivanpah 1) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair, B010376 and B011572 (Ivanpah 2) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair, B010377 and B011573 (Ivanpah 3) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair. [Rule 204; CEC Condition Of Certification]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

B010377

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1771)

Solar Partners VIII, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3009)

Ivanpah 3
Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
BOILER, Year of Manufacture 2012, Serial Number 2011-09, consisting of: Rentech D-type water tube boiler, equipped with Todd-Coen Ultra Low-NOx Burners rated at a maximum heat input of 249 MMBTU/hr, and flue gas recirculation (FGR or EGR) fueled exclusively on utility grade natural gas. Equipment shall use 242,500 cu-ft/hr of fuel and provide 175,000 lb/hr of steam. Boiler is equipped with a stack that is 130 feet high and 60 inches in diameter.

EQUIPMENT

Capacity	Equipment Description
249	MMBTU/HR BOILER

CONDITIONS:

1. Operation of this equipment must be conducted in compliance with all data and specifications submitted with the application under which this permit is issued unless otherwise noted below.

2. The owner/operator (o/o) shall operate this equipment in strict accord with the recommendations of the manufacturer or supplier and/or sound engineering principles and consistent with all information submitted with the application for this permit, which produce the minimum emission of air contaminants.

3. This boiler shall use only natural gas as fuel and shall be equipped with a meter measuring fuel consumption ~~in standard cubic~~

Fee Schedule: 2 (f) | Rating: 249000000 Btu | SIC: 4911 | SCC: 10300601 | Location/UTM(Km): 644E/3934N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners VIII, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: B010377 Issue Date: 12/01/2014

~~feet.~~

4. The o/o shall maintain a current, on-site (at a central location if necessary) log for this equipment for five (5) years, which shall be provided to District, state or federal personnel upon request. This log shall include calendar year fuel use for this equipment in standard cubic feet, or BTUs, and daily hours of operation.

5. The owner/operator shall perform annual compliance tests in accordance with the District Compliance 7E and Manual. Prior to performing these annual tests, the boiler shall be tuned in accord with the manufacturers specified tune-up procedure, by a qualified technician. Subsequent tests shall demonstrate that this equipment does not exceed the following emission maximums:

6

Pollutant	ppmv	Lb/MMBTU	Lb/hr
*NOx	9.0	0.011	2.7 (Per USEPA Methods ~~19 and 20~~)
SO2	1.7	0.003	0.7
*CO	25.0	0.018	4.5 (Per USEPA Method 10)
VOC	12.0	0.005	1.3 (Per USEPA Methods 25A and 18)
PM10	n/a	0.007	1.7 (Per USEPA Methods 201A)

*corrected to 3% oxygen, on a dry basis, averaged over one hour 5 or , and 202

Flue gas flow rate shall be quantified in dscf per USEPA Methods 1 through 5

6. This boiler shall be operated in compliance with all applicable requirements of 40 CFR 60 Subpart Db - Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units (NSPS Db) including but not limited to recordkeeping and reporting requirements.

7. Records of fuel supplier certifications of fuel sulfur content shall be maintained to demonstrate compliance with the sulfur dioxide and particulate matter emission limits; PUC regulated pipeline quality natural gas meets this requirement.

8. The o/o shall continuously monitor and record fuel flow rate and flue gas oxygen level.

annual 5

9. In lieu of installing CEMs to monitor NOx emissions, and pursuant to 40 CFR 60 Subpart Db, Section 60.49b(c), the owner/operator shall monitor boiler operating conditions and estimate NOx emission rates per a District approved emissions estimation plan. The plan shall be based on the ~~initial~~ source tests ~~as~~ required by condition ~~6, and annually pursuant to condition 6~~. The plan shall include test results, operating parameters, analysis, conclusions and proposed NOx estimating relationship consistent with established emission chemistry and operational effects.
This initial plan shall be submitted to the District for approval within 360 days of the initial startup. Any proposed changes to a District-approved plan shall include subsequent test results, operating parameters, analysis, and any other pertinent information to support the proposed changes. The District must approve any emissions estimation plan or revision for estimated NOx emissions to be considered valid.

10. The combined fuel use from the auxiliary boilers and nighttime preservation boilers shall not exceed 525 MMSCF of natural gas in any calendar year; combined fuel use is the sum total of natural gas combusted from Boilers with MDAQMD permit numbers B010375 and B011544 (Ivanpah 1) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair, B010376 and B011572 (Ivanpah 2) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair, B010377 and B011573 (Ivanpah 3) and shall not exceed a total of 525 mmscf in any calendar year in that boiler pair. [Rule 204; CEC Condition Of Certification]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E010378

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1769)

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3007)

Ivanpah 1
Near Ca/Nev border at Primm
Ivanpah, CA 92364

Description:

DIESEL IC ENGINE, FIRE PUMP consisting of: Year of Manufacture ~~2011~~ 2010, Tier III, EPA Engine Family AJDXL06.8101; CARB Executive Order: U-R-004-0387; EPA Certificate: JDX-NRCI-10-09; EPA Engine Complies with 40 CFR PART 60 SUBPART III

One John Deere, Diesel fired internal combustion engine Model No. 6068HFC48B and Serial No. PE6068L117510, After Cooled, Direct Injected, Electronic Control Module, Exhaust Gas Recirculation, High Pressure Fuel Injection (also EM), Turbo Charged, producing ~~240~~ 6 bhp with ~~4~~ 6 cylinders at ~~1760~~ 2350 rpm while consuming a maximum of ~~10~~ 12.2 gal/hr. This equipment powers a Clarke Pump Model No. 6AEF17 and Serial No. 9927021651-10-B2-10-A, rated at 2400 rpm 167 bhp.

EMISSIONS RATES 316

Emission Type	Est. Max Load	Unit
CO	0.4	gm/bhp-hr
NOx+NMHC	2.5	gm/bhp-hr
PM10	0.08	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205 and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20100102 | Location/UTM(Km): 640E/3933N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: E010378 Issue Date: 12/08/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

1.0

4. 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 ~~0.5 hrs~~ per day for a total of 50 hours per year for testing and maintenance. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. [District Rule 1302(C)(2)(a) and Rule 1304 (D)(1)(a)] and 17 CCR 93115.3(n); hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements.]

5. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

6. These engines may operate in response to fire suppression requirements and needs. [Rule 204]

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern. [Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E010379

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1769)

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3007)

Ivanpah 1
Near Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
DIESEL IC ENGINE, EMERGENCY GENERATOR consisting of: Year of Manufacture 2010, Tier II; EPA Family ACPXL58.6T2X; CARB Executive Order U-R-001-0397; EPA Engine Complies with 40 CFR PART 60 SUBPART IIII

One Caterpillar, Diesel fired internal combustion engine Model No. 3512C and Serial No. EBG00874, After Cooled, Direct Injected, Electronic Control Module, High Pressure Fuel Injection (also EM), Turbo Charged, producing 2206 bhp with 16 cylinders at 1800 rpm while consuming a maximum of 105 gal/hr. This equipment powers a Caterpillar Generator Model No. SR4B-GD and Serial No. G6J00518, rated at 1500Kw.

EMISSIONS RATES

Emission Type	Est. Max Load	Unit
CO	0.9	gm/bhp-hr
NOx+NMHC	4.3	gm/bhp-hr
PM10	0.1	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205, and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20100102 | Location/UTM(Km): 640E/3933N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: E010379 Issue Date: 12/08/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

4. 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. [17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

1.0

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 ~~0.5 hrs~~ per day for a total of 50 hours per year for testing and maintenance. [NSR and 17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

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. Monthly and 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) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM, the more stringent requirements shall govern. [Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E010380

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1770)

Solar Partners I, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3008)

Ivanpah 2
Ca/Nev border at Primm
Ivanpah, CA 92364

Description:

DIESEL IC ENGINE, FIRE PUMP consisting of: Year of Manufacture 2011, Tier III, EPA Engine Family BJDXL06.8131; CARB Executive Order: Not Applicable; EPA Certificate: JDX-NRCI-11-30; EPA Engine Complies with 40 CFR PART 60 SUBPART III

One John Deere, Diesel fired internal combustion engine Model No. 6068HFC48B and Serial No. PE6068L185615, After Cooled, Direct Injected, Electronic Control Module, Exhaust Gas Recirculation, High Pressure Fuel Injection (also EM), Turbo Charged, producing ~~240~~ 316 bhp with ~~4~~ 6 cylinders at ~~2400~~ 2350 rpm while consuming a maximum of ~~10~~ 12.2 gal/hr. This equipment powers a Clarke Pump Model No. 6AEF17 and Serial No. 9927021651-10-B2-10-A, rated at 2350 rpm 167 bhp.

EMISSIONS RATES

Emission Type	Est. Max Load	Unit
CO	0.5	gm/bhp-hr
NOx+NMHC	2.8	gm/bhp-hr
PM10	0.07	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205 and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20100102 | Location/UTM(Km): 644E/3934N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners I, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: E010380 Issue Date: 12/08/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

1.0

4. 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 ~~0.5 hrs~~ per day for a total of 50 hours per year for testing and maintenance. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. [District Rule 1302(C)(2)(a) and Rule 1304 (D)(1)(a)] and 17 CCR 93115.3(n); hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

5. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

6. These engines may operate in response to fire suppression requirements and needs. [Rule 204]

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern. [Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E010381

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1770)

Solar Partners I, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3008)

Ivanpah 2
Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
DIESEL IC ENGINE, EMERGENCY GENERATOR consisting of: Year of Manufacture 2010, Tier II; EPA Family ACPXL58.6T2X; CARB Executive Order U-R-001-0397; EPA Engine Complies with 40 CFR PART 60 SUBPART IIII

One Caterpillar, Diesel fired internal combustion engine Model No. 3512C and Serial No. EBG00875, After Cooled, Direct Injected, Electronic Control Module, High Pressure Fuel Injection (also EM), Turbo Charged, producing 2206 bhp with 16 cylinders at 1800 rpm while consuming a maximum of 105 gal/hr. This equipment powers a Caterpillar Generator Model No. SR4B-GD and Serial No. G6J00521, rated at 1500Kw.

EMISSIONS RATES

Emission Type	Est. Max Load	Unit
CO	0.9	gm/bhp-hr
NOx+NMHC	4.3	gm/bhp-hr
PM10	0.1	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205, and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20100102 | Location/UTM(Km): 644E/3934N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners I, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: E010381 Issue Date: 12/08/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

4. 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. [17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

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 ~~0.5~~ 1.0 hrs per day for a total of 50 hours per year for testing and maintenance. [NSR and 17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements.]

6. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern. [Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E010382

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1771)

Solar Partners VIII, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3009)

Ivanpah 3
Ca/Nev border at Primm
Ivanpah, CA 92364

Description:

2010

DIESEL IC ENGINE, EMERGENCY GENERATOR consisting of: Year of Manufacture ~~2011~~, Tier II; EPA Family ACPXL58.6T2X; CARB Executive Order U-R-001-0397; EPA Engine Complies with 40 CFR PART 60 SUBPART IIII

One Caterpillar, Diesel fired internal combustion engine Model No. 3512C and Serial No. EBG00864, After Cooled, Direct Injected, Electronic Control Module, High Pressure Fuel Injection (also EM), Turbo Charged, producing 2206 bhp with 16 cylinders at 1800 rpm while consuming a maximum of 105 gal/hr. This equipment powers a Caterpillar Generator Model No. SR4B-GD and Serial No. G6J00517, rated at 1500Kw.

EMISSIONS RATES

Emission Type	Est. Max Load	Unit
CO	0.7	gm/bhp-hr
NOx+NMHC	4.2	gm/bhp-hr
PM10	0.10	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205, and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20100102 | Location/UTM(Km): 644E/3934N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners VIII, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: E010382 Issue Date: 12/08/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

4. 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. [17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

1.0

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 ~~0.5 hrs~~ per day for a total of 50 hours per year for testing and maintenance. [NSR and 17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

6. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern. {Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E010384

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1771)

Solar Partners VIII, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3009)

Ivanpah 3
Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
DIESEL IC ENGINE, FIRE PUMP consisting of: Year of Manufacture 2012, Tier III, EPA Engine Family CJDXL13.5103; CARB Executive Order: Not Applicable; EPA Certificate: CJDXL13.5103-020; EPA Engine Complies with 40 CFR PART 60 SUBPART IIII

316 2350 12.2

One John Deere, Diesel fired internal combustion engine Model No. 6068HFC48 and Serial No. PE6068L228488, After Cooled, Direct Injected, Electronic Control Module, Exhaust Gas Recirculation, High Pressure Fuel Injection (also EM), Turbo Charged, producing 240 bhp with 4 cylinders at 1760 rpm while consuming a maximum of 10 gal/hr. This equipment powers a Clarke Pump Model No. 6AEF17 and Serial No. 9927021652-10-A, rated at 2350 rpm 158 bhp.

EMISSIONS RATES 6

Emission Type	Est. Max Load	Unit
CO	0.4	gm/bhp-hr
NOx+NMHC	2.5	gm/bhp-hr
PM10	0.07	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part

Fee Schedule: 7 (g) Rating: 1 device SIC: 4911 SCC: 20100102 Location/UTM(Km): 644E/3934N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners VIII, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**
Eldon Heaston
Air Pollution Control Officer

Permit: E010384 Issue Date: 12/08/2014

60 Subparts 60.4205 and 60.4211]

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

4. 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 ~~0.5 hrs~~ 1.0 per day for a total of 50 hours per year for testing and maintenance. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. [District Rule 1302(C)(2)(a) and Rule 1304 (D)(1)(a)] and 17 CCR 93115.3(n); hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

5. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

6. These engines may operate in response to fire suppression requirements and needs. [Rule 204]

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern. [Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E011546

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1769)

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3007)

Ivanpah 1
Near Ca/Nev border at Primm
Ivanpah, CA 92364

Description:

398

19.4

DIESEL IC ENGINE, EMERGENCY GENERATOR consisting of: Year of Manufacture 2011, Tier III, EPA Family BCPXL08.8NZS Located in the Common Logistics Area; EPA Engine Complies with 40 CFR PART 60 SUBPART IIII

One Caterpillar, Diesel fired internal combustion engine Model No. C9 and Serial No. S9L03837, After Cooled, Direct Injected, Turbo Charged, producing ~~297~~ bhp with 6 cylinders at 1800 rpm while consuming a maximum of ~~74~~ gal/hr. This equipment powers a Caterpillar Generator Model No. LCS and Serial No. G5A04954, rated at 250Kw.

EMISSIONS RATES

Emission Type	Est. Max Load	Unit
CO	0.7	gm/Kw-hr
NOx+NMHC	2.2	gm/Kw-hr
PM10	0.13	gm/Kw-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205, and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20200102 | Location/UTM(Km): 640E/3933N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**

Eldon Heaston
Air Pollution Control Officer

Permit: E011546 Issue Date: 12/11/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

4. 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. [17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

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 ~~0.5~~ 1.0 hrs per day for a total of 50 hours per year for testing and maintenance. [NSR and 17 CCR 93115; hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

6. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

7. If you are an owner or operator of a stationary CI internal combustion engine equipped with a diesel particulate filter to comply with the emission standards in 60.4204, the diesel particulate filter must be installed with a backpressure monitor that notifies the owner or operator when the high backpressure limit of the engine is approached. [60.4209]

8. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern.[Rule 204]

MOJAVE DESERT AIR QUALITY MANAGEMENT DISTRICT
14306 Park Avenue, Victorville, CA 92392-2310
760.245.1661 -- 800.635.4617 -- FAX 760.245.2022

PERMIT TO OPERATE

E011547

Operation under this permit must be conducted in compliance with all information included with the initial application, initial permit condition, and conditions contained herein. The equipment must be maintained and kept in good operating condition at all times. This Permit to Operate or copy must be posted on or within 8 meters of equipment. If a copy is posted, the original must be maintained on site, available for inspection at all times.

EXPIRES LAST DAY OF: OCTOBER 2015

OWNER OR OPERATOR (Co.#1769)

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

EQUIPMENT LOCATION (Fac.#3007)

Ivanpah 1
Near Ca/Nev border at Primm
Ivanpah, CA 92364

Description:
DIESEL IC ENGINE, FIRE PUMP consisting of: Year of Manufacture 2011, Tier III, EPA Engine Family BJDXL06.8105; CARB Executive Order: U-R-004-0429; EPA Certificate: JDX-NRCI-11-14; EPA Engine Complies with 40 CFR PART 60 SUBPART IIII

8.9

One John Deere, Diesel fired internal combustion engine Model No. 4045HFC28A,B,C,D and Serial No. PE4045L162845, Direct Injected, producing 156.9 bhp with 4 cylinders at 1760 rpm while consuming a maximum of ~~8.5~~ gal/hr. This equipment powers a Clarke Fire Pump Model No. 6AEF16G and Serial No. 9927021646-10-A, rated at 1760 rpm 76 bhp.

EMISSIONS RATES

Emission Type	Est. Max Load	Unit
CO	1.1	gm/bhp-hr
NOx+NMHC	2.5	gm/bhp-hr
PM10	0.19	gm/bhp-hr

CONDITIONS:

1. This engine, certified in accordance with 40 CFR Part 89, and after treatment control device (if any) shall be installed, operated and maintained according to the manufacturer's emission-related written instructions. Further, the owner/operator shall change only those emission-related settings that are permitted by the manufacturer. Unless otherwise noted, this equipment shall also be operated in accordance with all data and specifications submitted with the application for this permit. [40 CFR Part 60 Subparts 60.4205 and 60.4211]

Fee Schedule: 7 (g) | Rating: 1 device | SIC: 4911 | SCC: 20100102 | Location/UTM(Km): 640E/3933N

This permit does not authorize the emission of air contaminants in exces of those allowed by law, including Division 26 of the Health and Safty Code of the State of California and the Rules and Regulations of the District. This permit cannot be construed as permission to violate existing laws, ordinances, statutes or regulations of this or other governmental agencies. This permit must be renewed by the expiration date above. If billing for renewal fee required by Rule 301(c) is not received by expiration date above, please contact the District.

Solar Partners II, LLC
HCR1 Box 280
Nipton, CA 92364

By: **COPY**
Eldon Heaston
Air Pollution Control Officer

Permit: E011547 Issue Date: 12/11/2014

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. [17 CCR 93115; 60.4207(b)]

3. A non-resettable hour meter with a minimum display capability of 9,999 hours shall be installed and maintained on this unit to indicate elapsed engine operating time. [Title 17 CCR 93115.10(e)(1); 60.4209(a)]

1.0

4. 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 ~~0.5 hrs~~ per day for a total of 50 hours per year for testing and maintenance. The 50 hour limit can be exceeded when the emergency fire pump assembly is driven directly by a stationary diesel fueled CI engine operated per and in accord with the National Fire Protection Association (NFPA) 25 - "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems," 1998 edition. This requirement includes usage during emergencies. [District Rule 1302(C)(2)(a) and Rule 1304 (D)(1)(a)] and 17 CCR 93115.3(n); hours allowed by federal regulation 40 CFR 60.42(f) streamlined out as these permit requirements are more stringent than the federal regulatory requirements]

5. The owner/operator 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, etc.);
c. Monthly and calendar year operation in terms of fuel consumption (in gallons) and total hours [17 CCR 93115]; 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.) [17 CCR 93115]

6. These engines may operate in response to fire suppression requirements and needs. [Rule 204]

7. This unit is subject to the requirements of the Airborne Toxic Control Measure (ATCM) for StationaryCompression Ignition Engines (17 CCR 93115) and 40 CFR Part 60, Subpart IIII (NSPS). In the event of conflict between these conditions and the ATCM or NSPS, the more stringent requirements shall govern. [Rule 204]

ATTACHMENT 2
PUMP MANUFACTURER EMISSIONS DATA SHEETS

Rating Specific Emissions Data - John Deere Power Systems

JOHN DEERE

Nameplate Rating Information	
Clarke Model	JU4H-UFADP0
Power Rating (BHP / kW)	121 / 90
Certified Speed (RPM)	1760

Rating Data		
Rating	4045HFC28A	
Certified Power (kW)	117	
Rated Speed	1760	
Vehicle Model Number	Clarke Fire Pump	
Units	g/kW-hr	g/hp-hr
NOx	3.7	2.8
HC	0.1	0.1
NOx + HC	3.8	2.8
Pm	0.12	0.09
CO	1.3	1.0

Certificate Data	
Engine Model Year	2011
EPA Family Name	BJDXL06.8105
EPA JD Name	350HAC
EPA Certificate Number	JDX-NRCI-11-14
CARB Executive Order	U-R-004-0429
Parent of Family	4045HF285A
Units	g/kW-hr
NOx	3.3
HC	0.1
NOx + HC	3.4
Pm	0.25
CO	1.5

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

This information is property of Deere & Company. It is provided solely for the purpose of obtaining certification or permits of Deere powered equipment. Unauthorized distribution of this information is prohibited

Rating Specific Emissions Data - John Deere Power Systems

JOHN DEERE

Nameplate Rating Information	
Clarke Model	JU6H-UFADR0
Power Rating (BHP / kW)	240 / 179
Certified Speed (RPM)	2350, 2400

Rating Data		
Rating	6068HFC48B	
Certified Power (kW)	236	
Rated Speed	2400	
Vehicle Model Number	Clarke Fire Pump	
Units	g/kW-hr	g/hp-hr
NOx	3.4	2.6
HC	0.1	0.1
NOx + HC	3.5	2.6
Pm	0.11	0.08
CO	0.8	0.6

Certificate Data	
Engine Model Year	2011
EPA Family Name	BJDXL06.8131
EPA JD Name	350HAL
EPA Certificate Number	JDX-NRCI-11-30
CARB Executive Order	Not Applicable
Parent of Family	6068HFG85A
Units	g/kW-hr
NOx	3.7
HC	0.1
NOx + HC	3.8
Pm	0.10
CO	0.7

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardware, and we do not guarantee that every production engine will have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

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Rating Specific Emissions Data - John Deere Power Systems

JOHN DEERE

Nameplate Rating Information	
Clarke Model	JU6H-UFADR0
Power Rating (BHP / kW)	240 / 179
Certified Speed (RPM)	2350, 2400

Rating Data		
Rating	6068HFC48B	
Certified Power (kW)	236	
Rated Speed	2400	
Vehicle Model Number	Clarke Fire Pump	
Units	g/kW-hr	g/hp-hr
NOx	3.4	2.6
HC	0.1	0.1
NOx + HC	3.5	2.6
Pm	0.11	0.08
CO	0.8	0.6

Certificate Data	
Engine Model Year	2012
EPA Family Name	CJDXL13.5103
EPA JD Name	650HAA
EPA Certificate Number	CJDXL13.5103-020
CARB Executive Order	Not Applicable
Parent of Family	6135HF485A
Units	g/kW-hr
NOx	3.3
HC	0.1
NOx + HC	3.4
Pm	0.10
CO	0.6

* The emission data listed is measured from a laboratory test engine according to the test procedures of 40 CFR 89 or 40 CFR 1039, as applicable. The test engine is intended to represent nominal production hardw are, and w e do not guarantee that every production engine w ill have identical test results. The family parent data represents multiple ratings and this data may have been collected at a different engine speed and load. Emission results may vary due to engine manufacturing tolerances, engine operating conditions, fuels used, or other conditions beyond our control.

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