San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUG 25 2011

Mr. Michelle Helmer
California State Prison - Avenal
P O Box 8
Avenal, CA 93204

Re: Proposed ATC / Certificate of Conformity (Significant Mod)
District Facility # C-195
Project # C-1103854

Dear Mr. Helmer:

Enclosed for your review is the District's analysis of an application for Authorities to Construct for the facility identified above. The applicant is requesting that Certificates of Conformity with the procedural requirements of 40 CFR Part 70 be issued with this project. The proposal is to modify the turbine monitoring requirements in order to allow periodic monitoring of NOx emissions with a portable analyzer.

After addressing any EPA comments made during the 45-day comment period, the Authorities to Construct will be issued to the facility with Certificates of Conformity. Prior to operating with modifications authorized by the Authorities to Construct, the facility must submit an application to modify the Title V permit as an administrative amendment, in accordance with District Rule 2520, Section 11.5.

If you have any questions, please contact Mr. Jim Swaney, Permit Services Manager, at (559) 230-5900.

Thank you for your cooperation in this matter.

Sincerely,

David Warner
Director of Permit Services

Enclosures
c: Frank DeMaris, Permit Services

Seyed Sadredin
Executive Director/Air Pollution Control Officer

Northern Region
4800 Enterprise Way
Modesto, CA 95356-8718
Tel: (209) 557-6400 FAX: (209) 557-6475

Central Region (Main Office)
1990 E. Gettysburg Avenue
Fresno, CA 93726-0244
Tel: (559) 230-6000 FAX: (559) 230-6061

Southern Region
34946 Flyover Court
Bakersfield, CA 93308-9725
Tel: 661-392-5500 FAX: 661-392-5585

www.valleyair.org www.healthyairliving.com

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUG 25 2011

Gerardo C. Rios, Chief
Permits Office
Air Division
U.S. EPA - Region IX
75 Hawthorne St.
San Francisco, CA 94105

Re: Proposed ATC / Certificate of Conformity (Significant Mod)
District Facility # C-195
Project # C-1103854

Dear Mr. Rios:

Enclosed for your review is the District's engineering evaluation of an application for Authorities to Construct for California State Prison - Avenal at #1 Kings Way in Avenal, which has been issued a Title V permit. California State Prison - Avenal is requesting that Certificates of Conformity, with the procedural requirements of 40 CFR Part 70, be issued with this project. The proposal is to modify the turbine monitoring requirements in order to allow periodic monitoring of NOx emissions with a portable analyzer.

Enclosed is the engineering evaluation of this application with a copy of the current Title V permit and proposed Authorities to Construct # C-195-1-7 and '-3-7 with Certificates of Conformity. After demonstrating compliance with the Authority to Construct, the conditions will be incorporated into the facility's Title V permit through an administrative amendment.

Please submit your written comments on this project within the 45-day comment period that begins on the date you receive this letter. If you have any questions, please contact Mr. Jim Swaney, Permit Services Manager, at (559) 230-5900.

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Sincerely,

David Warner
Director of Permit Services

Enclosures
c: Frank DeMaris, Permit Services

San Joaquin Valley
AIR POLLUTION CONTROL DISTRICT

HEALTHY AIR LIVING™

AUG 25 2011

Mike Tollstrup, Chief
Project Assessment Branch
Air Resources Board
P O Box 2815
Sacramento, CA 95812-2815

Re: Proposed ATC / Certificate of Conformity (Significant Mod)
District Facility # C-195
Project # C-1103854

Dear Mr. Tollstrup:

Enclosed for your review is the District's analysis of an application for Authorities to Construct for the facility identified above. The applicant is requesting that Certificates of Conformity with the procedural requirements of 40 CFR Part 70 be issued with this project. The proposal is to modify the turbine monitoring requirements in order to allow periodic monitoring of NOx emissions with a portable analyzer.

Enclosed is the engineering evaluation of this application with a copy of the current Title V permit and proposed Authorities to Construct # C-195-1-7 and '-3-7 with Certificates of Conformity. After demonstrating compliance with the Authorities to Construct, the conditions will be incorporated into the facility's Title V permit through an administrative amendment.

Please submit your written comments on this project within the 30-day comment period that begins on the date you receive this letter. If you have any questions, please contact Mr. Jim Swaney, Permit Services Manager, at (559) 230-5900.

Thank you for your cooperation in this matter.

Sincerely,

David Warner
Director of Permit Services

Enclosures
c: Frank DeMaris, Permit Services

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Executive Director/Air Pollution Control Officer

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Hanford Sentinel

**NOTICE OF PRELIMINARY DECISION
FOR THE ISSUANCE OF AUTHORITY TO CONSTRUCT AND
THE PROPOSED SIGNIFICANT MODIFICATION OF FEDERALLY
MANDATED OPERATING PERMIT**

NOTICE IS HEREBY GIVEN that the San Joaquin Valley Air Pollution Control District solicits public comment on the proposed modification of California State Prison - Avenal for its prison at #1 Kings Way in Avenal, California. The proposal is to modify the turbine monitoring requirements in order to allow periodic monitoring of NOx emissions with a portable analyzer.

The District's analysis of the legal and factual basis for this proposed action, project #C-1103854, is available for public inspection at http://www.valleyair.org/notices/public_notices_idx.htm and the District office at the address below. This will be the public's only opportunity to comment on the specific conditions of the modification. If requested by the public, the District will hold a public hearing regarding issuance of this modification. For additional information, please contact Mr. Jim Swaney, Permit Services Manager, at (559) 230-5900. Written comments on the proposed initial permit must be submitted within 30 days of the publication date of this notice to DAVID WARNER, DIRECTOR OF PERMIT SERVICES, SAN JOAQUIN VALLEY AIR POLLUTION CONTROL DISTRICT, 1990 E. GETTYSBURG AVE, FRESNO, CA 93726-0244.

San Joaquin Valley Air Pollution Control District
Authority to Construct Application Review
Turbine Alternate Monitoring System Change

Facility Name:	California State Prison – Avenal	Date:	August 22, 2011
Mailing Address:	P O Box 8 Avenal, CA 93204	Engineer: Lead Engineer:	Frank DeMaris Sheraz Gill
Contact Person:	Michelle Helmar – Associate Warden		
Telephone:	(559) 386-0587 x5033		
Fax:	(559) 386-6054		
Application #s:	C-195-1-7, '-3-7		
Project #:	C-1103854		
Deemed Complete:	April 6, 2011		

I. Proposal

The California State Prison – Avenal ("Avenal Prison") currently operates a cogeneration system, consisting of two natural gas-fired turbines driving electrical generators and equipped with heat recovery systems for producing hot water. These cogeneration turbines operate under Permits to Operate (PTO) C-195-1-4 and '-3-4 and are used to provide electricity for the prison compound and hot water for building heat, inmate hygiene, and other uses. Avenal Prison is currently under a mutual settlement agreement to bring the turbines into compliance with the monitoring requirements of Rule 4703 (Stationary Gas Turbines), since the turbines have been operating for some time with water to fuel ratios outside the acceptable operating range. Avenal Prison is unable to manually adjust the water to fuel ratio because the turbine vendor never provided for manual adjustment and now refuses to provide service for the turbines after losing the operation and maintenance (O&M) contract.

Therefore, Avenal Prison has requested Authority to Construct (ATC) permits revising the turbine monitoring system required under Rule 4703 to allow for monthly monitoring of actual emissions using a portable analyzer. The District has reviewed Avenal Prison's proposed monitoring program and concluded it is at least as stringent as the monitoring program required under the provisions of Rule 4703. In accordance with FYI-111, *ATC, Title V, and NSR Applicability Determinations*, a change to the monitoring or record keeping requirements, provided the change does not lessen the stringency of an emission limit, is not a "modification" as defined in District Rule 2201 (New and Modified Stationary Source Review Rule). Therefore, this application will be processed as a non-NSR ATC application not subject to the requirements of Rule 2201

Avenal Prison received their Title V Permit on May 31, 2005. This modification can be classified as a Title V significant modification pursuant to Rule 2520, Section 3.20, and can be processed with a Certificate of Conformity (COC). Since the facility has specifically requested

that this project be processed in that manner, the 45-day EPA comment period will be satisfied prior to the issuance of the Authority to Construct. Avenal Prison will be required to submit a Title V administrative amendment application prior to operating under the revised provisions of the ATCs issued with this project.

II. Rules

Rule 2520 Federally Mandated Operating Permits (6/21/01)
Rule 4001 New Source Performance Standards (4/14/99)
Rule 4002 National Emission Standards for Hazardous Air Pollutant (5/20/04)
Rule 4101 Visible Emissions (2/17/05)
Rule 4102 Nuisance (12/17/92)
Rule 4201 Particulate Matter Concentration (12/17/92)
Rule 4202 Particulate Matter Emission Rate (12/17/92)
Rule 4301 Fuel Burning Equipment (12/17/92)
Rule 4703 Stationary Gas Turbines (9/20/07)
Rule 4801 Sulfur Compounds (12/17/92)
CH&SC 41700 Health Risk Assessment
CH&SC 42301.6 School Notification
Public Resources Code 21000-21177: California Environmental Quality Act (CEQA)
California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387: CEQA Guidelines

III. Location

Avenal Prison is located at #1 Kings Way in Avenal, California. The District has verified that this equipment is not located within 1,000 feet of the outer boundary of the nearest K-12 school. Therefore, the school notice requirements of California Health & Safety Code 42301.6 do not apply.

IV. Process Description

Avenal Prison is a correctional institution within the California Department of Corrections and Rehabilitation. These cogeneration turbines are used to drive electrical generators that provide electricity for on-site operations. In addition, each turbine is equipped with an unfired waste heat recovery boiler that uses the hot exhaust gas from the turbine to heat water. This hot water is then used for space heating, inmate hygiene, and various other uses.

V. Equipment Listing

Pre-Project Equipment Description:
C-195-1-4: 2,600 KW SOLAR CENTAUR MODEL GSC-4500 GAS TURBINE, AVENAL #1, SN DCG0211, WITH UNFIRED ENERGY RECOVERY INC. MODEL 52.5-1816 THERMAL RECOVERY, SN W2272

C-195-3-4: 2,600 KW SOLAR CENTAUR MODEL CSC-4500 GAS TURBINE, AVENAL #2, SN DCG02010, WITH ENERGY RECOVERY INC. MODEL 52.5-1416 THERMAL RECOVERY UNIT, SNW2274

ATC Equipment Description:

C-195-1-7: MODIFICATION OF 2,600 KW SOLAR CENTAUR MODEL GSC-4500 GAS TURBINE, AVENAL #1, SN DCG0211, WITH UNFIRED ENERGY RECOVERY INC. MODEL 52.5-1816 THERMAL RECOVERY, SN W2272: MODIFY MONITORING PROGRAM TO PERIODIC MONITORING OF NOX EMISSIONS

C-195-3-7: MODIFICATION OF 2,600 KW SOLAR CENTAUR MODEL CSC-4500 GAS TURBINE, AVENAL #2, SN DCG02010, WITH ENERGY RECOVERY INC. MODEL 52.5-1416 THERMAL RECOVERY UNIT, SN W2274: MODIFY MONITORING PROGRAM TO PERIODIC MONITORING OF NOX EMISSIONS

Post-Project Equipment Description:

C-195-1-7: 2,600 KW SOLAR CENTAUR MODEL GSC-4500 GAS TURBINE, AVENAL #1, SN DCG0211, WITH UNFIRED ENERGY RECOVERY INC. MODEL 52.5-1816 THERMAL RECOVERY, SN W2272

C-195-3-7: 2,600 KW SOLAR CENTAUR MODEL CSC-4500 GAS TURBINE, AVENAL #2, SN DCG02010, WITH ENERGY RECOVERY INC. MODEL 52.5-1416 THERMAL RECOVERY UNIT, SN W2274

VI. Emission Control Technology Evaluation

Natural gas is used as the primary fuel for these turbines, with fuel oil #2 permitted for use during natural gas curtailments. Emissions of all criteria pollutants are expected from the combustion of these fuels. Currently, the turbines are equipped with water injection systems, specified in the original permit application, that reduce combustion temperatures resulting in NOx emissions of less than 35 ppmvd @ 15% O_2. Emissions of SO_x and PM_{10} are minimized by the use of natural gas as the primary fuel, while emissions of CO and VOC can be minimized by the use of good combustion practices.

VII. General Calculations

Avenal Prison proposes to change the monitoring protocol for these turbines. As shown in Section I of this document, this action is not a modification under Rule 2201 (provided the stringency of the emission limits is not lessened) because a change in monitoring is not a change in the method of operation for the unit. Therefore, this change is not subject to new and modified stationary source review under Rule 2201, and no emission calculations are necessary. No further discussion is required.

VIII. Compliance

Rule 2520 Federally Mandated Operating Permits

This facility is subject to this Rule, and has received their Title V Operating Permit. Section 3.29 defines a significant permit modification as a "permit amendment that does not qualify as a minor permit modification or administrative amendment."

Section 3.20.2 states that minor permit modifications "Do not relax monitoring, reporting, or recordkeeping requirements in the permit and are not significant changes in existing monitoring permit terms or conditions". The monitoring method will be changing from continuous parametric monitoring to periodic emissions monitoring, which is a relaxation in monitoring conditions. Therefore, the proposed project constitutes a Significant Modification to the Title V Permit pursuant to Section 3.29.

As discussed above, the facility has applied for a Certificate of Conformity (COC); therefore, the facility must apply to modify their Title V permit with an administrative amendment prior to operating with the proposed modifications. Continued compliance with this rule is expected. The facility shall not implement the changes requested until the final ATC is issued.

Rule 4101 Visible Emissions
Rule 4102 Nuisance
Rule 4201 Particulate Matter Concentration
Rule 4202 Particulate Matter Emission Rate
Rule 4801 Sulfur Compounds

These turbines are subject to the requirements of these rules. Various conditions are included on the current PTOs to ensure compliance with these rules, and these conditions will be retained on the ATCs. No further discussion is required.

California Health & Safety Code 41700 (Health Risk Assessment)

District Policy APR-1905, *Risk Management Policy for Permitting New and Modified Sources*, specifies that for an increase in emissions associated with a proposed new source or modification, the District perform an analysis to determine the possible impact to the nearest resident or worksite. As demonstrated above, there are no increases in emissions associated with this project, therefore a health risk assessment is not necessary and no further risk analysis is required.

Rule 4001 New Source Performance Standards (NSPS)

This rule incorporates by reference the NSPS from Title 40, Code of Federal Regulations, Part 60 (40 CFR 60), and applies to all new sources of air pollution and modifications of existing sources of air pollution listed in any Subpart. Subparts GG and KKKK apply to stationary combustion turbines, but Subpart KKKK only applies to turbines that commence construction, reconstruction, or modification after February 18, 2005. These turbines were originally permitted in 1987 and have not been modified, as defined in 40 CFR 60.2, since the original installation. Therefore, Subpart KKKK does not apply to these units.

These turbines are subject to Subpart GG of the NSPS. The current PTOs include various conditions ensuring compliance with this Subpart, and most of these conditions will be retained on the ATC. However, Subpart GG requires continuous monitoring of the water to fuel ratio to demonstrate compliance with the NO_x emission limit, and Avenal Prison proposes to replace this monitoring requirement with the proposed alternative monitoring protocol. As discussed in the alternative monitoring protocol included in Appendix C, the District has the authority to approve alternative monitoring for compliance with Subpart GG. The conditions ensuring compliance with the monitoring requirements of Rule 4703 and Subpart GG will be discussed in the section of this document devoted to Rule 4703. No further discussion is required.

Rule 4002 National Emission Standards for Hazardous Air Pollutant (NESHAP)

This rule incorporates by reference the NESHAP from 40 CFR 61 and 63, and applies to all sources of hazardous air pollution listed in any Subpart. 40 CFR 63, Subpart YYYY applies to stationary gas turbines located at major sources of hazardous air pollutants (HAP). Avenal Prison is not a major source of HAP, so the turbines located at Avenal Prison are not subject to this Subpart. No other Subpart applies to these turbines, and no further discussion is required.

Rule 4301 Fuel Burning Equipment

These turbines combust natural gas, or fuel oil #2 during natural gas curtailments, and therefore meet the common English definition of "fuel burning equipment". However, "fuel burning equipment" is defined in the rule as involving the burning of fuel "for the primary purpose of producing heat or power by indirect heat transfer. These turbines produce electricity using mechanical energy, and are therefore not "fuel burning equipment" under the rule definition. This rule does not apply, and no further discussion is required.

Rule 4703 Stationary Gas Turbines

This rule is intended to limit emissions of NO_x and CO from stationary combustion turbines. These turbines are stationary turbines with ratings of 2.6 MW, which exceeds the 0.3 MW threshold of the rule, so these turbines are subject to this rule. Various conditions are included on the PTOs to ensure compliance with the requirements of this rule, and, except where required by the current proposal, these conditions will be retained on the ATCs.

Section 6.2 of the rule details the monitoring requirements that apply to various turbine categories. Section 6.2.2 provides that a turbine without an exhaust gas NO_x control device and without continuous emissions monitoring equipment shall be monitored for conformity with the operational characteristics recommended by the manufacturer or emission control system provider and approved by the District. These turbines are provided with water injection systems which are not considered exhaust gas NO_x control devices under the rule. Since the original ATC in 1986, Avenal Prison has always been required to continuously monitor the water to fuel injection rate and operate the turbines with water to fuel injection rates within parameters shown during source testing to ensure compliance with the NO_x emission limit. When this Rule was adopted in 1994, this parametric monitoring system was accepted as satisfying the monitoring requirement in the newly-adopted rule.

As noted in Section I of this document, Avenal Prison has no manual control of the water to fuel injection rate since the turbine manufacturer lost the O&M contract and refuses to provide any service outside such a contract. Avenal Prison has therefore been operating the turbines with a water to fuel ratio outside the parameters previously determined to ensure compliance with the NO_x emission limit. In order to comply with the monitoring requirements of the rule, Avenal Prison proposes to adopt an alternative monitoring system (AMS). The proposed AMS involves directly measuring the turbine NO_x and O_2 emission concentrations with a portable analyzer on a monthly basis in much the same way as boilers are allowed to conduct periodic emissions monitoring under the applicable policy.

Avenal Prison is expected to install SCR for each of the turbines and comply with the Tier 3 emission limit within the next year. Once SCR is installed Avenal Prison will be required to comply with the existing turbine monitoring protocol for system equipped with SCR, which involves monthly monitoring of emissions and continuous monitoring of the ammonia injection rate. Until then, Avenal Prison will be required to comply with the monitoring protocol specified in Appendix C. The following conditions will be included on the ATCs to ensure compliance:

- *The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable analyzer that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rule 4703 and 40 CFR 60.334]*

- *If the NOx and/or CO concentrations, as measured by the permittee with a portable analyzer, exceed the permitted emission limits, the permittee shall notify the District and return the NOx and CO concentrations to the permitted emission limits as soon as possible but no longer than 8 hours after detection. If the permittee's portable analyzer readings continue to exceed the permitted emissions limits after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days to demonstrate compliance with the permitted emissions limits. In lieu of conducting a source test, the permittee may stipulate that a violation has occurred, subject to enforcement action. The permittee must correct the violation, show compliance has been re-established, and resume monitoring procedures. If the*

deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rules 2201 and 4703]

- *All NOx, CO, and O2 emission readings shall be taken with the unit operating at conditions representative of normal operation or under the conditions specified in the Permit to Operate. The NOx, CO and O2 analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Analyzer readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4703]*

- *When this unit is modified to comply with the Tier 3 emission limits in Rule 4703, the monitoring program shall be revised as appropriate for the NOx controls applied to the Tier 3-compliant unit. [District Rule 4703]*

In addition, the current conditions requiring monitoring of the water-to-fuel injection ratio will be deleted, and the current source test condition modified to remove the requirement to establish the water-to-fuel injection ratio, as follows:

- *Permittee shall perform a source test to measure NOx and CO emissions (ppmvd @ 15% O2 and lb/hr) at least once every twelve months. [District Rules 1081 and 4703, 6.3.1]*

California Health & Safety Code 42301.6 (School Notice)

The District has verified that this site is not located within 1,000 feet of a school. Therefore, pursuant to California Health and Safety Code 42301.6, a school notice is not required.

California Environmental Quality Act (CEQA)

The California Environmental Quality Act (CEQA) requires each public agency to adopt objectives, criteria, and specific procedures consistent with CEQA Statutes and the CEQA Guidelines for administering its responsibilities under CEQA, including the orderly evaluation of projects and preparation of environmental documents. The San Joaquin Valley Unified Air Pollution Control District (District) adopted its *Environmental Review Guidelines* (ERG) in 2001. The basic purposes of CEQA are to:

- Inform governmental decision-makers and the public about the potential, significant environmental effects of proposed activities.
- Identify the ways that environmental damage can be avoided or significantly reduced.
- Prevent significant, avoidable damage to the environment by requiring changes in projects through the use of alternatives or mitigation measures when the governmental agency finds the changes to be feasible.

- Disclose to the public the reasons why a governmental agency approved the project in the manner the agency chose if significant environmental effects are involved.

The District performed an Engineering Evaluation (this document) for the proposed project and determined that all project specific emission units are exempt from Best Available Control Technology (BACT) requirements. Furthermore, the District conducted a Risk Management Review and concludes that potential health impacts are less than significant.
Issuance of permits for emissions units not subject to BACT requirements and with health impact less than significant is a matter of ensuring conformity with applicable District rules and regulations and does not require discretionary judgment or deliberation. Thus, the District concludes that this permitting action constitutes a ministerial approval. Section 21080 of the Public Resources Code exempts from the application of CEQA those projects over which a public agency exercises only ministerial approval. Therefore, the District finds that this project is exempt from the provisions of CEQA.

IX. Recommendation

Compliance with all applicable rules and regulations is expected. Pending a successful NSR Public Noticing period, issue Authorities to Construct C-195-1-7 and '-3-7 subject to the permit conditions on the attached draft Authority to Construct in Appendix A.

X. Billing Information

Billing Information		
Permit Number	**Fee Schedule**	**Description**
C-195-1-7	3020-08A-C	2,600 kW gas turbine Avenal #1
C-195-3-7	3020-08A-C	2,600 kW gas turbine Avenal #2

Appendices
Appendix A: Draft Authority to Construct
Appendix B: Current Permits to Operate
Appendix C: Alternative Monitoring Protocol

Appendix A
Draft Authority to Construct

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

PERMIT NO: C-195-1-7 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: CALIF STATE PRISON - AVENAL
MAILING ADDRESS: PO BOX 8
AVENAL, CA 93204

LOCATION: 1 KINGS WAY
AVENAL, CA 93204

EQUIPMENT DESCRIPTION:
MODIFICATION OF 2,600 KW SOLAR CENTAUR MODEL GSC-4500 GAS TURBINE, AVENAL #1, SN DCG0211, WITH UNFIRED ENERGY RECOVERY INC. MODEL 52.5-1816 THERMAL RECOVERY, SN W2272: MODIFY MONITORING PROGRAM TO PERIODIC MONITORING OF NOX EMISSIONS

CONDITIONS

1. This turbine shall not operate for more than 8,050 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
2. This turbine shall not operate when the 21 MMBtu/hr backup boiler (C-195-2) and the other turbine (C-195-3) are both operating except for cold starts of less than 1 hour, a shutdown of less than 2 hours, and boiler testing totaling less than 24 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
3. This turbine shall only be fired on PUC-regulated natural gas or on No. 2 fuel oil with a maximum sulfur content of 0.12% by weight as a backup fuel. [40 CFR 60.333, District NSR Rule, District Rule 4201, and District Rule 4801] Federally Enforceable Through Title V Permit
4. Natural gas fuel consumption for the turbine shall not exceed 879,960 scf per day. [District NSR Rule] Federally Enforceable Through Title V Permit
5. No. 2 fuel oil with a maximum sulfur content of 0.12% by weight may be used for up to 100 hours per year if the natural gas supply is interrupted. No. 2 fuel oil consumption shall not exceed 8,540 gallons per day. [District NSR Rule, District Rule 4801, and 40 CFR 60.333(b)] Federally Enforceable Through Title V Permit
6. The combined total operating hours of two turbines (C-195-1 and C-195-3) when operating concurrently with two 25.1 MMBtu/hr boilers (C-195-12 and C-195-13) shall not exceed 5,203 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DAVID WARNER, Director of Permit Services
C-195-1-7 · Aug 18 2011 4:30PM – DEMARISF : Joint Inspection NOT Required

7. Daily hours of concurrent operation with the two 25.1 boilers (C-195-12 and C-195-13) shall be maintained. [District Rules 1070 and 2520, 9.3.2] Federally Enforceable Through Title V Permit
8. When firing on natural gas, the exhaust NOx concentrations shall not exceed 35.0 ppmvd @15% O2 (averaged over a 3-hour period) or 4.27 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit
9. When firing on No. 2 fuel oil, the exhaust NOx concentration shall not exceed 54.6 ppmvd @15% O2 (averaged over a 3-hour period) or 8.81 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit
10. When firing on natural gas, the exhaust CO concentration shall not exceed 130.0 ppmvd @ 15% O2 or 10.00 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit
11. When firing on No. 2 fuel oil, the exhaust CO concentration shall not exceed 172.3 ppmvd @ 15% O2 or 16.92 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit
12. Daily emissions shall not exceed any of the following: 122.6 lb-SOx/day, 36.0 lb-PM10/day, or 120.0 lb-VOC(NMHC)/day. [District NSR Rule and District Rule 4301] Federally Enforceable Through Title V Permit
13. Permittee shall perform a source test to measure NOx and CO emissions (ppmvd @ 15% O2 and lb/hr) at least once every twelve months. [District Rules 1081 and 4703, 6.3.1] Federally Enforceable Through Title V Permit
14. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit
15. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit
16. The following test methods shall be used: NOx: EPA Methods 7E or 20 or CARB Method 100; CO: EPA Methods 10 or 10B or CARB Method 100; and Oxygen content of the exhaust gas: EPA Methods 3, 3A, or 20. [40 CFR 60.8(a) and District Rule 4703, 6.3.1, 6.4.1, 6.4.2, and 6.4.3] Federally Enforceable Through Title V Permit
17. The following test method shall be used for fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rule 4102 and 40 CFR 60.335(b)(10)(ii)] Federally Enforceable Through Title V Permit
18. The following test methods shall be used to determine the sulfur content of the liquid fuel: ASTM D129, D2622, D4294, D1266, D5453 or D1552. [District Rule 4801 and 40 CFR 60.335(b)(10)(i)] Federally Enforceable Through Title V Permit
19. The HHV and LHV of the fuel combusted shall be determined using ASTM D3588, ASTM 1826, or ASTM 1945. [District Rule 4703, 6.4.5] Federally Enforceable Through Title V Permit
20. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable analyzer that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rule 4703 and 40 CFR 60.334]

CONDITIONS CONTINUE ON NEXT PAGE

21. If the NOx and/or CO concentrations, as measured by the permittee with a portable analyzer, exceed the permitted emission limits, the permittee shall notify the District and return the NOx and CO concentrations to the permitted emission limits as soon as possible but no longer than 8 hours after detection. If the permittee's portable analyzer readings continue to exceed the permitted emissions limits after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days to demonstrate compliance with the permitted emissions limits. In lieu of conducting a source test, the permittee may stipulate that a violation has occurred, subject to enforcement action. The permittee must correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rules 2201 and 4703]

22. All NOx, CO, and O2 emission readings shall be taken with the unit operating at conditions representative of normal operation or under the conditions specified in the Permit to Operate. The NOx, CO and O2 analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Analyzer readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4703]

23. When this unit is modified to comply with the Tier 3 emission limits in Rule 4703, the monitoring program shall be revised as appropriate for the NOx controls applied to the Tier 3-compliant unit. [District Rule 4703]

24. Permittee shall record fuel consumption, fuel type, and sulfur content of fuel. Records shall be retained for at least five years and shall be made available for District inspection upon request. [District Rules 1070 and 2520, 9.4.2] Federally Enforceable Through Title V Permit

25. The owner or operator shall maintain the gas quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the gaseous fuel, specifying that the maximum total sulfur content of the fuel is 10 grains/100 scf or less. [District Rule 2520, 9.3.2, District Rule 4301, and 40 CFR 60.334(h)(3)] Federally Enforceable Through Title V Permit

26. Reduced Load Period shall be defined as the time during which a gas turbine is operated at less than rated capacity in order to change the position of the exhaust gas diverter gate, not to exceed one hour. [District Rule 4703, 3.19] Federally Enforceable Through Title V Permit

27. Thermal Stabilization Period shall be defined as the start up or shut down time during which the exhaust gas is not within the normal operating temperature range, not to exceed two hours. [District Rule 4703, 3.25] Federally Enforceable Through Title V Permit

28. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

29. Particulate matter emissions shall not exceed 0.1 grains/scf at 12% CO2. [District Rule 4301] Federally Enforceable Through Title V Permit

30. The owner or operator shall maintain a stationary gas turbine operating log that includes, on a daily basis, the actual local start-up and stop time, length and reason for reduced load periods or thermal stabilizing periods, total hours of operation, and the type and quantity of fuel consumed. [District Rule 4703, 6.2.6] Federally Enforceable Through Title V Permit

31. The owner or operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rules 2520, 9.4.2 and 4703, 6.2.4] Federally Enforceable Through Title V Permit

San Joaquin Valley
Air Pollution Control District

AUTHORITY TO CONSTRUCT

DRAFT

PERMIT NO: C-195-3-7 **ISSUANCE DATE:** DRAFT

LEGAL OWNER OR OPERATOR: CALIF STATE PRISON - AVENAL
MAILING ADDRESS: PO BOX 8
AVENAL, CA 93204

LOCATION: 1 KINGS WAY
AVENAL, CA 93204

EQUIPMENT DESCRIPTION:
MODIFICATION OF 2,600 KW SOLAR CENTAUR MODEL CSC-4500 GAS TURBINE, AVENAL #2, SN DCG02010, WITH ENERGY RECOVERY INC. MODEL 52.5-1416 THERMAL RECOVERY UNIT, SN W2274: MODIFY MONITORING PROGRAM TO PERIODIC MONITORING OF NOX EMISSIONS

CONDITIONS

1. This turbine shall not operate for more than 8,050 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
2. This turbine shall not operate when the 21 MMBtu/hr backup boiler (C-195-2) and the other turbine (C-195-1) are both operating except for cold starts of less than 1 hour, a shutdown of less than 2 hours, and boiler testing totaling less than 24 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
3. This turbine shall only be fired on PUC-regulated natural gas or on No. 2 fuel oil with a maximum sulfur content of 0.12% by weight as a backup fuel. [40 CFR 60.333, District NSR Rule, District Rule 4201, and District Rule 4801] Federally Enforceable Through Title V Permit
4. Natural gas fuel consumption for the turbine shall not exceed 879,960 scf per day. [District NSR Rule] Federally Enforceable Through Title V Permit
5. No. 2 fuel oil with a maximum sulfur content of 0.12% by weight may be used for up to 100 hours per year if the natural gas supply is interrupted. No. 2 fuel oil consumption shall not exceed 8,540 gallons per day. [District NSR Rule, District Rule 4801, and 40 CFR 60.333(b)] Federally Enforceable Through Title V Permit
6. The combined total operating hours of two turbines (C-195-1 and C-195-3) when operating concurrently with two 25.1 MMBtu/hr boilers (C-195-12 and C-195-13) shall not exceed 5,203 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit

CONDITIONS CONTINUE ON NEXT PAGE

YOU MUST NOTIFY THE DISTRICT COMPLIANCE DIVISION AT (559) 230-5950 WHEN CONSTRUCTION IS COMPLETED AND PRIOR TO OPERATING THE EQUIPMENT OR MODIFICATIONS AUTHORIZED BY THIS AUTHORITY TO CONSTRUCT. This is NOT a PERMIT TO OPERATE. Approval or denial of a PERMIT TO OPERATE will be made after an inspection to verify that the equipment has been constructed in accordance with the approved plans, specifications and conditions of this Authority to Construct, and to determine if the equipment can be operated in compliance with all Rules and Regulations of the San Joaquin Valley Unified Air Pollution Control District. Unless construction has commenced pursuant to Rule 2050, this Authority to Construct shall expire and application shall be cancelled two years from the date of issuance. The applicant is responsible for complying with all laws, ordinances and regulations of all other governmental agencies which may pertain to the above equipment.

Seyed Sadredin, Executive Director / APCO

DRAFT

DAVID WARNER, Director of Permit Services
C-195-3-7 : Aug 18 2011 4:30PM – DEMARISF . Joint Inspection NOT Required

7. Daily hours of concurrent operation with the two 25.1 boilers (C-195-12 and C-195-13) shall be maintained. [District Rules 1070 and 2520, 9.3.2] Federally Enforceable Through Title V Permit

8. When firing on natural gas, the exhaust NOx concentrations shall not exceed 35.0 ppmvd @15% O2 (averaged over a 3-hour period) or 4.27 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit

9. When firing on No. 2 fuel oil, the exhaust NOx concentration shall not exceed 54.6 ppmvd @15% O2 (averaged over a 3-hour period) or 8.81 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit

10. When firing on natural gas, the exhaust CO concentration shall not exceed 130.0 ppmvd @ 15% O2 or 10.00 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit

11. When firing on No. 2 fuel oil, the exhaust CO concentration shall not exceed 172.3 ppmvd @ 15% O2 or 16.92 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit

12. Daily emissions shall not exceed any of the following: 122.6 lb-SOx/day, 36.0 lb-PM10/day, or 120.0 lb-VOC(NMHC)/day. [District NSR Rule and District Rule 4301] Federally Enforceable Through Title V Permit

13. Permittee shall perform a source test to measure NOx and CO emissions (ppmvd @ 15% O2 and lb/hr) at least once every twelve months. [District Rules 1081 and 4703, 6.3.1] Federally Enforceable Through Title V Permit

14. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

15. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

16. The following test methods shall be used: NOx: EPA Methods 7E or 20 or CARB Method 100; CO: EPA Methods 10 or 10B or CARB Method 100; and Oxygen content of the exhaust gas: EPA Methods 3, 3A, or 20. [40 CFR 60.8(a) and District Rule 4703, 6.3.1, 6.4.1, 6.4.2, and 6.4.3] Federally Enforceable Through Title V Permit

17. The following test method shall be used for fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rule 4102 and 40 CFR 60.335(b)(10)(ii)] Federally Enforceable Through Title V Permit

18. The following test methods shall be used to determine the sulfur content of the liquid fuel: ASTM D129, D2622, D4294, D1266, D5453 or D1552. [District Rule 4801 and 40 CFR 60.335(b)(10)(i)] Federally Enforceable Through Title V Permit

19. The HHV and LHV of the fuel combusted shall be determined using ASTM D3588, ASTM 1826, or ASTM 1945. [District Rule 4703, 6.4.5] Federally Enforceable Through Title V Permit

20. The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable analyzer that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rule 4703 and 40 CFR 60.334]

CONDITIONS CONTINUE ON NEXT PAGE

21. If the NOx and/or CO concentrations, as measured by the permittee with a portable analyzer, exceed the permitted emission limits, the permittee shall notify the District and return the NOx and CO concentrations to the permitted emission limits as soon as possible but no longer than 8 hours after detection. If the permittee's portable analyzer readings continue to exceed the permitted emissions limits after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days to demonstrate compliance with the permitted emissions limits. In lieu of conducting a source test, the permittee may stipulate that a violation has occurred, subject to enforcement action. The permittee must correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rules 2201 and 4703]

22. All NOx, CO, and O2 emission readings shall be taken with the unit operating at conditions representative of normal operation or under the conditions specified in the Permit to Operate. The NOx, CO and O2 analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Analyzer readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4703]

23. When this unit is modified to comply with the Tier 3 emission limits in Rule 4703, the monitoring program shall be revised as appropriate for the NOx controls applied to the Tier 3-compliant unit. [District Rule 4703]

24. Permittee shall record fuel consumption, fuel type, and sulfur content of fuel. Records shall be retained for at least five years and shall be made available for District inspection upon request. [District Rules 1070 and 2520, 9.4.2] Federally Enforceable Through Title V Permit

25. The owner or operator shall maintain the gas quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the gaseous fuel, specifying that the maximum total sulfur content of the fuel is 10 grains/100 scf or less. [District Rule 2520, 9.3.2, District Rule 4301, and 40 CFR 60.334(h)(3)] Federally Enforceable Through Title V Permit

26. Reduced Load Period shall be defined as the time during which a gas turbine is operated at less than rated capacity in order to change the position of the exhaust gas diverter gate, not to exceed one hour. [District Rule 4703, 3.19] Federally Enforceable Through Title V Permit

27. Thermal Stabilization Period shall be defined as the start up or shut down time during which the exhaust gas is not within the normal operating temperature range, not to exceed two hours. [District Rule 4703, 3.25] Federally Enforceable Through Title V Permit

28. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

29. Particulate matter emissions shall not exceed 0.1 grains/scf at 12% CO2. [District Rule 4301] Federally Enforceable Through Title V Permit

30. The owner or operator shall maintain a stationary gas turbine operating log that includes, on a daily basis, the actual local start-up and stop time, length and reason for reduced load periods or thermal stabilizing periods, total hours of operation, and the type and quantity of fuel consumed. [District Rule 4703, 6.2.6] Federally Enforceable Through Title V Permit

31. The owner or operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rules 2520, 9.4.2 and 4703, 6.2.4] Federally Enforceable Through Title V Permit

Appendix B
Current Permits to Operate

EXPIRATION DATE: 10/31/2009

LEGAL OWNER OR OPERATOR: CALIF STATE PRISON - AVENAL
MAILING ADDRESS: PO BOX 8
AVENAL, CA 93204

LOCATION: 1 KINGS WAY
AVENAL, CA 93204

INSPECT PROGRAM PARTICIPANT: NO

EQUIPMENT DESCRIPTION:
2,600 KW SOLAR CENTAUR MODEL GSC-4500 GAS TURBINE, AVENAL #1, SN DCG0211, WITH UNFIRED ENERGY RECOVERY INC. MODEL 52.5-1816 THERMAL RECOVERY, SN W2272

CONDITIONS

1. This turbine shall not operate for more than 8,050 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
2. This turbine shall not operate when the 21 MMBtu/hr backup boiler (C-195-2) and the other turbine (C-195-3) are both operating except for cold starts of less than 1 hour, a shutdown of less than 2 hours, and boiler testing totaling less than 24 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
3. This turbine shall only be fired on PUC-regulated natural gas or on No. 2 fuel oil with a maximum sulfur content of 0.12% by weight as a backup fuel. [40 CFR 60.333, District NSR Rule, District Rule 4201, and District Rule 4801] Federally Enforceable Through Title V Permit
4. Natural gas fuel consumption for the turbine shall not exceed 879,960 scf per day. [District NSR Rule] Federally Enforceable Through Title V Permit
5. No. 2 fuel oil with a maximum sulfur content of 0.12% by weight may be used for up to 100 hours per year if the natural gas supply is interrupted. No. 2 fuel oil consumption shall not exceed 8,540 gallons per day. [District NSR Rule, District Rule 4801, and 40 CFR 60.333(b)] Federally Enforceable Through Title V Permit
6. The combined total operating hours of two turbines (C-195-1 and C-195-3) when operating concurrently with two 25.1 MMBtu/hr boilers (C-195-12 and C-195-13) shall not exceed 5,203 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
7. Daily hours of concurrent operation with the two 25.1 boilers (C-195-12 and C-195-13) shall be maintained. [District Rules 1070 and 2520, 9.3.2] Federally Enforceable Through Title V Permit
8. When firing on natural gas, the exhaust NOx concentrations shall not exceed 35.0 ppmvd @15% O2 (averaged over a 3-hour period) or 4.27 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit
9. When firing on No. 2 fuel oil, the exhaust NOx concentration shall not exceed 54.6 ppmvd @15% O2 (averaged over a 3-hour period) or 8.81 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit
10. When firing on natural gas, the exhaust CO concentration shall not exceed 130.0 ppmvd @ 15% O2 or 10.00 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit
11. When firing on No. 2 fuel oil, the exhaust CO concentration shall not exceed 172.3 ppmvd @ 15% O2 or 16.92 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit
12. Daily emissions shall not exceed any of the following: 122.6 lb-SOx/day, 36.0 lb-PM10/day, or 120.0 lb-VOC(NMHC)/day. [District NSR Rule and District Rule 4301] Federally Enforceable Through Title V Permit
13. Permittee shall operate a continuous monitoring system to monitor and record fuel consumption, hours of operation, and ratio of water injected to fuel fired in the turbine. [District NSR Rule, District Rule 4703, 6.2, and 40 CFR 60.334(a)] Federally Enforceable Through Title V Permit

14. The steam or water to fuel ratio or other parameters that are continuously monitored shall be monitored during the performance test required under §60.8, to establish acceptable values and ranges. The owner or operator may supplement the performance test data with engineering analyses, design specifications, manufacturer's recommendations and other relevant information to define the acceptable parametric ranges more precisely. [40 CFR 60.334(g)] Federally Enforceable Through Title V Permit

15. The owner or operator shall develop and keep on-site a parameter monitoring plan which explains the procedures used to document proper operation of the NOx emission controls. The plan shall include the parameter(s) monitored and the acceptable range(s) of the parameter(s) as well as the basis for designating the parameter(s) and acceptable range(s). Any supplemental data such as engineering analyses, design specifications, manufacturer's recommendations and other relevant information shall be included in the monitoring plan. [District Rule 2520, 9.3.2 and 40 CFR 60.334(g)] Federally Enforceable Through Title V Permit

16. Permittee shall perform a source test to measure NOx and CO emissions (ppmvd @ 15% O2 and lb/hr) and to correlate the amount of water injected to the amount of fuel consumed to the associated measured NOx emissions levels at least once every twelve months. [District Rules 1081 and 4706, 6.3.1] Federally Enforceable Through Title V Permit

17. The water-to-fuel ratio shall be maintained between the limits established by source testing. [District NSR Rule and District Rule 4703, 6.2.5] Federally Enforceable Through Title V Permit

18. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

19. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

20. The following test methods shall be used: NOx: EPA Methods 7E or 20 or CARB Method 100; CO: EPA Methods 10 or 10B or CARB Method 100; and Oxygen content of the exhaust gas: EPA Methods 3, 3A, or 20. [40 CFR 60.8(a) and District Rule 4703, 6.3.1, 6.4.1, 6.4.2, and 6.4.3] Federally Enforceable Through Title V Permit

21. The following test method shall be used for fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rule 4102 and 40 CFR 60.335(b)(10)(ii)] Federally Enforceable Through Title V Permit

22. The following test methods shall be used to determine the sulfur content of the liquid fuel: ASTM D129, D2622, D4294, D1266, D5453 or D1552. [District Rule 4801 and 40 CFR 60.335(b)(10)(i)] Federally Enforceable Through Title V Permit

23. The HHV and LHV of the fuel combusted shall be determined using ASTM D3588, ASTM 1826, or ASTM 1945. [District Rule 4703, 6.4.5] Federally Enforceable Through Title V Permit

24. Permittee shall record fuel consumption, fuel type, and sulfur content of fuel. Records shall be retained for at least five years and shall be made available for District inspection upon request. [District Rules 1070 and 2520, 9.4.2] Federally Enforceable Through Title V Permit

25. The owner or operator shall maintain the gas quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the gaseous fuel, specifying that the maximum total sulfur content of the fuel is 10 grains/100 scf or less. [District Rule 2520, 9.3.2, District Rule 4301, and 40 CFR 60.334(h)(3)] Federally Enforceable Through Title V Permit

26. Reduced Load Period shall be defined as the time during which a gas turbine is operated at less than rated capacity in order to change the position of the exhaust gas diverter gate, not to exceed one hour. [District Rule 4703, 3.19] Federally Enforceable Through Title V Permit

27. Thermal Stabilization Period shall be defined as the start up or shut down time during which the exhaust gas is not within the normal operating temperature range, not to exceed two hours. [District Rule 4703, 3.25] Federally Enforceable Through Title V Permit

28. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

29. Particulate matter emissions shall not exceed 0.1 grains/scf at 12% CO2. [District Rule 4301] Federally Enforceable Through Title V Permit

30. The owner or operator shall maintain a stationary gas turbine operating log that includes, on a daily basis, the actual local start-up and stop time, length and reason for reduced load periods or thermal stabilizing periods, total hours of operation, and the type and quantity of fuel consumed. [District Rule 4703, 6.2.6] Federally Enforceable Through Title V Permit

31. The owner or operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rules 2520, 9.4.2 and 4703, 6.2.4] Federally Enforceable Through Title V Permit

EXPIRATION DATE: 10/31/2009

LEGAL OWNER OR OPERATOR: CALIF STATE PRISON - AVENAL
MAILING ADDRESS: PO BOX 8
AVENAL, CA 93204

LOCATION: 1 KINGS WAY
AVENAL, CA 93204

INSPECT PROGRAM PARTICIPANT: NO

EQUIPMENT DESCRIPTION:
2,600 KW SOLAR CENTAUR MODEL CSC-4500 GAS TURBINE, AVENAL #2, SN CG86N27, WITH ENERGY RECOVERY INC. MODEL 52.5-1416 THERMAL RECOVERY UNIT, SNW2274

CONDITIONS

1. This turbine shall not operate for more than 8,050 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
2. This turbine shall not operate when the 21 MMBtu/hr backup boiler (C-195-2) and the other turbine (C-195-1) are both operating except for cold starts of less than 1 hour, a shutdown of less than 2 hours, and boiler testing totaling less than 24 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
3. This turbine shall only be fired on PUC-regulated natural gas or on No. 2 fuel oil with a maximum sulfur content of 0.12% by weight as a backup fuel. [40 CFR 60.333, District NSR Rule, District Rule 4201, and District Rule 4801] Federally Enforceable Through Title V Permit
4. Natural gas fuel consumption for the turbine shall not exceed 879,960 scf per day. [District NSR Rule] Federally Enforceable Through Title V Permit
5. No. 2 fuel oil with a maximum sulfur content of 0.12% by weight may be used for up to 100 hours per year if the natural gas supply is interrupted. No. 2 fuel oil consumption shall not exceed 8,540 gallons per day. [District NSR Rule, District Rule 4801, and 40 CFR 60.333(b)] Federally Enforceable Through Title V Permit
6. The combined total operating hours of two turbines (C-195-1 and C-195-3) when operating concurrently with two 25.1 MMBtu/hr boilers (C-195-12 and C-195-13) shall not exceed 5,203 hours per year. [District NSR Rule] Federally Enforceable Through Title V Permit
7. Daily hours of concurrent operation with the two 25.1 boilers (C-195-12 and C-195-13) shall be maintained. [District Rules 1070 and 2520, 9.3.2] Federally Enforceable Through Title V Permit
8. When firing on natural gas, the exhaust NOx concentrations shall not exceed 35.0 ppmvd @15% O2 (averaged over a 3-hour period) or 4.27 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit
9. When firing on No. 2 fuel oil, the exhaust NOx concentration shall not exceed 54.6 ppmvd @15% O2 (averaged over a 3-hour period) or 8.81 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule, District Rule 4703, 5.1.2, and 40 CFR 60.332(a)(2)] Federally Enforceable Through Title V Permit
10. When firing on natural gas, the exhaust CO concentration shall not exceed 130.0 ppmvd @ 15% O2 or 10.00 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit
11. When firing on No. 2 fuel oil, the exhaust CO concentration shall not exceed 172.3 ppmvd @ 15% O2 or 16.92 lb/hr except during the thermal stabilizing period or reduced load period. [District NSR Rule and District Rule 4703, 5.2] Federally Enforceable Through Title V Permit
12. Daily emissions shall not exceed any of the following: 122.6 lb-SOx/day, 36.0 lb-PM10/day, or 120.0 lb-VOC(NMHC)/day. [District NSR Rule and District Rule 4301] Federally Enforceable Through Title V Permit
13. Permittee shall operate a continuous monitoring system to monitor and record fuel consumption, hours of operation, and ratio of water injected to fuel fired in the turbine. [District NSR Rule, District Rule 4703, 6.2, and 40 CFR 60.334(a)] Federally Enforceable Through Title V Permit

14. The steam or water to fuel ratio or other parameters that are continuously monitored shall be monitored during the performance test required under §60.8, to establish acceptable values and ranges. The owner or operator may supplement the performance test data with engineering analyses, design specifications, manufacturer's recommendations and other relevant information to define the acceptable parametric ranges more precisely. [40 CFR 60.334(g)] Federally Enforceable Through Title V Permit

15. The owner or operator shall develop and keep on-site a parameter monitoring plan which explains the procedures used to document proper operation of the NOx emission controls. The plan shall include the parameter(s) monitored and the acceptable range(s) of the parameter(s) as well as the basis for designating the parameter(s) and acceptable range(s). Any supplemental data such as engineering analyses, design specifications, manufacturer's recommendations and other relevant information shall be included in the monitoring plan. [District Rule 2520, 9.3.2 and 40 CFR 60.334(g)] Federally Enforceable Through Title V Permit

16. Permittee shall perform a source test to measure NOx and CO emissions (ppmvd @ 15% O2 and lb/hr) and to correlate the amount of water injected to the amount of fuel consumed to the associated measured NOx emissions levels at least once every twelve months. [District Rules 1081 and 4706, 6.3.1] Federally Enforceable Through Title V Permit

17. The water-to-fuel ratio shall be maintained between the limits established by source testing. [District NSR Rule and District Rule 4703, 6.2.5] Federally Enforceable Through Title V Permit

18. Source testing shall be conducted using the methods and procedures approved by the District. The District must be notified at least 30 days prior to any compliance source test, and a source test plan must be submitted for approval at least 15 days prior to testing. [District Rule 1081] Federally Enforceable Through Title V Permit

19. The results of each source test shall be submitted to the District within 60 days thereafter. [District Rule 1081] Federally Enforceable Through Title V Permit

20. The following test methods shall be used: NOx: EPA Methods 7E or 20 or CARB Method 100; CO: EPA Methods 10 or 10B or CARB Method 100; and Oxygen content of the exhaust gas: EPA Methods 3, 3A, or 20. [40 CFR 60.8(a) and District Rule 4703, 6.3.1, 6.4.1, 6.4.2, and 6.4.3] Federally Enforceable Through Title V Permit

21. The following test method shall be used for fuel gas sulfur content: ASTM D3246. EPA approved alternative test methods as approved by the District may also be used to address the source testing requirements of this permit. [District Rule 4102 and 40 CFR 60.335(b)(10)(ii)] Federally Enforceable Through Title V Permit

22. The following test methods shall be used to determine the sulfur content of the liquid fuel: ASTM D129, D2622, D4294, D1266, D5453 or D1552. [District Rule 4801 and 40 CFR 60.335(b)(10)(i)] Federally Enforceable Through Title V Permit

23. The HHV and LHV of the fuel combusted shall be determined using ASTM D3588, ASTM 1826, or ASTM 1945. [District Rule 4703, 6.4.5] Federally Enforceable Through Title V Permit

24. Permittee shall record fuel consumption, fuel type, and sulfur content of fuel. Records shall be retained for at least five years and shall be made available for District inspection upon request. [District Rules 1070 and 2520, 9.4.2] Federally Enforceable Through Title V Permit

25. The owner or operator shall maintain the gas quality characteristics in a current, valid purchase contract, tariff sheet, or transportation contract for the gaseous fuel, specifying that the maximum total sulfur content of the fuel is 10 grains/100 scf or less. [District Rule 2520, 9.3.2, District Rule 4301, and 40 CFR 60.334(h)(3)] Federally Enforceable Through Title V Permit

26. Reduced Load Period shall be defined as the time during which a gas turbine is operated at less than rated capacity in order to change the position of the exhaust gas diverter gate, not to exceed one hour. [District Rule 4703, 3.19] Federally Enforceable Through Title V Permit

27. Thermal Stabilization Period shall be defined as the start up or shut down time during which the exhaust gas is not within the normal operating temperature range, not to exceed two hours. [District Rule 4703, 3.25] Federally Enforceable Through Title V Permit

28. Particulate matter emissions shall not exceed 0.1 grains/dscf in concentration. [District Rule 4201] Federally Enforceable Through Title V Permit

29. Particulate matter emissions shall not exceed 0.1 grains/scf at 12% CO2. [District Rule 4301] Federally Enforceable Through Title V Permit

30. The owner or operator shall maintain a stationary gas turbine operating log that includes, on a daily basis, the actual local start-up and stop time, length and reason for reduced load periods or thermal stabilizing periods, total hours of operation, and the type and quantity of fuel consumed. [District Rule 4703, 6.2.6] Federally Enforceable Through Title V Permit

31. The owner or operator shall maintain all records of required monitoring data and support information for inspection at any time for a period of five years. [District Rules 2520, 9.4.2 and 4703, 6.2.4] Federally Enforceable Through Title V Permit

Appendix C
Alternative Monitoring Protocol

San Joaquin Valley Unified Air Pollution Control District

Alternate Monitoring Proposal for Rule 4703
Monitoring of NOx Emissions Using a Portable Analyzer

Approved By: _____ Date: _____
David Warner
Director of Permit Services

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Date:	May 5, 2011
Application Numbers:	C-195-1-7 and C-195-3-7
Project Number:	C-1103854

Proposal

The California State Prison – Avenal ("Avenal Prison") currently operates a cogeneration system which includes two 2.6 MW natural gas-fired Solar Centaur turbines driving electrical generators and equipped with heat recovery systems for producing hot water. These cogeneration turbines, which are used to provide electricity for the prison compound and hot water for building heat, inmate hygiene, and other uses, operate under Permits to Operate (PTO) C-195-1-4 and '-3-4. In April 2011, Avenal Prison entered into a mutual settlement agreement to resolve a 2008 Notice of Violation (NOV) for failing to monitor operation of the turbines properly. Under the New Source Performance Standard (NSPS) for stationary gas turbines, Avenal Prison is required to continuously monitor the water to fuel ratio (WFR) as a mechanism for demonstrating continuous compliance with the NO_x emission limit. During the original source test in 1990, Avenal Prison was supposed to have the WFR manually increased until NO_x emissions exceeded the limit, and then manually decreased until NO_x emissions exceed

the limit. Avenal Prison was then supposed to continuously monitor the WFR to show that they never operated the turbines outside the acceptable WFR range established during the original source test.

District Staff have reviewed the original source test report from 1990 and found no indication that the acceptable WFR range was ever established. Furthermore, consultation with staff at Avenal Prison indicates that records from that period are not available, since the original source test was conducted over 20 years ago and the record keeping requirement at that time was only 2 years. Avenal Prison is unable to manually adjust the WFR because the turbine vendor never provided for manual adjustment and now refuses to provide service for the turbines after losing the operation and maintenance contract. The inability to manually adjust the water injection rate prevents Avenal Prison from conducting a new source test that properly identifies the acceptable WFR range for continuous monitoring.

Turbines with rated output in excess of 10 MW are typically equipped with continuous emissions monitoring systems (CEMS) for NO_x and O_2. Section 6.2.2 of Rule 4703 requires the owner or operator of a gas turbine subject to the rule, with a rated output less than 10 MW and not equipped with an exhaust gas NO_x control device, to monitor operational characteristics recommended by the manufacturer or emission control system supplier and approved by the APCO. A review of the rule history and rule development files demonstrates that exhaust gas NO_x control devices are systems such as selective catalytic reduction (SCR) which are add-on controls to reduce NO_x after it has been created in the combustion process. In contrast, water (or steam) injection helps reduce peak flame temperature and prevent the formation of NO_x. Therefore, these turbines with water injection are required to monitor operational characteristics recommended by the manufacturer in compliance with Section 6.2.2. However, for the Solar Centaur turbines at Avenal Prison, the manufacturer-recommended operational characteristics include the WFR.

Since it is not feasible for Avenal Prison to establish the acceptable WFR range for each turbine, it is not practical for the facility to monitor the WFR as a compliance demonstration mechanism. While Avenal Prison has varied the load on each turbine to try to establish an acceptable WFR range, the resulting range is too narrow to accommodate the natural variability in WFR. In fact, the 2008 NOV stems from the Compliance Inspector's direct observation of WFR indicators that were outside the acceptable WFR range established by load adjustment. Since Avenal Prison is likely to be in violation of the monitoring requirement more or less continuously using that WFR range, this clearly is not an appropriate mechanism for demonstrating compliance. Prohibitory rules generally establish the minimum acceptable control, monitoring, and record keeping requirements, but permit holders obviously have the option of over-complying with the rule requirements. Avenal Prison will over-comply with the rule by

adopting a more stringent monitoring program under Section 6.2.1, which provides for APCO-approved alternate monitoring consisting of one or more of the following:

1. Periodic NOx emission concentrations,
2. Turbine exhaust oxygen concentration,
3. Air-to-fuel ratio,
4. Flow rate of reducing agents added to turbine exhaust,
5. Catalyst inlet and exhaust temperature,
6. Catalyst inlet and exhaust oxygen concentration,
7. or other operational characteristics

To comply with District Rule 4703 requirements, the applicant is proposing to monitor the following parameters:

1. The applicant will take periodic NOx emission concentration measurements with a portable analyzer.

It is noted that this alternative monitoring program is extremely limited in applicability and will also have a limited duration. Avenal Prison is required to be in compliance with the Rule 4703 Tier 3 emission limit by October 1, 2011, and proposes to use a selective catalytic reduction (SCR) system to meet that limit[1]. At that time, this monitoring program will be replaced by the existing monitoring program for turbines with SCR, which requires continuous monitoring of ammonia injection in addition to weekly (and later monthly) monitoring of NO_x emissions using a portable analyzer.

It is also noted that this monitoring program would only satisfy the requirements of Rule 4703. It does not satisfy the monitoring requirements of the stationary gas turbine NSPS, Subpart GGfor continuous monitoring of the WFR. However, 40 CFR 60.13(i) allows the administrator to consider a written application for approval of an alternative to any of the monitoring procedures of Part 60. While §60.13(i)(1) through (9) list a number of specific examples, which do not encompass the proposed monitoring program at Avenal Prison, §60.13(i) states that the administrator's authority to consider alternative proposals includes, but is not limited to, the examples given in items (1) through (9). Therefore, it is determined that the District has the authority, under delegation of authority for administering the NSPS program, to approve such an alternative monitoring program.

A. Control Technology

Water injected into the turbine combustion zone serves to quench the products of combustion, reducing peak temperature and substantially reducing production of thermal NO_x. This control technology is well known, having been incorporated into Subpart GG

[1] Variance C-11-05R, if granted, would extend this deadline to October 1, 2011.

when it was originally adopted in 1979. The NO_x emission reductions from water injection are robust, being dependant on the WFR and proper mixing, rather than the more delicate balance of mixing, ammonia injection, catalyst temperature, and catalyst condition[2] present with an SCR system. Since proper mixing is a design function, while the WFR is automatically controlled and the turbines will, in this installation, automatically shut down if diluent water is lost, it is expected that NO_x emissions from these turbines will not vary significantly over time. A review of the raw source test data from 2008 through 2010 (2011 data is not available yet) supports this conclusion.

B. Monitoring Parameters

NOx, CO, and O_2 will be directly measured utilizing a District-approved portable analyzer. The NOx and CO readings in conjunction with the O_2 readings will enable the facility to correct the actual NOx and CO concentrations to concentrations at 15% O_2, which is what is required to show compliance.

C. Frequency

As noted previously, water injection is a robust NO_x emission reduction technique that is not expected to experience significant variability in control efficiency. Furthermore, the Avenal Prison turbines are limited to NO_x emissions of 35 ppmv at 15% O_2, whereas source testing has consistently demonstrated actual NO_x emissions of 20-25 ppmv. The combination of a robust control technique and large margin for compliance with the emission limit suggest that the weekly monitoring of NO_x emissions required for SCR-equipped combustion turbines would be excessively burdensome without corresponding emission reduction or public health benefit if required at Avenal Prison. Therefore, NOx, CO, and O2 readings with a portable analyzer will be required on a monthly basis.

D. Reporting

The permittee must notify the District within 1 hour if the operator is unable to return emissions to within the permitted emission limit within 8 hours after monitoring with a portable analyzer shows that the unit is operating in excess of the emission limit.

E. Testing

Source testing for NOx and CO occur on an annual basis (as required by District Rule 4703). If portable analyzer readings indicated that the actual emissions exceed the permitted emissions limits and this condition is not corrected within 8 hours, a source test

[2] Catalyst condition refers to the fact that catalyst performance tends to degrade over time, until it becomes unacceptable and the catalyst must be replaced or reconditioned to restore performance. This degradation comes from a variety of factors, including blinding and poisoning of catalyst elements by contaminants.

must be conducted within 60 days to demonstrate compliance with the applicable emission limits.

F. Proposed Permit Conditions

- The permittee shall monitor and record the stack concentration of NOx, CO, and O2 at least once every month (in which a source test is not performed) using a portable analyzer that meets District specifications. Monitoring shall not be required if the unit is not in operation, i.e. the unit need not be started solely to perform monitoring. Monitoring shall be performed within 5 days of restarting the unit unless monitoring has been performed within the last month. [District Rule 4703 and 40 CFR 60.334]

- If the NOx and/or CO concentrations, as measured by the permittee with a portable analyzer, exceed the permitted emission limits, the permittee shall notify the District and return the NOx and CO concentrations to the permitted emission limits as soon as possible but no longer than 8 hours after detection. If the permittee's portable analyzer readings continue to exceed the permitted emissions limits after 8 hours, the permittee shall notify the District within the following 1 hour, and conduct a certified source test within 60 days to demonstrate compliance with the permitted emissions limits. In lieu of conducting a source test, the permittee may stipulate that a violation has occurred, subject to enforcement action. The permittee must correct the violation, show compliance has been re-established, and resume monitoring procedures. If the deviations are the result of a qualifying breakdown condition pursuant to Rule 1100, the permittee may fully comply with Rule 1100 in lieu of performing the notification and testing required by this condition. [District Rules 2201 and 4703]

- All NOx, CO, and O2 emission readings shall be taken with the unit operating at conditions representative of normal operation or under the conditions specified in the Permit to Operate. The NOx, CO and O2 analyzer shall be calibrated, maintained, and operated in accordance with the manufacturer's specifications and recommendations or a protocol approved by the APCO. Analyzer readings taken shall be averaged over a 15 consecutive-minute period by either taking a cumulative 15 consecutive-minute sample reading or by taking at least five readings, evenly spaced out over the 15 consecutive-minute period. [District Rules 2201 and 4703]

- When this unit is modified to comply with the Tier 3 emission limits in Rule 4703, the monitoring program shall be revised as appropriate for the NOx controls applied to the Tier 3-compliant unit. [District Rule 4703]