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Final
Determination of Compliance

(Final New Source Review Document)

Palmdale Hybrid Power Project
Palmdale, California

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List of Abbreviations

APCO	Air Pollution Control Officer
ATC	Authority To Construct
ATCM	Airborne Toxic Control Measure
AVAQMD	Antelope Valley Air Quality Management District
BACT	Best Available Control Technology
CARB	California Air Resources Board
CATEF	California Air Toxics Emission Factors
CEC	California Energy Commission
CEMS	Continuous Emissions Monitoring System
CERMS	Continuous Emission Rate Monitoring System
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CTG	Combustion Turbine Generator
dscf	Dry Standard Cubic Feet
ERC	Emission Reduction Credit
°F	Degrees Fahrenheit (Temperature)
FDOC	Final Determination of Compliance
HAP	Hazardous Air Pollutant
HARP	Hot Spots Analysis and Reporting Program
HDPP	High Desert Power Project
HHV	Higher Heating Value
hp	Horsepower
hr	Hour
HRA	Health Risk Assessment
HRSG	Heat Recovery Steam Generator
HTF	Heat Transfer Fluid
LAER	Lowest Achievable Emission Rate
lb	Pound
MACT	Maximum Achievable Control Technology
$\mu g/m^3$	Micrograms per cubic meter
MDAQMD	Mojave Desert Air Quality Management District
MMBtu	Millions of British Thermal Units
n/a	Not applicable
NAAQS	National Ambient Air Quality Standard
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NSPS	New Source Performance Standard
O_2	Molecular Oxygen
OEHHA	Office of Environmental Health Hazard Assessment
OLM	Ozone Limiting Method
o/o	Owner/Operator
PAH	Polycyclic Aromatic Hydrocarbons

PDOC	Preliminary Determination of Compliance
PHPP	Palmdale Hybrid Power Project
$PM_{2.5}$	Fine Particulate, Respirable Fraction ≤ 2.5 microns in diameter
PM_{10}	Fine Particulate, Respirable Fraction ≤ 10 microns in diameter
ppmvd	Parts per million by volume, dry
PSD	Prevention of Significant Deterioration
RSP	Rapid Start Process
SCAQMD	South Coast Air Quality Management District
SJVAPCD	San Joaquin Valley Unified Air Pollution Control District
SCLA	Southern California Logistics Airport
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_x	Oxides of Sulfur
STG	Steam Turbine Generator
TOG	Total Organic Gases
tpy	Tons per Year
USEPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

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1. Introduction

The Antelope Valley Air Quality Management District (AVAQMD) received an Application for New Source Review for the Palmdale Hybrid Power Project (PHPP) and received a Request for Agency Participation and Application for Certification for the Palmdale Hybrid Power Project (PHPP) on August 18, 2008.[1] The AVAQMD released its initial new source review document, or Preliminary Determination of Compliance (PDOC), for the proposed project on February 12, 2009. Substantive comments were received by the AVAQMD from the Applicant, USEPA and CEC resulting in the issuance of a revised PDOC on June 22, 2009. Comments concerning the revised PDOC were received from USEPA on July 27, 2009. These comments generally addressed the evaluation, proposed permit conditions, and compliance demonstration requirements. The AVAQMD has addressed these comments herein.

As required by AVAQMD Rule 1306(E)(3)(a), this FDOC finalizes the AVAQMD's review of the proposed project, evaluating worst-case or maximum air quality impacts, and establishing control technology requirements and related air quality permit conditions. This FDOC represents AVAQMD's final pre-construction compliance review of the proposed project, to determine whether construction and operation of the proposed project will comply with all applicable AVAQMD rules and regulations.

2. Project Location

The PHPP site is located at 950 E Ave M, Palmdale, California. The project site is located on an approximately 333-acre parcel west of the northwest corner of U.S. Air Force Plant 42, and east of the intersection of Sierra Highway and E Ave M, within the City of Palmdale. The project site has been designated non-attainment for the Federal 8-hour ozone ambient air quality standard (NAAQS) and non-attainment for the California ozone and PM_{10} standards (CAAQS). The area is attainment or unclassified for all other standards and averaging times. The project site is currently essentially undeveloped desert.

3. Description of Project

The City of Palmdale (City) proposes to construct, own, and operate the PHPP, which consists of a hybrid of natural gas-fired combined-cycle generating equipment integrated with solar thermal generating equipment to be developed on an approximately 333-acre site in the northern portions of the City. The combined-cycle equipment utilizes two natural gas-fired combustion turbine generators (CTG), two heat recovery steam generators (HRSG), and one steam turbine generator (STG). The solar thermal equipment utilizes arrays of parabolic collectors to heat a high-temperature working fluid that is used to boil water to generate steam. The combined-cycle equipment is integrated thermally with the solar equipment at the HRSG and both utilize the single STG that is part of the Project.

The Project will have a nominal electrical output of 570 MW and commercial operation is planned for early 2013. The solar thermal input will provide approximately 10 percent of the

[1] E. Heaston (AVAQMD) to J. Kessler (CEC), August 28, 2008.

peak power generated by the Project during the daily periods of highest energy demand. The Project will be fueled with natural gas delivered via a new natural gas pipeline. The Southern California Gas Company (SCG) will design and construct the approximately 8.7-mile pipeline in existing street rights-of-way (ROW) within the City of Palmdale.

The project will have twin General Electric 7FA combustion turbine generators (CTGs) with dry low NO_x combustors driving dedicated duct burner-equipped heat recovery steam generators (HRSGs). Each gas turbine will have a maximum heat input rating of 1,736.4 million Btu per hour (MMBtu/hr), and each duct burner will have a maximum heat input rating of 424.3 MMBtu/hr. The (two) CTGs and (two) HRSG duct burners will be exclusively fueled by pipeline-quality natural gas, without back-up liquid fuel firing capability. The CTG power blocks will each include a turbine air compressor section, gas combustion system combustors, power turbine, and a 60-hertz generator. Inlet air will be filtered and conditioned, with inlet cooling provided by an evaporative type cooling system. Ambient air will be filtered and compressed in a multiple-stage axial flow compressor. Compressed air and natural gas will be mixed and combusted in the turbine combustion chamber. Lean pre-mix low NO_x combustors will be used to minimize NO_x formation during combustion. Exhaust gas from the combustion chamber will then expand through a multi-stage power turbine which drives both the air compressor and the electric power generator. Heat from the exhaust gas will then be recovered in a HRSG.

Each HRSG is a horizontal, natural circulation type unit with three pressure levels of steam generation. A duct burner in each HRSG will provide supplementary firing during high ambient temperatures (limited to 2000 hours per year) to maintain constant steam production to the condensing STG. A selective catalytic reduction (SCR) system and high temperature oxidation catalyst will be located within each HRSG. Steam will be produced in each HRSG and flow to the STG. The STG will drive an electric generator to produce electricity. STG exhaust steam will be condensed in a surface condenser with water from a mechanical draft wet cooling tower.

PHPP will employ a “Rapid Start Process” (RSP) to shorten startup durations through the use of a modified steam drum complex. In support of this process, the project includes a limited use (500 hour per year) natural gas-fired auxiliary boiler equipped with low NO_x burners (9 ppmvd) with a maximum heat input rating of 110 MMBtu/hr. The auxiliary boiler will provide a sealing steam header to minimize HRSG and STG startup thermal limitations.

The hybrid nature of the project is based on 251 acres of parabolic sun-tracking mirrors focused on and heating a heat transfer fluid (HTF). The heated fluid circulates through a dedicated steam boiler that provides supplemental steam to each HRSG high pressure steam drum. The solar side will include a limited use (1000 hour per year) natural gas-fired HTF heater equipped with low NO_x burners (9 ppmvd) with a maximum heat input rating of 40 MMBtu/hr. The HTF heater will ensure the HTF circulation system remains above a minimum system temperature of approximately 54 degrees Fahrenheit (°F) during off-line periods.

Power plant cooling will be provided by a 10-cell, mechanical draft cooling tower. The cooling tower will employ drift eliminators to reduce emissions from the tower. The cooling tower will

have a recirculation rate of 130,000 gallons per minute of reclaimed water and is expected to have a maximum of 5000 ppm of total dissolved solids (TDS).

A small amount of emergency electrical power will be provided on site by a (2000 kW) 2683 horsepower (hp) diesel-fired internal combustion engine and shaft generator. Emergency fire suppression water pressure will be provided on site by a 182 hp (135 kW) diesel-fired internal combustion engine and shaft water pump.

Overall Project Emissions

PHPP will produce exhaust emissions during three basic performance modes: startup, operations mode, and shutdown. In addition to combustion related emissions, the project will have evaporative and entrained particulate emissions due to the operation of an evaporative cooling tower. There will also be fugitive emissions from the use of vehicles for maintenance in the solar field. PM_{10} emission estimates include filterable and condensable particulate (front and back half of the particulate sampling train). Turbine emissions estimates are based on manufacturer data and mass balance. The project is proposing the use of General Electric 7FA gas turbines - operational and transient emissions are based on General Electric data.[2] For natural gas-fired equipment, emissions calculations are based on the Higher Heating Value (HHV) of the natural gas fuel. A Process Flow Diagram is provided in the emissions Appendix.

Maximum Annual Emissions

Table 1 presents maximum annual facility operational emissions (Table 1A presents maximum annual facility hazardous air pollutant (HAP) emissions). Maximum annual emissions with transients are calculated by assuming fifty cold starts, 260 other (not cold) starts, 310 shutdowns and 4207 hours of operation at the 64° F at 100 percent load hourly rate, with 2000 hours of duct burner operation and maximum auxiliary equipment operation (50 hours for emergency engines). Maximum annual NO_x transient emissions are calculated by assuming 8760 hours of operation at the 64° F at 100 percent load hourly rate, with 2000 hours of duct burner operation and maximum auxiliary equipment operation. Maximum annual SO_x emissions are calculated by assuming 8760 hours at the maximum fuel use rate and maximum duct burner operation with a fuel sulfur content of 0.2 grains/100 dry standard cubic feet and complete conversion of fuel sulfur to exhaust SO_x. The maximum annual cooling tower PM_{10} emissions are calculated by assuming 8760 hours of operation and are included in the facility totals. Maximum total SO_x emissions are presented as 9 tpy, but an unknown fraction of these (fuel sulfur) emissions are accounted for in the PM_{10} emissions (as the PM_{10} estimate includes filterable and condensable particulate). For this project, $PM_{2.5}$ emissions are assumed to be equal to PM_{10} emissions, except for the fugitive $PM_{2.5}$ emissions from vehicles in the solar field, which were calculated using a $PM_{2.5}$ emissions factor.

[2] "Application for Certification Palmdale Hybrid Power Project," ENSR, July 2008

Table 1 – PHPP Maximum Annual Operational Emissions (All emissions presented in tons per year)	NO_x	CO	VOC	SO_x	PM_{10}	$PM_{2.5}$
Entire Facility (with transients)	90	255	38	5	88	81
Entire Facility (no transients)	115	80	40	9	128	125
PHPP Facility Maximum	**115**	**255**	**40**	**9**	**128**	**125**

Table 1A – PHPP Maximum Annual HAP Emissions (All emissions presented in pounds per year)	Total	Threshold
1,3-Butadiene	15	20,000
Acetaldehyde	1389	20,000
Acrolein	222	20,000
Benzene	417	20,000
Ethylbenzene	1111	20,000
Formaldehyde	2465	20,000
Naphthalene	45	20,000
PAH	0	20,000
Propylene Oxide	1007	20,000
Tolulene	4514	20,000
Xylene	2223	20,000
TOTAL HAPS	13,424	**50,000**
Ammonia	197,000	n/a
Note: Threshold equivalent to 10 tpy per HAP and 25 tpy combined		

Maximum Daily Emissions

Table 2 presents maximum daily facility emissions calculated under worst case conditions. Maximum daily NO_x, VOC and CO emissions are calculated by assuming one cold start, two other starts, three shutdowns and 18 hours of operation (with duct burners) at the 23 degree Fahrenheit hourly rate. Maximum daily SO_x and PM_{10} emissions are calculated by assuming 24 hours of operation at the maximum fuel use rate (with duct burners) with a fuel sulfur content of 0.2 grains/100 dscf and complete conversion of fuel sulfur to exhaust SO_x.

Table 2 – PHPP Maximum Daily Operational Emissions	NOx	CO	VOC	SO_x	$PM_{10/2.5}$
Pounds per day	1359	4853	577	64	931

Equivalent Hourly Emission Rates

Table 3 presents maximum hourly emission rates for each CTG (including HRSG) in operational mode. The cooling tower will emit a maximum of 1.63 pounds of PM_{10} per hour. Cooling tower emissions are not included in this table.

Table 3 – PHPP Operational Mode Hourly Emission Rates (per CTG)[1]

All values in pounds per hour

Mode	NO_x	CO	VOC	SO_x	PM_{10} /$PM_{2.5}$
23° F at 100% load	13.47	8.20	4.70	1.05	12.0
23° F at 100% load with duct burner, no solar	16.60	15.16	5.79	1.29	18.0
64° F at 100% load	12.77	7.78	4.45	0.99	12.0
64° F at 100% load with duct burner, max solar	13.67	12.48	4.77	1.06	18.0

1. Assumes that both turbines are operating.

5. Control Technology Evaluation

Best Available Control Technology (BACT) is required for all new permit units at any new facility that emits, or has the potential to emit, 25 tons per year or more of any non-attainment pollutant or its precursors (AVAQMD Rule 1303(A)(3)). The proposed project site is state non-attainment for ozone and PM_{10} and their precursors, and Federal non-attainment for ozone and its precursors. Based on the proposed project's maximum emissions as calculated in §4 above, each permit unit at the proposed project must be equipped with Lowest Achievable Emission Rate (LAER) for NO_x and VOC, and BACT for CO, PM_{10} and $PM_{2.5.}$ The project will trigger BACT for CO, PM_{10} and $PM_{2.5}$ through PSD review; the AVAQMD specifies CO, PM_{10} and $PM_{2.5}$ BACT here to show its findings in advance of the PSD issuance by EPA. The applicant has submitted a BACT analysis that evaluates the BACT and LAER for these pollutants, trace organics, and trace metals.[3]

Both proposed internal combustion engines will be limited to emergency use, except for up to 50 hours per year for testing and maintenance, and required to comply with current emergency internal combustion BACT, which is conformance to the applicable off-road engine standards by size and engine model year. The generator engine must comply with Tier 2 limits, and the fire suppression water pump Tier 3 limits. Both engines will comply with the stationary internal combustion engine air toxics control measure through use limits.

All concentration levels presented in the following BACT determinations are corrected to 15% oxygen, unless otherwise specified. See also the discussion of Applicable Requirements in Section 10 of this analysis document. The BACT emission rates must be at least as stringent as applicable federal regulations such as the National Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP). This has been found to be the case for PHPP.

[3] ibid

Ammonia is a by-product of the selective catalytic reduction process, as some ammonia does not react and remains in the exhaust stream. As ammonia is not a regulated criteria air pollutant, but is a hazardous and toxic compound, the AVAQMD will address ammonia emissions as an element of the toxics new source review analysis (§8).

NO_x LAER

NO_x is a precursor of ozone, PM_{10} and $PM_{2.5}$. NO_x will be formed by the oxidation of atmospheric nitrogen during combustion within the gas turbine generating systems.

A review of recent combined-cycle CTG NO_x LAER determinations demonstrates that 2.0 ppm is the most stringent NO_x limit to date, with varying averaging times. PHPP is requesting 2.0 ppmvd averaged over one hour.

A limit on the ammonia slip is an integral part of the NO_x limit, due to the dynamics of the reduction chemistry and physical limits to the extent of the effective reduction chemistry zone (limited by temperature and duration). Ammonia slip dynamics are further complicated by the use of a duct burner within the HRSG, an integral part of the PHPP. A review of those same recent combined-cycle CTG (with duct burners) NO_x LAER determinations demonstrates that a maximum of five ppmvd ammonia slip is an element of the most stringent NO_x limit to date. PHPP is requesting five ppmvd ammonia slip.

By definition operation at transient conditions will disrupt operation of the selective catalytic reduction system, through temperature and flow variation. Minimizing the duration of transient conditions will also minimize the disruption of the combustion air pollution control system. PHPP proposes to use "Rapid Start Process" to minimize startup durations.

In order to determine BACT during startup and shutdown conditions, a review was conducted of other combined-cycle, natural gas-fired turbine applications. The VV2 Project PSD application addressed BACT for startups and shutdowns, and concluded that the RSP technology represented BACT for GE "F-class" combustion turbines. A review of other similar permits' operating approaches, operating controls, work practices and equipment performance and design did not identify any superior emission rates. Although it is difficult to compare the emission rates expected to be achieved with the RSP approach due to the significant variability of the emission levels permitted for combined-cycle power plants startup and shutdowns during the last decade, the emission levels proposed for PHPP are significantly lower and durations are shorter than other projects reviewed. The PHPP levels are the same as the LAER determination for the VV2 Project.

There are no other technically feasible control techniques to further reduce NO_x emissions during startup and shutdown. Mass emission rate limits, in pounds per event, proposed during startup and shutdown, and the specification of GE's RSP technology, therefore, represent BACT for emissions of NO_x during the short-term startup and shutdown events. The following NO_x emission rate limits are found to be LAER for these periods:

Hot/warm Startup:	40 pounds/event per turbine
Cold Startup:	96 pounds/event per turbine

Shutdown: 57 pounds/event per turbine

A review of recent small scale limited use natural gas combustion boiler/heater LAER determinations demonstrates that 9 ppmvd at 3% oxygen is the most stringent NO_x limit to date. PHPP is requesting 9 ppmvd at 3% oxygen for the auxiliary boiler and HTF heater.

The AVAQMD therefore determines that a maximum NO_x concentration of 2.0 ppmvd averaged over one hour, with an ammonia slip of 5 ppmvd averaged over three hours, and using "rapid" start operational methods, is acceptable as NO_x LAER for the PHPP combined cycle gas turbine power trains, achieved with low-NO_x burners and selective catalytic reduction in the presence of ammonia. Different BACT/LAER emission rates are defined above which apply during startup and shutdown operating mode.

The AVAQMD also determines that a maximum NO_x concentration of 9 ppmvd at 3% oxygen is acceptable as NO_x LAER for the PHPP limited use auxiliary boiler and HTF heater, achieved with low-NO_x burners. Since transient periods (startup and shutdown) for these units are expected to be brief and no emissions control technology is proposed, no different BACT emissions limits are specified for transient operations of this equipment.

CO BACT

Carbon monoxide is formed as a result of incomplete combustion of fuel within the gas turbine generating systems.

A review of recent combined-cycle CTG CO BACT determinations demonstrates that 2.0 ppm is the most stringent CO limit for similar facilities, with varying averaging times (3.0 ppm when duct burner operation is accounted for). PHPP is requesting 2.0 ppmvd averaged over one hour, 3.0 ppmvd averaged over one hour when the duct burner is in operation.

By definition operation at transient conditions will disrupt operation of the catalytic oxidation system, through temperature and flow variation. Minimizing the duration of transient conditions will also minimize the disruption of the combustion air pollution control system. PHPP proposes to use a "Rapid Start Process" to minimize startup durations. Similar to the NO_x BACT discussion, a review of other similar projects did not identify emission limits or durations more stringent than those proposed by the Applicant. Since there are no other technically feasible control techniques to further reduce emissions of CO during startup and shutdown periods, the mass emission rate limits, in pounds per event, proposed to limit CO emissions during startup and shutdown, therefore, represent BACT for this Project. The following CO emission rate limits during these periods are found to be BACT:

Hot/warm Startup:	329 pounds/event per turbine
Cold Startup:	410 pounds/event per turbine
Shutdown:	337 pounds/event per turbine

A review of recent small scale limited use natural gas combustion boiler/heater BACT determinations demonstrates that 50 ppmvd at 3% oxygen is the most stringent CO limit to date. PHPP is requesting 50 ppmvd at 3% oxygen for the auxiliary boiler and HTF heater.

The AVAQMD therefore determines that a maximum CO concentration of 2.0 ppmvd (without duct burning) and 3.0 ppmvd (with duct burning) averaged over one hour, and using "rapid" start operation methods, is acceptable as CO BACT for the PHPP combined cycle gas turbine power trains, achieved with an oxidation catalyst. Different BACT emission rates are defined above which apply during startup and shutdown operating mode.

The AVAQMD also determines that a maximum CO concentration of 50 ppmvd at 3% oxygen is acceptable as CO BACT for the PHPP limited use auxiliary boiler and HTF heater, achieved with low-NO_x burners. Similar to NO_x emissions, no separate CO BACT limit is defined for this equipment during transient periods.

PM_{10} and $PM_{2.5}$ BACT

Particulate will be emitted by the gas-fired systems due to fuel sulfur, inert trace contaminants, mercaptans in the fuel, dust drawn in from the ambient air and particulate of carbon, metals worn from the equipment while in operation, and hydrocarbons resulting from incomplete combustion. Particulate will also be emitted by the cooling towers through evaporation and particulate mist entrainment. Fugitive dust may also be caused by vehicle use in the solar field.

Natural-Gas Fired Equipment

There have not been any add-on particulate control systems developed for gas turbines from the promulgation of the first New Source Performance Standard for Stationary Turbines (40 CFR 60 Subpart GG, commencing with §60.330) in 1979 to the present. The cost of installing such a device has been and continues to be prohibitive and performance standards for particulate control of stationary gas turbines have not been proposed or promulgated by USEPA. Inlet filters are used to protect the gas turbine, which also have the effect of reducing particulate loading into the combustion process.

The most stringent particulate control method for gas-fired equipment is the use of low ash fuels such as natural gas. Combustion control and the use of low or zero ash fuel (such as natural gas) is the predominant control method listed for turbines, boilers, and heaters with PM limits. CARB guidance suggests a requirement to burn natural gas with a fuel sulfur content not greater than 1 grain/100 dscf is PM_{10} BACT. PHPP proposes the sole use of natural gas with a sulfur content not greater than 0.2 grains/100 dscf on an annual average basis as fuel.

The AVAQMD therefore determines that the sole use of natural gas fuel with a fuel sulfur content not greater than 0.2 grain per 100 scf on an annual average basis is acceptable as PM_{10} and $PM_{2.5}$ BACT for the PHPP combined cycle gas turbine power trains, auxiliary boiler and HTF heater.

Cooling Towers

The only particulate control method for evaporative cooling towers is the use of drift eliminators. PHPP proposes drift eliminators limiting drift to 0.0005 percent.

The AVAQMD therefore determines that drift eliminators limiting drift to 0.0005 percent are acceptable as PM_{10} and $PM_{2.5}$ BACT for the PHPP cooling towers.

VOC and Trace Organic LAER

VOC is a precursor for ozone and PM_{10} and $PM_{2.5}$. VOCs and trace organics are emitted from natural gas-fired turbines as a result of incomplete combustion of fuel and trace organics contained in pipeline-quality natural gas.

The most stringent VOC control level for gas turbines has been achieved by those which employ catalytic oxidation for CO control. An oxidation catalyst designed to control CO would provide a side benefit of controlling VOC emissions. The MDAQMD has determined that a maximum VOC concentration of 1 ppmvd averaged over one hour was VOC LAER for the High Desert Power Project (achieved through the use of an oxidation catalyst optimized for VOC control). PHPP proposes a VOC emission limit of 1.4 ppmvd without duct firing, 2.0 ppmvd with duct firing, achieved through the use of an oxidation catalyst. A slightly higher level than previous combined cycle gas turbine projects is proposed for PHPP due to changes in the configuration to accommodate the design changes associated with the "rapid start process" and its associated air pollutant reductions, for which there is no operational experience.

By definition operation at transient conditions will disrupt operation of the catalytic oxidation system, through temperature and flow variation. Minimizing the duration of transient conditions will also minimize the disruption of the combustion air pollution control system. PHPP proposes to use a "Rapid Start Process" to minimize startup durations. VOC emissions during startup and shutdown are controlled to a lesser extent than during normal operation because the oxidation catalyst is below its normal operating temperature range. Similar to the emissions of other pollutants, the GE RSP technology may be capable of reducing total startup VOC emissions on the order of 50 percent. There are no other technically feasible control techniques to further reduce emissions of VOC during startup and shutdown. The mass emission rate limits, in pounds per event, proposed to limit VOC emissions during startup and shutdown therefore represent LAER as follows:

Hot/warm Startup:	28 pounds/event per turbine
Cold Startup:	31 pounds/event per turbine
Shutdown:	29 pounds/event per turbine

A review of recent small scale limited use natural gas combustion boiler/heater BACT/LAER determinations demonstrates that combustion controls (in accordance with NO_x controls) are the most stringent VOC control requirement. PHPP is requesting natural gas as sole fuel and good combustion practices (not to exceed 0.005 lb/MMBtu VOC) for the auxiliary boiler and HTF heater.

The AVAQMD therefore determines that a maximum VOC concentration of 1.4 ppmvd averaged over one hour without duct burners, 2.0 ppmvd averaged over one hour with duct burners, and using "rapid" start operation methods, is acceptable as VOC and trace organic LAER for the PHPP combined cycle gas turbine power trains, achieved with an oxidation

catalyst. Different LAER emission rates are defined above which apply during startup and shutdown operating mode.

The AVAQMD also determines that a maximum VOC emission rate of 0.005 lb/MMBtu is acceptable as VOC LAER for the PHPP limited use auxiliary boiler and HTF heater, achieved with good combustion practices. Similar to NO_x and CO emissions, no separate VOC BACT limit is defined for this equipment during transient periods.

6. PSD Class I Area Protection

PHPP evaluated the NO_2, PM_{10}, and $PM_{2.5}$ increment consumption, visibility reduction potential, nitrogen deposition, and plume blight of project emissions on two (2) Prevention of Significant Deterioration (PSD) Class I areas within 100 kilometers of the proposed facility site. The USEPA has authority over the PSD permitting of this facility, and will have the ultimate responsibility to review and approve these analyses in order to issue the PSD permit. However, in its review of the PHPP permit application, AVAQMD reviewed the increment consumption, acid deposition, and visibility analysis methods and findings. AVAQMD found the methods to be acceptable and agrees with the findings. The following review findings are presented for informational purposes only.

Findings

PHPP NO_2 and PM_{10} concentrations at each of the two Class I areas are well below the USEPA Significant Impact Level and Class I increments. Although increments have not yet been defined for $PM_{2.5}$, maximum $PM_{2.5}$ concentrations were found to be less than two percent of the PSD Class I area PM_{10} increments. PHPP maximum 24-hour increase in the particle scattering coefficient at each area is less than the significant change level. Maximum PHPP deposition rates at each area are below the Federal Land Manager threshold. PHPP plume perceptibility and contrast were both well below the screening criteria at the applicable area.

Inputs and Methods

Visibility impacts were evaluated at the Cucamonga Wilderness Area and the San Gabriel Wilderness Area. CALMET meteorological data for 2002 through 2004 were used for the analysis. Worst-case one hour emissions were used for the analysis. NO_2, PM_{10}, and $PM_{2.5}$ increment, visibility and deposition impacts were evaluated using the USEPA CALPUFF model. Plume blight was evaluated using VISCREEN.

7. Air Quality Impact Analysis

PHPP performed the ambient air quality standard impact analyses for CO, PM_{10}, $PM_{2.5}$, SO_2 and NO_2 emissions. The AVAQMD approves of the analysis methods used in these impact analyses and the findings of these impact analyses.

Findings

The impact analysis calculated a maximum incremental increase for each pollutant for each applicable averaging period, as shown in Table 4 below. When added to the maximum recent background concentration, the PHPP did not exceed the most stringent (or lowest) standard for

any pollutant except PM_{10}, which is already in excess of the State standard without the project. The PHPP was estimated to consume a maximum annual NO_2 increment of 0.002 $\mu g/m^3$ in a PSD Class I area, which is less than the NO_2 increment threshold of 2.5 $\mu g/m^3$. The PHPP was estimated to consume a maximum annual NO_2 increment of 0.98 $\mu g/m^3$ in a PSD Class II area, which is less than the overall NO_2 increment threshold of 25 $\mu g/m^3$ and the 1.0 $\mu g/m^3$ Class II significant impact level.

Table 4 – PHPP Worst Case Ambient Air Quality Impacts

Pollutant	Project Impact[1]	Background	Total Impact[2]	Federal Standard	State Standard
	All values in $\mu g/m^3$				
CO (1 hour)	367.0	3680	4047.0	40,000	23,000
CO (8 hour)	20.4	1840	1860.4	10,000	10,000
PM_{10} (24 hour)	18.5	86	104.5	150	50
PM_{10} (annual)	1.8	25	26.8	n/a[3]	20
$PM_{2.5}$ (24 hour)	11.6[4]	17	28.6	35	n/a
$PM_{2.5}$ (annual)	1.3	8.9	10.2	15	12
SO_2 (1 hour)	1.7	34.1	35.8	n/a	665
SO_2 (3 hour)	1.3	23.6	24.9	1300	n/a
SO_2 (24 hour)	0.9	15.7	16.6	365	105
SO_2 (annual)	0.2	5.2	5.4	80	n/a
NO_2 (1 hour)	291.1	139.2[5]	291.1[5]	n/a	339
NO_2 (1 hour)	106.9[6]	139.2[5]	175.3[5], [6]	188[6]	n/a
NO_2 (annual)	6.6	28.2	34.8	100	57

1. Highest value from Table 5.2-48R, submitted to the CEC on May 1, 2009, except for 1-hour NO_2 NAAQS analysis (see note 6).
2. Modeled concentration plus ambient background, except for 1-hour NO_2 NAAQS analysis (see note 6).
3. The annual PM_{10} NAAQS of 50 $\mu g/m^3$ was revoked by EPA on September 21st, 2006. Federal Register Vol. 71 Number 200 10/17/2006.
4. $PM_{2.5}$ Project maximum emissions assumed equal to PM_{10} emissions for natural gas and diesel fired equipment, except for vehicle emissions in the solar field.
5. Modeled NO_2 concentrations as determined with the OLM. NO_2 background shown is the maximum during the 3-years, actual concentration based on an hourly matched background value per OLM analysis.
6. The new 1-hour NO_2 NAAQS of 100 ppb (188.1 $\mu g/m^3$) became effective April 12, 2010 (Federal Register on February 9, 2010). Applicant provided an analysis of the PHPP impacts with respect to this new standard on March 29, 2010. Project impact represents the 3-year average of the 98th percentile of the maximum impacts with background, based on the OLM analysis in AERMOD.

Inputs and Methods

Worst case emissions were used as inputs, meaning 100 percent full load in most cases, except for half load in the case of the three hour SO_2 standard and the 24 hour PM_{10} standard. Modeling of pollutants for annual averages was conducted using the 64 degree Fahrenheit emissions rate (the annual average condition). A three-year (2002 through 2004) sequential hourly

meteorological data set from the AVAQMD Sierra Avenue station was used, supplemented with cloud cover and cloud ceiling height data from the National Weather Service station at Fox Field in Lancaster. Mixing heights were determined from Desert Rock, Nevada data. For determining NO_2 impacts using a NO_x background, the hourly Ozone Limiting Method (OLM) for conversion of NO_x to NO_2 was used.

An analysis was performed by the Applicant to determine compliance with the new 1-hour NO_2 NAAQS (effective on April 12, 2010)[4]. For PHPP, the highest 3-year average of the 98th percentile of the daily maximum impacts was found to be 93.2 ppb (175.3 $\mu g/m^3$) against the new 1-hour NO_2 NAAQS of 100 ppb (188.1 $\mu g/m^3$). The contribution of PHPP sources was 56.8 ppb (106.9 $\mu g/m^3$) out of the total. Thus, compliance with the new standard is demonstrated.

The AERMOD dispersion model (version 04300) was used to estimate ambient concentrations resulting from PHPP emissions. The dispersion modeling was performed according to requirements stated in the USEPA Guideline on Air Quality Models.

8. Health Risk Assessment and Toxics New Source Review

PHPP performed a Health Risk Assessment (HRA) for carcinogenic, non-carcinogenic chronic, and non-carcinogenic acute toxic air contaminants. The AVAQMD approves of the HRA methods and findings.

Findings

The HRA calculated a peak 70-year cancer risk of 0.36 per million. The calculated peak 70-year residential cancer risk is less than 1.0 per million (for all receptors). The maximum non-cancer chronic and acute hazard indices are both less than the significance level of 1.0 (0.0008 and 0.028, respectively). As these risks make the project a "low priority" project, and as the project emits less than 10 tons per year of every single HAP and 25 tons per year of any combination of HAPs, no further toxics new source review is required for this project (Rule 1320(E)(2)(b)). Please refer to Table 1A above for a summary of project HAP emissions.

Inputs and Methods

PHPP will emit toxic air contaminants as products of natural gas combustion, diesel fuel combustion, equipment wear, ammonia slip from the SCR systems, and cooling tower emissions. Combustion emissions were estimated using emission factors from OEHHA and USEPA, and a speciation profile for polycyclic aromatic hydrocarbons (PAH) was derived from the California Air Toxics Emission Factors (CATEF) database. Ammonia slip was assumed to be 5 ppm in the stack exhaust. Cooling tower emissions were estimated using USEPA emission factors for evaporative emissions, engineering calculation for drift droplets, and water quality data from the Victor Valley Water Reclamation Authority.

The ISCST3 dispersion model (as incorporated into HARP) was used to estimate ambient concentrations of toxic air pollutants. The Hot Spots and Reporting Program (HARP, Version

[4] Email from S. Head (AECOM) to C. Anderson (AVAQMD), March 29 2010.

1.4, 2008) risk assessment model was used to estimate health risks due to exposure to emissions. The AERMET/AERMOD meteorological dataset was used for the risk analysis.

9. Offset Requirements

AVAQMD Regulation XIII – *New Source Review* requires offsets for non-attainment pollutants and their precursors emitted by large, new sources. PHPP has prepared and submitted a proposed offset package for the proposed project as required by Rule 1302(C)(3)(b). PHPP is proposed for a location that has been designated non-attainment by USEPA for ozone (and its precursors) and designated non-attainment by CARB for PM_{10} (and its precursors). AVAQMD Rule 1303(B)(1) specifies offset threshold amounts for the State non-attainment pollutant PM_{10}. AVAQMD Rule 1303(B)(1) also specifies offset threshold amounts for precursors of non-attainment pollutants: NO_x (precursor of ozone and PM_{10}), SO_x (precursor of PM_{10}), and VOC (precursor of ozone and PM_{10}). A new facility which emits or has the potential to emit more than these offset thresholds must obtain offsets equal to the facility's entire potential to emit. As Table 5 shows, maximum PHPP annual emissions exceed the offset thresholds for three of the four non-attainment pollutants and/or precursors. The table uses PHPP maximum or worst-case annual emissions. The table also includes all applicable emissions, including the emissions increases from proposed new permit units (turbines, duct burners, SCR, boiler, heater, engines and cooling equipment), cargo carriers (none are proposed), fugitive emissions (from vehicle use in the solar field), and non-permitted equipment (none are proposed). For this analysis the AVAQMD assumes SO_2 is equivalent to SO_x. Note that some fraction of sulfur compounds are included in both the SO_x and the PM_{10} totals, as the PM_{10} total includes front and back half particulate. Since $PM_{2.5}$ is an attainment pollutant for both the State and Federal standards, $PM_{2.5}$ offsets are not required for PHPP.

Table 5 - Comparison of PHPP Emissions with Offset Thresholds
All emissions in tons per year

	NO_x	**VOC**	**SO_x**	**PM_{10}**
Maximum Annual Potential to Emit	115	40	9	128
Offset Threshold	25	25	25	15

Required Offsets

AVAQMD Rule 1305 increases the amount of offsets required based on the location of the facility obtaining the offsets (on a pollutant category specific basis). As PHPP is located in two overlapping non-attainment areas, a Federal ozone non-attainment area and a State PM_{10} non-attainment area, the largest applicable offset ratio applies. Table 6 calculates the offsets required for PHPP.

Table 6 – Emission Offsets Required for PHPP All emissions in tons per year			
	NO_x	**VOC**	**PM_{10}**
PHPP Emissions	115	40	128
Offset Ratio	1.3	1.3	1.0
Required Offsets	**150**	**52**	**128**

Identified Potential Emission Reduction Credits

To offset the PHPP NO_x and VOC emissions, the Project Applicant initially proposed to obtain offsets from the SCAQMD Priority Reserve. Subsequent court actions, however, have rendered Priority Reserve offsets currently unavailable. As an alternative offset strategy, the Applicant has identified NO_x and VOC ERCs within the San Joaquin Valley Air Pollution Control District (SJVAPCD), and has executed a Confidential Term Sheet for Proposed Contingent Forward Purchase and Sale of San Joaquin Emission Reduction Credits with a seller of such ERCs in quantities sufficient to meet the needs of PHPP. In addition, the Applicant also continues to investigate the availability of banked NO_x ERCs from the TXI Riverside Cement upgrade project in the MDAQMD.

To offset PHPP PM_{10} emissions, the Project Applicant has identified potential ERCs resulting from the paving of existing unpaved roads. The MDAQMD has previously allowed the use of road paving PM_{10} reductions for New Source Review actions, and the AVAQMD supports the use of road paving PM_{10} reductions to offset natural gas combustion PM_{10} emissions within a PM_{10} non-attainment area. The AVAQMD will analyze road paving ERC quantification and issuance process in a manner similar to the MDAQMD Rule 1406[5] - *Generation of Emission Reduction Credits for Paving Unpaved Public Roads*, to determine the exact amount of ERCs that can be issued to PHPP in response to the paving of any given existing unpaved road segments. Adequate existing unpaved roads are present within the AVAQMD to offset the proposed PHPP.

The proposed PHPP ERC sources are summarized in Table 7. This offset strategy is detailed in the Response to Data Request Set 2 submitted to the CEC on May 1, 2009

Table 7 – ERC Sources Identified by PHPP All emissions in tons per year				
ERC Source	Mechanism	**NO_x**	**VOC**	**PM_{10}**
SJVAPCD or MDAQMD	Transfer ERC to AVAQMD (pending)	>150	>52	
Road Paving	ERC generated within AVAQMD (pending)			>137
Total ERCs potentially Identified:		**>150**	**>52**	**>137**

[5] Although this Rule is currently being reviewed within the MDAQMD related to procedural issues, the calculation methodology remains valid and applicable to the AVAQMD.

Inter-District, Inter-Basin and Inter-Pollutant Offsetting

As summarized above, current VOC and NO_x offset proposals include the use of inter-district and/or inter-basin offsets from the MDAQMD or SJVAPCD. Inter-district trades would entail the use of offsets from other districts within the Mojave Desert Air Basin, e.g., use of NO_x ERC from the MDAQMD bank. Inter-basin trades would entail use of credits from another air district located in a different air basin, e.g., NO_x and VOC ERCs from the San Joaquin Valley Air Basin. AVAQMD Rule 1305(B) explicitly allows for the use of inter-district and inter-basin offsets, as approved by the Air Pollution Control Officer in consultation with CARB and the USEPA, on a case-by-case basis. The Governing Boards of the applicable Districts would have to approve by resolution any inter-basin transfer of ERCs pursuant to Health & Safety Code Section 40709.6(d).

The MDAQMD has previously allowed the use of inter-basin offsets for the High Desert Power Project, the Blythe Energy Project, and the Blythe Energy Project II. In each case CARB and USEPA did not object to the inter-basin trade. The proposed inter-basin trade originates in an air district (SJVAPCD) that is both upwind from, and has a higher ozone non-attainment classification than, the AVAQMD. The South Coast Air Basin and San Joaquin Valley Air Basin have been determined to be a source of overwhelming transport of air pollution into the Mojave Desert Air Basin by CARB[6]; overwhelming in the sense that local emissions are overwhelmed by South Coast and San Joaquin Valley Air Basin emissions being transported into the local area. The nature of the ozone problem at the project site (and within the entire AVAQMD federal ozone attainment area) is a function of ozone and ozone precursor emissions from the SCAQMD and SJVAPCD. The regional nature of the AVAQMD ozone problem has been explicitly and implicitly recognized by both districts, CARB and USEPA since the mid 1990s, as ozone State Implementation Plans (SIPs) submitted and approved by all four agencies include a "but for" attainment demonstration for the AVAQMD. This attainment demonstration indicates that the AVAQMD would be in attainment "but for" ozone and ozone precursors originating within the SCAQMD and SJVAPCD, and that ozone precursor emission reductions within the SCAQMD and SJVAPCD are necessary for the AVAQMD to demonstrate attainment of the Federal standard. The reduction of ERCs within the SJVAPCD and their consumption within the AVAQMD represents a reduction in potential upwind ozone precursors, in direct support of regional ozone attainment efforts. On the basis of this intimate regional ozone relationship, and supported by regional ozone attainment demonstration modeling as presented in every recent regional ozone SIP, the AVAQMD finds that the use of inter-basin ozone precursor offsets from SJVAPCD is technically justified for the PHPP, and finds no technical justification for an inter-district or inter-basin based distance ratio (other than the nominal 1:1).

PHPP originally proposed to use inter-pollutant ERC trading from the SCAQMD to make up for the limited amount of ozone precursor ERCs available within the AVAQMD. One option currently under consideration is the use of inter-pollutant ERCs trading from the MDAQMD (use of NO_x ERCs to offset NO_x and VOC emissions). AVAQMD Rule 1305(B) specifically allows for the use of inter-pollutant offsets (in consultation with CARB and with the approval of USEPA). The MDAQMD has previously approved the use of inter-pollutant ERC trading

[6] "Ozone Transport: 2001 Review," April 2001, CARB identifies the South Coast Air Basin as having an overwhelming and significant impact on the Mojave Desert Air Basin (which includes the Antelope Valley) and the San Joaquin Valley as having an overwhelming impact on the MDAB.

(specifically between VOC and NO_x) for the High Desert Power Project, the Blythe Energy Project, and the Blythe Energy Project II. In each case CARB and USEPA Region IX did not object to the inter-pollutant trade.

If such a trade were to occur, the PHPP proposed to use NO_x ERCs to offset VOC emissions at a 1.6:1 ratio. That proposed inter-pollutant NO_x for VOC ratio for PHPP is consistent with prior inter-pollutant actions. This inter-pollutant ratio was established by agreement between the MDAQMD, SCAQMD, USEPA, CARB and the CEC during the permitting and licensing process for the High Desert Power Project. At that time it was determined that no acceptably accurate project-specific evaluation tool or mechanism existed to quantify a VOC for NO_x ratio for new sources within the MDAQMD, primarily due to the coarseness of regional ozone modeling and the relatively small scale of proposed emission decreases and increases. Both the reduction associated with the ERCs and the increase associated with the new project are less than the sensitivity threshold of regional ozone modeling (the region has an ozone precursor emissions inventory measured in excess of a thousand tons per day). In addition, any net reduction in ozone precursors produces a net benefit to the regional ozone attainment effort, given the established historical efficiency of the region in photochemically producing ozone from existing ozone precursor emissions. The AVAQMD concludes that a NO_x for VOC ratio of 1.6:1 should be acceptable, conservative and technically justified for PHPP if inter-basin, inter-pollutant trading with MDAQMD is contemplated in the future.

If required by USEPA, the Project Applicant plans to work closely with the AVAQMD to develop a rule to allow for the banking of PM_{10} ERCs from the paving of unpaved roads. MDAQMD has developed Rule 1406, which was patterned after a similar rule that was developed by Maricopa County, Arizona Air Quality Department (MCAQD) which has been approved by USEPA. USEPA required a specific rule in these instances because the areas are classified as non-attainment of the Federal PM_{10} standards. Because AVAQMD has not been designated as Federal non-attainment for PM_{10}, PHPP does not require any PM_{10} ERCs under the Federal NSR Program.

As shown in Table 7, the Applicant has indicated that sufficient ERCs can be obtained to meet the offset requirements for the PHPP shown in Table 6 with its current offset strategy. AVAQMD will require that the Applicant demonstrates that sufficient federally enforceable ERCs can be obtained for the project prior to issuance of the final Authority to Construct (ATC) permit. Sufficient federally enforceable ERCs must be surrendered to the AVAQMD for the equipment before the start of construction of any part of the project for which this equipment is intended to be used.

10. Applicable Regulations and Compliance Analysis

Selected AVAQMD Rules and Regulations will apply to the proposed project:

Regulation II – Permits

Rule 212 – Standards For Approving Permits establishes baseline criteria for approving permits by the AVAQMD for certain projects. In accordance with these criteria, the proposed project

accomplishes all required notices and emission limits through the PDOC and complying with stringent emission limitations set forth on permits.

Rule 218 - *Stack Monitoring* requires certain facilities to install and maintain stack monitoring systems. The proposed project will be required to install and maintain stack monitoring systems by permit condition.

Rule 225 – *Federal Operating Permit Requirements* requires certain facilities to obtain federal operating permits. The proposed project will be required to submit an application for a federal operating permit within twelve months of the commencement of operations.

Regulation IV - Prohibitions

Rule 401 – *Visible Emissions* limits visible emissions opacity to less than 20 percent (or Ringelmann No. 1). During start up, visible emissions may exceed 20 percent opacity. However, emissions of this opacity are not expected to last three minutes or longer. In normal operating mode, visible emissions are not expected to exceed 20 percent opacity.

Rule 402 – *Nuisance* prohibits facility emissions that cause a public nuisance. The proposed turbine power train exhaust is not expected to generate a public nuisance due to the sole use of pipeline-quality natural gas as a fuel. In addition, due to the location of the proposed project, no nuisance complaints are expected.

Rule 403 – *Fugitive Dust* specifies requirements for controlling fugitive dust. The proposed project does not include any significant sources of fugitive dust so the proposed project is not expected to violate Rule 403.

Rule 404 – *Particulate Matter – Concentration* specifies standards of emissions for particulate matter concentrations. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 404.

Rule 405 – *Solid Particulate Matter - Weight* limits particulate matter emissions from fuel combustion on a mass per unit combusted basis. The sole use of pipeline-quality natural gas as a fuel will keep proposed project emission levels in compliance with Rule 405.

Rule 408 – *Circumvention* prohibits hidden or secondary rule violations. The proposed project is not expected to violate Rule 408.

Rule 409 – *Combustion Contaminants* limits total particulate emissions on a density basis. The sole use of pipeline-quality natural gas a fuel will keep proposed project emission levels in compliance with Rule 409.

Rule 430 – *Breakdown Provisions* requires the reporting of breakdowns and excess emissions. The proposed project will be required to comply with Rule 430 by permit condition.

Rule 431.1, 431.2 and 431.3 – *Sulfur Content in Fuels* limits sulfur content in gaseous, liquid and solid fuels. The sole use of pipeline-quality natural gas a fuel will keep the proposed project in compliance with Rule 431.

Rule 476 - *Steam Generating Equipment* limits NO_x and particulate matter from steam boilers, including the auxiliary boiler, and specifies monitoring and recordkeeping for such equipment. The proposed project will have specific permit conditions requiring compliance with these provisions.

Regulation IX – Standards of Performance for New Stationary Sources

Regulation IX includes by reference the New Source Performance Standards (NSPS) for New Stationary Combustion Turbines (40 CFR 60 Subpart KKKK), NSPS for Stationary Compression Ignition Internal Combustion Engines (40 CFR 60 Subpart IIII), and NSPS for Industrial-Commercial-Institutional Steam Generating Units (40 CFR 60 Subpart Db). Permit conditions for the proposed project will establish limits which are in compliance with the turbine, auxiliary boiler, and compression ignition engine NSPS referenced in Regulation IX.

Regulation XI - Source Specific Standards

Rule 1113 - *Architectural Coatings* limits VOC content of applied architectural coatings. The proposed project will be required to use compliant coatings by permit condition.

Rule 1134 - Emissions of Oxides of Nitrogen from Stationary Gas Turbines. Limits NO_x emissions from combined-cycle turbines and specifies monitoring and recordkeeping for such equipment. The proposed project will have specific permit conditions requiring compliance with these provisions.

Rule 1135 - Emissions of Oxides of Nitrogen from Electric Power Generating Systems. This rule is only applicable to units existing in 1991 which are owned by specific utilities or their successors. Since PHPP will be constructed after 1991 and is not owned by any entity listed in the rule, this rule is not applicable to PHPP.

Rule 1146 - Emissions of Oxides of Nitrogen from Industrial, Institutional, and Commercial Boilers, Steam Generators, and Process Heaters. This rule does not apply to boilers used to generate electricity, but would apply to the HTF heater. The proposed project will meet the requirements of this rule by implementing the BACT levels discussed previously. The proposed project will have specific permit conditions requiring compliance with these provisions.

Regulation XIII – New Source Review

Rule 1300 – *General* ensures that Prevention of Significant Deterioration (PSD) requirements apply to all projects. The proposed project has submitted an application to the USEPA for a PSD permit that regulates PHPP emissions of NO_2, CO and $PM_{2.5}$, complying with Rule 1300.

Rule 1302 – *Procedure* requires certification of compliance with the Federal Clean Air Act, applicable implementation plans, and all applicable AVAQMD rules and regulations. The ATC application package for the proposed project includes sufficient documentation to comply with

Rule 1302(D)(5)(b)(iii). Permit conditions for the proposed project will require compliance with Rule 1302(D)(5)(b)(iv).

Rule 1303 – *Requirements* requires BACT and offsets for selected large new sources. Permit conditions will limit the emissions from the proposed project to a level which has been defined as BACT for the proposed project, bringing the proposed project into compliance with Rule 1302(A). Prior to the commencement of construction the proposed project shall have obtained sufficient offsets to comply with Rule 1303(B)(1).

Rule 1305 – *Emissions Offsets* provides the procedures and formulas to determine the eligibility, calculations and use of Offsets required pursuant to the provisions of District Rile 1303 (B). Fugitive Emissions, as defined in Rule 1301 (HH), will be included when calculating the base quantity of offsets as required by Rule 1305.

Rule 1306 – *Electric Energy Generating Facilities* places additional administrative requirements on projects involving approval by the California Energy Commission (CEC). The proposed project will not receive an ATC without CEC's approval of their Application for Certification, ensuring compliance with Rule 1306.

Regulation XXX – Federal Operating Permits

Regulation XII contains requirements for sources which must have a federal operating permit and an acid rain permit. The proposed project will be required to submit applications for a federal operating permit and an acid rain permit by the appropriate date. The federal operating permit application is required to be submitted within one year after the PHPP commences operation. An acid rain permit application is required by 40 CFR Part 72 to be submitted at least 24 months prior to the date when the affected unit commences commercial operation.

Maximum Achievable Control Technology Standards

Health & Safety Code §39658(b)(1) states that when USEPA adopts a standard for a toxic air contaminant pursuant to §112 of the Federal Clean Air Act (42 USC §7412), such standard becomes the Airborne Toxic Control Measure (ATCM) for the toxic air contaminant. Once an ATCM has been adopted it becomes enforceable by the AVAQMD 120 days after adoption or implementation (Health & Safety Code §39666(d)). USEPA has not to date adopted a Maximum Achievable Control Technology (MACT) standard that is applicable to the proposed project. Should USEPA adopt an applicable MACT standard in the future, the AVAQMD will be required to enforce said MACT as an ATCM on the proposed project. MACT is also required for each major source of toxic air contaminants. PHPP will not emit more than ten tons per year of any individual toxic air contaminant, and will not collectively emit more than 25 tons per year of all toxic air contaminants, so MACT is not required.

11. Conclusion

The AVAQMD has reviewed the proposed project's Application for New Source Review and subsequent supplementary information. The AVAQMD has determined that the proposed

project, after application of the permit conditions (including BACT/LAER requirements) given below, will comply with all applicable AVAQMD Rules and Regulations. This FDOC will be publicly noticed no later than May 16, 2010, including copies to USEPA, CARB and CEC. Written comments will be accepted for thirty days from the date of publication of the public notice. This FDOC will remain available for public inspection.

12. Permit Conditions

The following permit conditions will be placed on the Authorities to Construct (ATC) for the project. Separate permits will be issued for each turbine power train. Separate permits will also be issued for each oxidation catalyst, SCR system, duct burner, cooling tower, auxiliary boiler, HTF heater and emergency internal combustion engine. The electronic version of this document contains a set of conditions that are essentially identical for each of multiple pieces of equipment, differing only in AVAQMD permit reference numbers. The signed and printed ATCs will have printed permits (with descriptions and conditions) in place of condition language listings.

Combustion Turbine Generator Power Block Authority to Construct Conditions

[2 individual 1736.4 MMBtu/hr F Class Gas Combustion Turbine Generators, Application Numbers: 00010013 and 00010014]

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

2. This equipment shall be exclusively fueled with pipeline quality natural gas with a sulfur content not exceeding 0.2 grains per 100 dscf on a rolling twelve month average basis, and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles. Compliance with this limit shall be demonstrated by providing evidence of a contract, tariff sheet or other approved documentation that shows that the fuel meets the definition of pipeline quality gas.

3. This equipment is subject to the Federal NSPS codified at 40 CFR Part 60, Subparts A (General Provisions) and KKKK (Standards of Performance for New Stationary Gas Turbines). This facility is also subject to the Prevention of Significant Deterioration (40 CFR 52.21) and Federal Acid Rain (Title IV) programs. Compliance with all applicable provisions of these regulations is required.

4. Emissions from this equipment (including its associated duct burner) shall not exceed the following emission limits at any firing rate, except for CO, NO_x and VOC during periods of startup, shutdown and malfunction:
   a. Hourly rates, computed every 15 minutes, verified by CEMS and annual compliance tests:
      i. NO_x as NO_2 – 16.60 lb/hr (based on 2.0 ppmvd corrected to 15% O_2 and averaged over one hour)
      ii. CO – 15.15 lb/hr (based on 2.0 ppmvd (3.0 ppmvd with duct firing) corrected to 15% O_2 and averaged over one hour)

b. Hourly rates, verified by annual compliance tests or other compliance methods in the case of SOx:
   i. VOC as CH_4 – 5.80 lb/hr (based on 1.4 ppmvd (2.0 ppmvd with duct firing) corrected to 15% O_2)
   ii. SO_x as SO_2 – 1.29 lb/hr (based on 0.2 grains/100 dscf fuel sulfur)
   iii. $PM_{10/2.5}$ – 18.0 lb/hr

5. Emissions of CO and NO_x from this equipment shall only exceed the limits contained in Condition 4 during startup and shutdown periods as follows:
   a. Startup is defined as the period beginning with ignition and lasting until the equipment has reached operating permit limits, i.e., the applicable emission limits listed in condition 4. Cold startup is defined as a startup when the CTG has not been in operation during the preceding continuous 48 hours, although a startup after an aborted partial cold start (a cold start that does not reach 85% output) is still considered a cold start. Other startup is defined as a startup that is not a cold startup. Shutdown is defined as the period beginning with the lowering of equipment from base load and lasting until fuel flow is completely off and combustion has ceased.
   b. Transient conditions shall not exceed the following durations:
      i. Cold startup – 110 minutes
      ii. Other startup – 80 minutes
      iii. Shutdown – 30 minutes
   c. During a cold startup emissions shall not exceed the following, verified by CEMS:
      i. NO_x – 96 lb
      ii. CO – 410 lb
   d. During any other startup emissions shall not exceed the following, verified by CEMS:
      i. NO_x – 40 lb
      ii. CO – 329 lb
   e. During a shutdown emissions shall not exceed the following, verified by CEMS:
      i. NO_x – 57 lb
      ii. CO – 337 lb

6. Emissions from this facility, including the duct burner, auxiliary equipment, engines, cooling tower, shall not exceed the following emission limits, based on a calendar day summary:
   a. NO_x – 1359 lb/day, verified by CEMS
   b. CO – 4833 lb/day, verified by CEMS
   c. VOC as CH_4 – 577 lb/day, verified by compliance tests and hours of operation in mode
   d. SO_x as SO_2 – 64 lb/day, verified by fuel sulfur content and fuel use data
   e. $PM_{10/2.5}$ – 931 lb/day, verified by compliance tests and hours of operation

7. Emissions from this facility, including the duct burner, auxiliary equipment, engines, cooling tower and fugitive dust for vehicle use in the solar field, shall not exceed the following emission limits, based on a rolling 12 month summary:
   a. NO_x – 115 tons/year, verified by CEMS
   b. CO – 255 tons/year, verified by CEMS

c. VOC as CH_4 – 40 tons/year, verified by compliance tests and hours of operation in mode
d. SO_x as SO_2 – 9 tons/year, verified by fuel sulfur content and fuel use data
e. PM_{10} – 128 tons/year, verified by compliance tests and hours of operation
f. $PM_{2.5}$ – 125 tons/year, verified by compliance tests and hours of operation

8. Particulate emissions from this equipment shall not exceed an opacity equal to or greater than twenty percent (20%) for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor (Rule 401-*Visible Emissions*).

9. This equipment shall exhaust through a stack at a minimum height of 145 feet.

10. The owner/operator (o/o) shall not operate this equipment after the initial commissioning period without the oxidation catalyst with valid District permit C00nnnn and the selective catalytic reduction system with valid District permit C00nnnn installed.

11. The o/o shall provide stack sampling ports and platforms necessary to perform source tests required to verify compliance with District rules, regulations and permit conditions. The location of these ports and platforms shall be subject to District approval.

12. Emissions of NO_x, CO, oxygen and ammonia slip shall be monitored using a Continuous Emissions Monitoring System (CEMS). Turbine fuel consumption shall be monitored using a continuous monitoring system. Stack gas flow rate shall be monitored using either a Continuous Emission Rate Monitoring System (CERMS) meeting the requirements of 40 CFR 75 Appendix A or a stack flow rate calculation method. The o/o shall install, calibrate, maintain, and operate these monitoring systems according to a District-approved monitoring plan, AVAQMD Rule 218, 40 CFR 60 and/or 40 CFR 75[7] as applicable.

13. The o/o shall conduct all required compliance/certification tests in accordance with a District-approved test plan. Thirty (30) days prior to the compliance/certification tests the operator shall provide a written test plan for District review and approval. Written notice of the compliance/certification test shall be provided to the District ten (10) days prior to the tests so that an observer may be present. A written report with the results of such compliance/certification tests shall be submitted to the District within forty-five (45) days after testing.

14. The o/o shall perform the following annual compliance tests on this equipment in accordance with the AVAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:
a. NO_x as NO_2 in ppmvd at 15% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).
b. VOC as CH_4 in ppmvd at 15% oxygen and lb/hr (measured per USEPA Reference Methods 25A and 18).
c. SO_x as SO_2 in ppmvd at 15% oxygen and lb/hr.

[7] Where 40 CFR 60 and 40 CFR 75 are applicable but inconsistent, 40 CFR 75 shall take precedent.

d. CO in ppmvd at 15% oxygen and lb/hr (measured per USEPA Reference Method 10).
e. PM_{10} and $PM_{2.5}$ in mg/m^3 at 15% oxygen and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).
f. Flue gas flow rate in dscf per minute.
g. Opacity (measured per USEPA reference Method 9).
h. Ammonia slip in ppmvd at 15% oxygen.

15. The o/o shall, at least as often as once every five years (commencing with the initial compliance test), include the following supplemental source tests in the annual compliance testing:
    a. Characterization of cold startup VOC emissions;
    b. Characterization of other startup VOC emissions; and
    c. Characterization of shutdown VOC emissions.

16. Continuous monitoring systems shall meet the following acceptability testing requirements from 40 CFR 60 Appendix B (or otherwise District approved):
    a. For NO_x, 40 CFR 75
    b. For O_2, Performance Specification 3.
    c. For CO, Performance Specification 4.
    d. For stack gas flow rate, 40 CFR 75
    e. For ammonia, a District approved procedure that is to be submitted by the o/o.
    f. For stack gas flow rate (without CERMS), a District approved procedure that is to be submitted by the o/o.

17. The o/o shall submit to the APCO and USEPA Region IX the following information for the preceding calendar quarter by January 30, April 30, July 30 and October 30 of each year this permit is in effect. Each January 30 submittal shall include a summary of the reported information for the previous year. This information shall be maintained on site and current for a minimum of five (5) years and shall be provided to District personnel on request:
    a. Operating parameters of emission control equipment, including but not limited to ammonia injection rate, NO_x emission rate and ammonia slip.
    b. Total plant operation time (hours), duct burner operation time (hours), number of startups, hours in cold startup, hours in other startup, and hours in shutdown.
    c. Date and time of the beginning and end of each startup and shutdown period.
    d. Average plant operation schedule (hours per day, days per week, weeks per year).
    e. All continuous emissions data reduced and reported in accordance with the District-approved CEMS protocol.
    f. Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, PM_{10}, $PM_{2.5}$, VOC and SO_x (including calculation protocol).
    g. Fuel sulfur content (monthly laboratory analyses, monthly natural gas sulfur content reports from the natural gas supplier(s), or the results of a custom fuel monitoring schedule approved by USEPA for compliance with the fuel monitoring provisions of 40 CFR 60 Subpart KKKK and 40 CFR Part 72 as applicable)
    h. A log of all excess emissions, including the information regarding malfunctions/breakdowns required by Rule 430.

i. Any permanent changes made in the plant process or production which would affect air pollutant emissions, and indicate when changes were made.
j. Any maintenance to any air pollutant control system (recorded on an as-performed basis).

18. The o/o must surrender to the District sufficient valid Emission Reduction Credits for this equipment before the start of construction of any part of the project for which this equipment is intended to be used. In accordance with Regulation XIII the operator shall obtain 150 tons of NO_x, 52 tons of VOC, and 128 tons of PM_{10} offsets.

19. During an initial commissioning period of no more than 180 days, commencing with the first firing of fuel in this equipment, NO_x, CO, VOC and ammonia concentration limits shall not apply. The o/o shall minimize emission of NO_x, CO, VOC and ammonia to the maximum extent possible during the initial commissioning period.

20. The o/o shall tune each CTG and HRSG to minimize emissions of criteria pollutants at the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor.

21. The o/o shall install, adjust and operate each SCR system to minimize emissions of NO_x from the CTG and HRSG at the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor. The NO_x and ammonia concentration limits of condition #4 above and condition #4 (CXXXXX) respectively shall apply coincident with the steady state operation of the SCR systems.

22. The o/o shall submit a commissioning plan to the District and the CEC at least four weeks prior to the first firing of fuel in this equipment. The commissioning plan shall describe the procedures to be followed during the commissioning of the CTGs, HRSGs and steam turbine. The commissioning plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the dry low NO_x combustors, the installation and testing of the CEMS, and any activities requiring the firing of the CTGs and HRSGs without abatement by an SCR system.

23. The total number of firing hours of each CTG and HRSG without abatement of NO_x by the SCR shall not exceed 624 hours during the initial commissioning period. Such operation without NO_x abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place and operating. Upon completion of these activities, the o/o shall provide written notice to the District and CEC and the unused balance of the unabated firing hours shall expire.

24. During the initial commissioning period, emissions from this facility shall not exceed the following emission limits (verified by CEMS):
a. NO_x - 32 tons, and 242 pounds/hour/CTG
b. CO - 118 tons, and 1337 pounds/hour/CTG

25. Within 60 days after achieving the maximum firing rate at which the facility will be operated, but not later than 180 days after initial startup, the operator shall perform an initial compliance test. This test shall demonstrate that this equipment is capable of operation at 100% load in compliance with the emission limits in Condition 4.

26. The initial compliance test shall include tests for the following. The results of the initial compliance test shall be used to prepare a supplemental health risk analysis if required by the District:
    a. PAH;
    b. Certification of CEMS and CERMS (or stack gas flow calculation method) at 100% load, startup modes and shutdown mode;
    c. Characterization of cold startup VOC emissions;
    d. Characterization of other startup VOC emissions; and
    e. Characterization of shutdown VOC emissions.

HRSG Duct Burner Authority to Construct Conditions

[2 individual 424.3 MMBtu/hr Natural Gas Duct Burners,
Application Numbers: 00000000 and 00000000]

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

2. This equipment shall be exclusively fueled with pipeline quality natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The duct burner shall not be operated unless the combustion turbine generator with valid District permit #, catalytic oxidation system with valid District permit #, and selective catalytic NO_x reduction system with valid District permit # are in operation.

4. This equipment shall not be operated for more than 2000 hours per rolling twelve month period.

5. Monthly hours of operation for this equipment shall be recorded and maintained on site for a minimum of five (5) years and shall be provided to District personnel on request.

Oxidation Catalyst System Authority to Construct Conditions

[2 individual oxidation catalyst systems, Application Numbers: 0010011 and 0010012]

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

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment shall be operated concurrently with the combustion turbine generator with valid District permit B00nnnn.

Selective Catalytic Reduction System Authority to Construct Conditions

[2 individual SCR systems, Application Numbers: 0010011 and 0010012]

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

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment shall be operated concurrently with the combustion turbine generator with valid District permit B00nnnn.

4. Ammonia shall be injected whenever the selective catalytic reduction system has reached or exceeded 550° Fahrenheit except for periods of equipment malfunction. Except during periods of startup, shutdown and malfunction, ammonia slip shall not exceed 5 ppmvd (corrected to 15% O_2), averaged over three hours.

5. The owner/operator shall record and maintain for this equipment the following on site for a minimum of five (5) years and shall be provided to District personnel upon request.
   a. Ammonia injection, in pounds per hour
   b. Temperature, in degrees Fahrenheit.

Cooling Tower Authority to Construct Conditions

[One Cooling Tower, Application Number: 0010019]

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

2. This equipment shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. The drift rate shall not exceed 0.0005 percent with a maximum circulation rate of 130,000 gallons per minute. The maximum hourly PM_{10} emission rate shall not exceed 1.63 pounds per hour, as calculated per the written District-approved protocol.

4. The operator shall perform weekly tests of the blow-down water total dissolved solids (TDS). The TDS shall not exceed 5000 ppm on a calendar monthly basis. The operator shall maintain a log which contains the date and result of each blow-down water test in

TDS ppm, and the resulting mass emission rate. This log shall be maintained on site for a minimum of five (5) years and shall be provided to District personnel on request.

5. The operator shall conduct all required cooling tower water tests in accordance with a District-approved test and emissions calculation protocol. Thirty (30) days prior to the first such test the operator shall provide a written test and emissions calculation protocol for District review and approval.

6. A maintenance procedure shall be established that states how often and what procedures will be used to ensure the integrity of the drift eliminators. This procedure is to be kept on-site and available to District personnel on request.

Auxiliary Boiler Authority to Construct Conditions

[One 110 MMBtu/hr Gas Fired Auxiliary Boiler, Application Number: 0010018]

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

2. This equipment shall be exclusively fueled with pipeline quality natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. This equipment is subject to the Federal NSPS codified at 40 CFR Part 60, Subparts A (General Provisions) and Db (Industrial-Commercial-Institutional Steam Generating Units).

4. Emissions from this equipment shall not exceed the following hourly emission limits at any firing rate, verified by fuel use and annual compliance tests:
   a. NO_x as NO_2 – 1.21 lb/hr (based on 9.0 ppmvd corrected to 3% O_2 and averaged over one hour)
   b. CO – 4.05 lb/hr (based on 50 ppmvd corrected to 3% O_2 and averaged over one hour)
   c. VOC as CH_4 – 0.59 lb/hr
   d. SO_x as SO_2 – 0.06 lb/hr (based on 0.2 grains/100 dscf fuel sulfur)
   e. $PM_{10/2.5}$ – 0.82 lb/hr (front and back half)

5. This equipment shall not be operated for more than 500 hours per rolling twelve month period

6. The o/o shall maintain an operations log for this equipment on-site and current for a minimum of five (5) years, and said log shall be provided to District personnel on request. The operations log shall include the following information at a minimum:
   a. Total operation time (hours per month, by month);
   b. Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, $PM_{10/2.5}$, VOC and SO_x (including calculation protocol); and,

c. Any permanent changes made to the equipment that would affect air pollutant emissions, and indicate when changes were made.

7. The o/o shall perform the following annual compliance tests on this equipment in accordance with the AVAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:
   a. NO_x as NO_2 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).
   b. VOC as CH_4 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 25A and 18).
   c. SO_x as SO_2 in ppmvd at 3% oxygen and lb/hr.
   d. CO in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Method 10).
   e. PM_{10} and $PM_{2.5}$ in mg/m^3 at 3% oxygen and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).f. Flue gas flow rate in dscf per minute.
   g. Opacity (measured per USEPA reference Method 9).

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

HTF Heater Authority to Construct Conditions

[One 40 MMBtu/hr Gas Fired HTF Heater, Application Number: 0010017]

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

2. This equipment shall be exclusively fueled with pipeline quality natural gas and shall be operated and maintained in strict accord with the recommendations of its manufacturer or supplier and/or sound engineering principles.

3. Emissions from this equipment shall not exceed the following hourly emission limits at any firing rate, verified by fuel use and annual compliance tests:
   a. NO_x as NO_2 – 0.44 lb/hr (based on 9.0 ppmvd corrected to 3% O_2 and averaged over one hour)
   b. CO – 1.47 lb/hr (based on 50 ppmvd corrected to 3% O_2 and averaged over one hour)
   c. VOC as CH_4 – 0.22 lb/hr
   d. SO_x as SO_2 – 0.02 lb/hr (based on 0.2 grains/100 dscf fuel sulfur)
   e. $PM_{10/2.5}$ – 0.30 lb/hr (front and back half)

4. This equipment shall not be operated for more than 1000 hours per rolling twelve month period.

5. The o/o shall maintain an operations log for this equipment on-site and current for a minimum of five (5) years, and said log shall be provided to District personnel on request. The operations log shall include the following information at a minimum:

a. Total operation time (hours per month, by month);
b. Maximum hourly, maximum daily, total quarterly, and total calendar year emissions of NO_x, CO, $PM_{10/2.5}$, VOC and SO_x (including calculation protocol); and,
c. Any permanent changes made to the equipment that would affect air pollutant emissions, and indicate when changes were made.

6. The o/o shall perform the following annual compliance tests on this equipment in accordance with the AVAQMD Compliance Test Procedural Manual. The test report shall be submitted to the District no later than six weeks prior to the expiration date of this permit. The following compliance tests are required:
   a. NO_x as NO_2 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 19 and 20).
   b. VOC as CH_4 in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Methods 25A and 18).
   c. SO_x as SO_2 in ppmvd at 3% oxygen and lb/hr.
   d. CO in ppmvd at 3% oxygen and lb/hr (measured per USEPA Reference Method 10).
   e. PM_{10} and $PM_{2.5}$ in mg/m^3 at 3% oxygen and lb/hr (measured per USEPA Reference Methods 5 and 202 or CARB Method 5).
   f. Flue gas flow rate in dscf per minute.
   g. Opacity (measured per USEPA reference Method 9).

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

Emergency Generator Authority to Construct Conditions

[One 2683 hp emergency IC engine driving a generator, Application Number: 0010015]

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

2. This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants.

3. This unit shall be limited to use for emergency power, defined as in response to a fire or when utility back-feed power is not available.. In addition, this unit may be operated as part of a testing program that does not exceed 50 hours of testing or maintenance per calendar year. Furthermore, pursuant to District Rule 1110.2, this unit shall be operated less than 200 hours per calendar year. This requirement includes usage during emergencies.

4. This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 15 ppm on a weight basis per CARB Diesel or equivalent requirements. Note, a fuel switch to an alternative liquid fuel may be subject to permit applicability and must be processed accordingly.

5. A non-resettable four digit hour timer shall be installed and maintained on this unit to indicate elapsed engine operating time.

6. The owner/operator shall maintain a log for this unit, which, at a minimum, contains the information specified below. This log shall be maintained current and on-site for a minimum of five (5) years and shall be provided to District personnel on request:
   a. Date of each use or test;
   b. Duration of each use or test in hours;
   c. Reason for each use;
   d. Cumulative calendar year use, in hours; and,
   e. 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 equipment shall comply with the applicable requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115).

Emergency Fire Suppression Water Pump Authority to Construct Conditions

[One 182 hp emergency IC engine driving a fire suppression water pump, Application Number: 0010016]

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

2. This equipment shall be installed, operated and maintained in strict accord with those recommendations of the manufacturer/supplier and/or sound engineering principles which produce the minimum emissions of contaminants.

3. This unit shall be limited to use for emergency fire fighting. In addition, this unit may be operated as part of a testing program that does not exceed 50 hours of testing or maintenance per calendar year. Furthermore, pursuant to District Rule 1110.2, this unit shall be operated less than 200 hours per calendar year. This requirement includes usage during emergencies.

4. This unit shall only be fired on ultra-low sulfur diesel fuel, whose sulfur concentration is less than or equal to 15 ppm on a weight basis per CARB Diesel or equivalent requirements. Note, a fuel switch to an alternative liquid fuel may be subject to permit applicability and must be processed accordingly.

5. A non-resettable four digit hour timer shall be installed and maintained on this unit to indicate elapsed engine operating time.

6. The owner/operator shall maintain a log for this unit, which, at a minimum, contains the information specified below. This log shall be maintained current and on-site for a minimum of five (5) years and shall be provided to District personnel on request:

a. Date of each use or test;
b. Duration of each use or test in hours;
c. Reason for each use;
d. Cumulative calendar year use, in hours; and,
e. 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 equipment shall comply with the applicable requirements of the Airborne Toxic Control Measure (ATCM) for Stationary Compression Ignition Engines (Title 17 CCR 93115).

Appendix - PHPP Emissions Calculations

PHPP Combustion Equipment Emission Rates By Temperature									
	Temp	Conc Limit *(ppmvd @ 15%)*			Hourly Emissions pounds				
Device	*deg F*	NOx	CO	VOC	NOx	CO	VOC	SOx	PM10
Turbine	23	2.0	2	1.4	13.47	8.20	4.70	1.05	12.0
Turbine	59	2.0	2	1.4	12.79	7.78	4.46	0.99	12.0
Turbine	64	2.0	2	1.4	12.77	7.78	4.45	0.99	12.0
Turbine	98	2.0	2	1.4	12.29	7.48	4.29	0.95	12.0
Turbine	108	2.0	2	1.4	12.17	7.41	4.24	0.95	12.0
Duct Burner/No Solar	23	2.0	1	0.6	3.13	6.96	1.09	0.24	6.0
Duct Burner/No Solar	59	2.0	1	0.6	3.24	6.86	1.13	0.25	6.0
Duct Burner/Max Solar	64	2.0	1	0.6	0.89	4.70	0.31	0.07	6.0
Duct Burner/Max Solar	98	2.0	1	0.6	0.92	4.59	0.32	0.07	6.0
Duct Burner/Max Solar	108	2.0	1	0.6	0.93	4.55	0.32	0.07	6.0
Aux Boiler	Any	9.0	50		1.21	4.05	0.59	0.06	0.82
HTF Heater	Any	9.0	50		0.44	1.47	0.22	0.023	0.30
Genset	Any				26.79	15.42	1.41	0.029	0.89
Fire Pump	Any				1.14	1.05	0.06	0.002	0.06
Turbine and Duct Burner/Max Solar	23	2.0	1	0.6	14.35	13.10	5.00	1.11	18.0
Turbine and Duct Burner/Max Solar	59	2.0	1	0.6	13.68	12.48	4.77	1.06	18.0
Turbine and Duct Burner/Max Solar	64	2.0	1	0.6	13.67	12.48	4.77	1.06	18.0
Turbine and Duct Burner/Max Solar	98	2.0	1	0.6	13.21	12.07	4.61	1.03	18.0
Turbine and Duct Burner/Max Solar	108	2.0	1	0.6	13.10	11.96	4.57	1.02	18.0
Turbine and Duct Burner/No Solar	23	2.0	1	0.6	16.60	15.16	5.79	1.29	18.0
Turbine and Duct Burner/No Solar	59	2.0	1	0.6	16.03	14.64	5.59	1.25	18.0
Turbine and Duct Burner/No Solar	64	2.0	1	0.6	16.03	14.64	5.59	1.25	18.0
Turbine and Duct Burner/No Solar	98	2.0	1	0.6	15.72	14.36	5.48	1.22	18.0
Turbine and Duct Burner/No Solar	108	2.0	1	0.6	15.62	14.27	5.45	1.22	18.0

PHPP Transient (Startup and ShutDown) Emission Rates						
	Duration	NOx	CO	VOC	SO2	PM
Pounds per Turbine per Transient Event:						
Cold	110	96	410	31	2	33
Not Cold	80	40	329	28	1	24
Shutdown	30	57	337	29	0	9
Pounds per Hour:						
Cold		52.36	223.64	16.91	0.89	18.0
Not Cold		30.00	246.75	21.00	0.89	18.0
Shutdown		114.00	674.00	58.00	0.89	18.0

PHPP Hourly SOx Emissions By Device							
	units	Turbine	Duct Burner	Aux Boiler	HTF Heater	Genset	Pump
Av Max heat input	MMBTU/hr	1599.6	424.3	110	40	2682	182
Av Max fuel use	scf/hr	1562109	414355	107422	39063		
Sulfur	grains/hr	3124	829	215	78		
Sulfur	lb/hr	0.45	0.12	0.03	0.01		
As SO2	lb/hr	0.89	0.24	0.06	0.02	0.029	0.002

Av max heat input based on annual average 64 degree F at 100% load
Calculation assumes natural gas parameters 1024 BTU/scf and 0.2 gr/100 dscf
Engines are rated in horsepower, engine SOx emissions assume 15 ppm Diesel

	units	Turbine
Max heat input	MMBTU/hr	1763.87
Max fuel use	scf/hr	1722529
Sulfur	grains/hr	3445
Sulfur	lb/hr	0.49
As SO2	lb/hr	0.98

Absolute max heat input based on maximum 23 degree F at 100% load condition

PHPP Cooling Tower Emissions		
Flow Rate	*gallons/minute*	130000
Mass Flow Rate	*pounds/minute*	1084889
Max Drift Rate	*Percentage*	0.0005
Drift Rate	*pounds/minute*	5.42
Max Solids	*TDS (ppm)*	5000
PM Rate	*pounds PM/minute*	0.03
PM Rate	*pounds PM/hour*	1.63
PM10 Rate	*pounds PM10/hour*	1.63
PM2.5 Rate	*pounds PM2.5/hour*	1.63

Notes:
Drift rate assumes 0.0005 percent (mist eliminators)
PM10 & PM2.5 assumes 100 percent PM

PHPP Maximum Potential to Emit						
	NOx	CO	VOC	SOx	PM10	PM2.5
Annual with Transients (tons)	90	255	38	5	84	81
Annual by hours (tons)	115	80	40	9	127	125
Max Annual (tons)	**115**	**255**	**40**	**9**	**127**	**125**
Daily with Transients (pounds)	1359	4853	577	59	931	
Daily by hours (pounds)	864	877	299	64	931	
Max Daily (pounds)	**1359**	**4853**	**577**	**64**	**931**	

Maximum Annual Emissions with Startups/Shutdowns:

		min	total	pounds per hour					
	No.	per	hours	NOx	CO	VOC	SOx	PM10	PM2.5
Cold Start	50	110	91.7	52.36	223.64	16.91	0.89	18.0	18.0
Cold Start Downtime	50	2880	2400.0						
Other Start	260	80	346.7	30.00	246.75	21.00	0.89	18.0	18.0
Other Start Downtime	260	360	1560.0						
Shutdown	310	30	155.0	114.00	674.00	58.00	0.89	18.0	18.0
Operation			4206.7	12.77	7.78	4.45	0.99	12.0	12.0
Total Single Turbine Hours:			8760.0						
Duct Burner			2000.00	0.89	4.70	0.31	0.07	6.00	6.00
Auxiliary Boiler			500.00	1.21	4.05	0.59	0.06	0.82	0.82
HTF Heater			1000.00	0.44	1.47	0.22	0.02	0.30	0.30
Genset			50.00	26.79	15.42	1.41	0.03	0.89	0.89
Fire Pump			50.00	1.14	1.05	0.06	0.00	0.06	0.06
Cooling Tower			8760.00	0.00	0.00	0.01	0.00	1.63	1.63
Vehicle Fugitive Emissions (pounds per year)								5728	573
Facility Annual Total (pounds)				179236	509581	75068	9740.8	167058	161903
Facility Annual Total (tons)				**90**	**255**	**38**	**5**	**84**	**81**

Notes:
Facility includes two turbines and HRSG/duct burners
Operation NOx, CO and VOC estimated using 64 deg F at 100% load, max solar
Operation SOx estimated as SO2 using 0.2 gr/100 dscf
Operation PM10 uses estimate for front and back half
Startup and shutdown NOx, CO and VOC emissions using GE data
Annual hours assumes minimum outage length prior to operations
Fugitive Emissions (pounds per year) are included in Annual Emissions for offset calculations
Calculations of natural gas fired equipment based on High Heating Value of 1,024 Btu/scf

Maximum Daily Emissions with Startups/Shutdowns:

		min	total	pounds per hour				
	No.	per	hours	NOx	CO	VOC	SOx	PM10
Cold Start	1	110	1.8	52.36	223.64	16.91	0.89	18.0
Other Start	2	80	2.7	30.00	246.75	21.00	0.89	18.0
Shutdown	3	30	1.5	114.00	674.00	58.00	0.89	18.0
Operation			18.0	13.47	8.20	4.70	1.05	12.0
Total Single Turbine Hours:			24.0					
Duct Burner			18.0	3.13	6.96	1.09	0.24	6.00
Auxiliary Boiler			24	1.21	4.05	0.59	0.06	0.82
HTF Heater			24	0.44	1.47	0.22	0.02	0.30
Genset			1	26.79	15.42	1.41	0.03	0.89
Fire Pump			1	1.14	1.05	0.06	0.00	0.06
Cooling Tower			24	0.0	0.0	0.0	0.0	1.6
Facility Daily Total (pounds)				**1359**	**4853**	**577**	**59**	**931**

Notes:
No outages
Duct Burners will not operate during startup and shutdown
Facility includes two turbines and HRSG/duct burners
Operation NOx, CO and VOC estimated using 23 deg F at 100% load, no solar
Operation SOx estimated as SO2 using 0.2 gr/100 dscf
Operation PM10 uses estimate for front and back half
Calculations of natural gas fired equipment based on High Heating Value of 1,024 Btu/scf
Startup and shutdown NOx, CO and VOC emissions using GE data

PHPP Maximum Facility Emissions without Transients (Startup/Shutdown)							
PHPP Maximum Annual Emissions by Operation Hours							
	Hrs	NOx	CO	VOC	SOx	PM10	PM2.5
Turbine	8760	12.77	7.78	4.45	0.99	12.00	12.00
Duct Burner	2000	0.89	4.70	0.31	0.070	6.00	6.00
Auxiliary Boiler	500	1.21	4.05	0.59	0.06	0.82	0.82
HTF Heater	1000	0.44	1.47	0.22	0.023	0.30	0.30
Genset	50	26.79	15.42	1.41	0.029	0.89	0.89
Fire Pump	50	1.14	1.05	0.06	0.002	0.06	0.06
Cooling Tower	8760	0.00	0.00	0.01	0.00	1.63	1.63
Fugitive Emissions (pounds/yr)						5728	573
Facility Annual Total (pounds)		229832	159384	79992	17717	254978	249823
Facility Annual Total (tons)		**114.9**	**79.7**	**40.0**	**8.9**	**127.5**	**124.9**
Same assumptions as with transients for operation hours							
Maximum Daily Emissions by Operation Hours:							
	Hrs	NOx	CO	VOC	SOx	PM10	PM2.5
Turbine	24	13.47	8.20	4.70	1.05	12.00	12.00
Duct Burner	24	3.13	6.96	1.09	0.24	6.00	6.00
Auxiliary Boiler	24	1.21	4.05	0.59	0.06	0.82	0.82
HTF Heater	24	0.44	1.47	0.22	0.023	0.30	0.30
Genset	1	26.79	15.42	1.41	0.029	0.89	0.89
Fire Pump	1	1.14	1.05	0.06	0.002	0.06	0.06
Cooling Tower	24	0.00	0.00	0.01	0.00	1.63	1.63
Facility Daily Total (pounds)		**864**	**877**	**299**	**64**	**931**	**931**
Same assumptions as with transients for operation hours							

PHPP Maintenance Vehicle Fugitive Emissions

Vehicle	Distance (Miles/yr)	Distance (Miles/day)	Daily Emissions PM10 (lbs/day)	Daily Emissions PM2.5 (lbs/day)	Annual Emissions PM10 (tpy)	Annual Emissions PM2.5 (tpy)
Mirror Wash Truck	600	4.8	2.62	0.26	0.16	0.02
Maintenance Vehicles	19200	76.8	21.30	2.13	2.66	0.27
Weed Abatement	68	40	21.83	2.18	0.02	0.00
Soil Stabilizer Application	68	40	21.83	2.18	0.02	0.00
Total			67.59	6.76	2.86	0.29

Fugitive Dust Emission Factors

Vehicle Use	Vehicle Type	Vehicle Weight (tons)	Emission Factors PM10 (lb/mi)	Emission Factors PM2.5 (lb/mi)
Mirror Wash Truck	Water Trucks, Freightliner 4000 gallon	13.5	0.55	0.05
Maintenance Vehicles	On-Site 3/4 Ton Pick-Up, Ford	3	0.28	0.03
Weed Abatement	Water Trucks, Freightliner 4000 gallon	13.5	0.55	0.05
Soil Stabilizer Application	Water Trucks, Freightliner 4000 gallon	13.5	0.55	0.05

Notes / Assumptions

EF = k (s/12)a (W/3)b (1-CE/100)

k =	1.5	Particle size multiplier for PM10
	0.15	Particle size multiplier for PM2.5
a =	0.9	for PM10 and PM2.5
b =	0.45	for PM10 and PM2.5
s = surface silt content =	11%	Default conservative silt content from MDAQMD guidance
W = mean vehicle weight		
CE =	80%	Based on quarterly application of dust suppressant

Vehicle weights for the mirror wash, weed abatement and soil stabilizer application trucks is the average of a full truck and an empty truck.

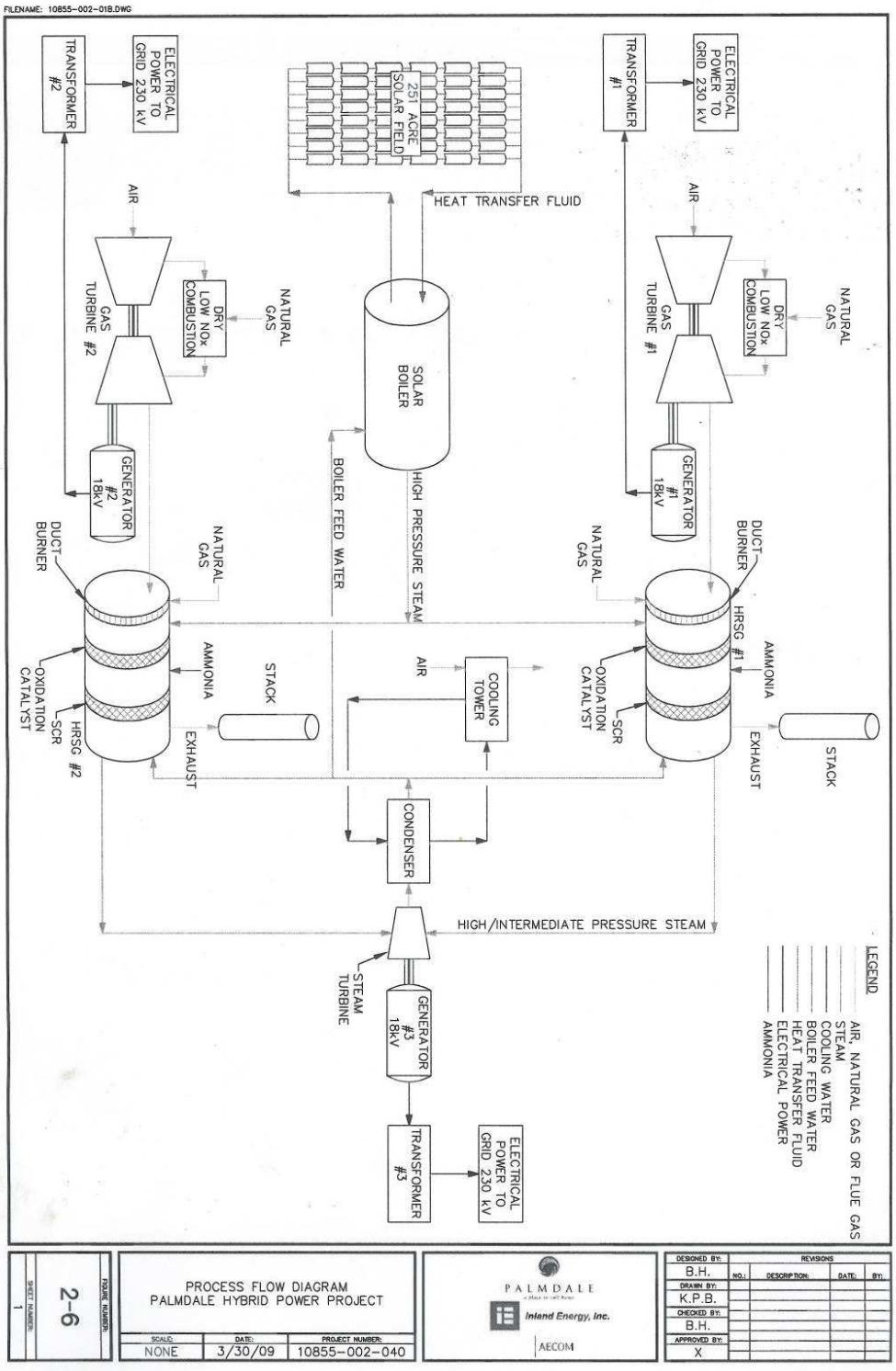
Emissions [pounds] = Emission factor [pounds/mile] x Vehicle miles traveled [miles]

The daily and annual VMT are estimated based on the following assumptions:

Mirror washing weekly six months per year and once per month for six months per year;
Application of soil stabilizers in the solar field quarterly;
Application of weed killer in the solar field quarterly; and
Inspection of the solar piping three times per day.
There is approximately 18 miles of piping in the solar field.

PHPP Solar Field Maintenance Vehicle Exhaust Emissions									
	Distance		Speed	CO	VOC	NOx	SOx	Exh. PM10	Exh. PM2.5
Vehicle	Miles/yr	Miles/day	Miles/hr	lb/hr					
Mirror Wash Truck	600	4.8	5	0.01	0.00	0.02	0.0002	0.001	0.001
Maintenance Vehicles	19200	76.8	10	0.01	0.00	0.00	0.0001	0.000	0.000
Weed Abatement	68	40	5	0.01	0.00	0.02	0.0002	0.001	0.001
Soil Stabilizer Application	68	40	5	0.01	0.00	0.02	0.0002	0.001	0.001
Total				0.04	0.01	0.06	0.0007	0.002	0.002
	Distance		Speed	CO	VOC	NOx	SOx	Exh. PM10	Exh. PM2.5
Vehicle	Miles/yr	Miles/day	Miles/hr	lb/day					
Mirror Wash Truck	600	4.8	5	0.01	0.00	0.02	0.0002	0.001	0.001
Maintenance Vehicles	19200	76.8	10	0.09	0.00	0.01	0.0008	0.001	0.001
Weed Abatement	68	40	5	0.09	0.02	0.17	0.0017	0.005	0.005
Soil Stabilizer Application	68	40	5	0.09	0.02	0.17	0.0017	0.005	0.005
Total				0.28	0.04	0.37	0.0044	0.011	0.011
	Distance		Speed	CO	VOC	NOx	SOx	Exh. PM10	Exh. PM2.5
Vehicle	Miles/yr	Miles/day	Miles/hr	tpy					
Mirror Wash Truck	600	4.8	5	0.00	0.00	0.00	0.0000	0.000	0.000
Maintenance Vehicles	19200	76.8	10	0.01	0.00	0.00	0.0001	0.000	0.000
Weed Abatement	68	40	5	0.00	0.00	0.00	0.0000	0.000	0.000
Soil Stabilizer Application	68	40	5	0.00	0.00	0.00	0.0000	0.000	0.000
Total				0.01	0.00	0.00	0.0001	0.000	0.000
2009 Motor Vehicle Emission Factors			Emission Factors						
Vehicle Use	Vehicle Type		Class	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)	(lb/mi)
Mirror Wash Truck	gallon		HHDT-DSL	0.00218	0.00044	0.00425	0.000042	0.00012	0.00012
Weed Abatement	gallon		HHDT-DSL	0.00218	0.00044	0.00425	0.000042	0.00012	0.00012
Soil Stabilizer Application	gallon		HHDT-DSL	0.00218	0.00044	0.00425	0.000042	0.00012	0.00012
Maintenance Vehicles	On-Site 3/4 Ton Pick-Up, Ford		LDT2-CAT	0.00120	0.00004	0.00009	0.000010	0.00001	0.00001

Note: The emission factors, except fugitive emissions from entrained road dust, were compiled by running the California Air Resources Board's EMFAC2007 (version 2.3) Burden Model and dividing calculated daily emissions by daily vehicle-miles-traveled. All vehicles were assumed to be 2011 model year.
All the emission factors account for the emissions from start, running and idling exhaust. In addition, the VOC emission factors take into account diurnal, hot soak, running and resting emissions.
Emissions [pounds] = Emission factor [pounds/mile] x Vehicle miles traveled [miles]


FILENAME: 10855-002-01B.DWG
TRANSFORMER #2
ELECTRICAL POWER TO GRID 230 kV
251 ACRE SOLAR FIELD
TRANSFORMER #1
ELECTRICAL POWER TO GRID 230 kV
HEAT TRANSFER FLUID
AIR
GAS TURBINE #2
DRY LOW NOx COMBUSTION
NATURAL GAS
SOLAR BOILER
GAS TURBINE #1
DRY LOW NOx COMBUSTION
NATURAL GAS
GENERATOR #2 18kV
BOILER FEED WATER
HIGH PRESSURE STEAM
GENERATOR #1 18kV
DUCT BURNER
NATURAL GAS
NATURAL GAS
DUCT BURNER
HRSG #2
OXIDATION CATALYST
SCR
AMMONIA
EXHAUST
STACK
AIR
COOLING TOWER
HRSG #1
OXIDATION CATALYST
SCR
AMMONIA
EXHAUST
STACK
CONDENSER
HIGH/INTERMEDIATE PRESSURE STEAM
STEAM TURBINE
GENERATOR #3 18kV
TRANSFORMER #3
ELECTRICAL POWER TO GRID 230 kV
LEGEND
AIR, NATURAL GAS OR FLUE GAS
STEAM
COOLING WATER
BOILER FEED WATER
HEAT TRANSFER FLUID
ELECTRICAL POWER
AMMONIA
FIGURE NUMBER: 2-6
SHEET NUMBER: 1
PROCESS FLOW DIAGRAM
PALMDALE HYBRID POWER PROJECT
SCALE: NONE
DATE: 3/30/09
PROJECT NUMBER: 10855-002-040
PALMDALE
Inland Energy, Inc.
AECOM
DESIGNED BY: B.H.
DRAWN BY: K.P.B.
CHECKED BY: B.H.
APPROVED BY: X
REVISIONS
NO.:
DESCRIPTION:
DATE:
BY:

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT
COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
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APPLICATION FOR CERTIFICATION
For the *PALMDALE HYBRID*
POWER PROJECT

Docket No. 08-AFC-9

PROOF OF SERVICE
(Revised 4/15/2010)

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DECLARATION OF SERVICE

I, Teraja` Golston, declare that on, May 17,2010, I served and filed copies of the attached (08-AFC-9) Palmdale – Antelope Valley AQMD Final Determination of Compliance (FDOC). The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: [http://www.energy.ca.gov/sitingcases/palmdale/index.html]. The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(*Check all that Apply*)

For service to all other parties:

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

_X_ by personal delivery;

_____ by delivering on this date, for mailing with the United States Postal Service with first-class postage thereon fully prepaid, to the name and address of the person served, for mailing that same day in the ordinary course of business; that the envelope was sealed and placed for collection and mailing on that date to those addresses NOT marked "email preferred."

AND

For filing with the Energy Commission:

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

OR

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

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 08-AFC-9
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct, that I am employed in the county where this mailing occurred, and that I am over the age of 18 years and not a party to the proceeding.

Original Signature in Dockets
Teraja` Golston