



Tucson Electric Power

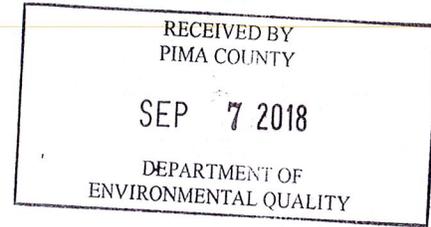
88 East Broadway Blvd.
Tucson, AZ 85701-1720

Area Code 520
Telephone 571-4000

Hand Delivery

September 7, 2018

Mr. Rupesh Patel
Air Program Manager
Pima County Department of Environmental Quality
33 N. Stone Ave, Suite 700
Tucson, Arizona 85701



Subject: Compliance Assurance Monitoring (“CAM”) Plan for Carbon Monoxide
Irvington Generating Station – Class I Air Quality Permit No. 1052

Dear Mr. Patel:

PCDEQ announced a final permit decision on August 8, 2018 to issue PSD Air Quality Permit No. 1052 for the RICE project proposed by TEP to be installed and operated at its Irvington Generating Station. Condition I.O.2.a, Part B of the permit requires TEP to “prepare and submit a CAM Plan to the Department for review within 30 days of issuance of this Permit.” TEP hereby submits the CO CAM plan in accordance with this permit requirement. If you have any questions in this matter, please feel free to contact me at (520) 918-8316.

Sincerely,

Charles W. Komadina, Manager
Corporate Environmental Compliance & Permits

cc: E. Bakken, TEP
C. Spencer, TEP
Z. Fang, TEP

Irvington Generating Station
Carbon Monoxide Compliance Assurance Monitoring Plan for Units RICE01 –RICE10

The Permittee shall maintain and continuously operate Continuous Parameter Monitoring Systems (CPMS) to measure catalyst inlet temperature and catalyst pressure drop which are indicators indicative of good air pollution control practices for operation of each RICE01 – RICE10 and its associated oxidation catalyst in a manner necessary to comply with CO emission standards. The indicator parameters are identified in Table 1.

Table 1: Summary of CAM Requirements applicable to CO for Units RICE01 – RICE10

<i>Indicators</i>	<i>Indicator No. 1: Catalyst Inlet Temperature</i>	<i>Indicator No. 2: Catalyst Pressure Drop</i>
I. Measurement Approach	The Continuous Parametric Monitoring System (CPMS) shall collect catalyst inlet temperature of the exhaust of each RICE01 – RICE10. The chamber temperature for each operating RICE is monitored with a temperature sensor.	The Continuous Parametric Monitoring System (CPMS) shall collect the oxidation catalyst pressure drop across the catalyst for each operating RICE. The pressure drop will be measured using a differential pressure measurement system. An increase in pressure differential over time indicates that the catalyst bed is fouled or plugged. Changes in pressure differential are likely to be gradual.
II. Indicator Range	An excursion is defined as failure to maintain the temperature of the stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F.	An excursion is defined as failure to maintain the oxidation catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test. Does not apply during periods of startup, and malfunctions.
	An excursion from the indicator ranges does not necessarily indicate an exceedance, deviation, or violation, but is indicative of the need for investigation and possible corrective action to minimize the potential for an exceedance, deviation, or violation.	
III. Performance Criteria - A. Data Representativeness	The temperature sensor is located at the inlet to the catalyst. The temperature sensor will be capable of measuring a temperature range between 450 °F and 1350 °F, and the temperature sensor must have a minimum tolerance of 5 °F or 1 percent of the measurement range, whichever is larger. Validation checks will be conducted at least annually. Data will be kept by the CPMS.	The pressure drop across the catalyst is measured at the catalyst inlet and exhaust. The minimum accuracy of the device is +/- 0.25 inches of water.
III. Performance Criteria - B. Verification of Operation Status	CPMS shall be installed, operated, and maintained for each RICE.	CPMS shall be installed, operated, and maintained for each RICE.
III. Performance Criteria - C. QA/QC Practices & Criteria	Accuracy of the temperature sensor will be verified by a second, or redundant, temperature probe inserted into the inlet to the catalyst with a hand held meter. This validation check will be conducted at least annually. The acceptance criteria are +/- 30 °F.	Pressure gauge taps checked quarterly for plugging. Pressure gage calibrated quarterly.
III. Performance Criteria - D. Monitoring Frequency	The CPMS shall monitor inlet temperature continuously, except for periods of CPMS malfunction, and associated repairs.	The CPMS shall monitor pressure drop continuously, except for periods of CPMS malfunction, and associated repairs.
III. Performance Criteria - E. Data Collection Procedure	The CPMS shall collect catalyst inlet temperature for each catalyst at least once every 15-minutes, except for periods of CPMS malfunction and associated repairs.	The CPMS shall collect data on the pressure drop across each catalyst at least once every 15-minutes, except for periods of CPMS malfunction and associated repairs.
III. Performance Criteria - F. Averaging Period	Not applicable	Not applicable

Irvington Generating Station
Carbon Monoxide Compliance Assurance Monitoring Plan for Units RICE01 –RICE10

Monitoring Approach Justification

Emission Units

RICE01 – RICE10

Applicable Requirement Monitoring Requirements

This CAM plan is required to provide indication of performance of the oxidation catalyst systems and, thus, reasonable assurance of compliance with the carbon monoxide BACT emission limits for each RICE. Temperature and pressure drop and the proposed indicator ranges are appropriate for the reasons established by U.S. EPA in establishing enhanced monitoring procedures for engines of this type and configuration in 40 CFR part 63, subpart ZZZZ.

Emission Limits

Permit condition II.A.3.a limits CO emissions from each engine to 4.43 lbs/hr, excluding startup periods.

Monitoring Requirements

The monitoring approach outlined in this plan applies to the oxidation catalysts on RICE01 – RICE10. The oxidation catalyst lowers CO emissions. The catalyst are passive units and have no mechanical components.

Rationale for Selection of Performance Indicators (See Table 1 – Summary of CAM Requirements Applicable to CO for Units RICE01 – RICE10)

Temperature into the catalyst unit is measured because temperature excursions can indicate issues with engine operation and can prevent the chemical reduction from taking place in the catalyst bed. When the exhaust inlet gas temperature is too low the intended chemical reaction is reduced. An exhaust gas temperature that is too high can indicate engine problems and could damage the catalyst.

The pressure drop across the oxidation catalyst is measured continuously and the CPMS collects data on the pressure drop across each catalyst at least once every 15-minutes, except for periods of CPMS malfunction and associated repairs. A significant change in pressure drop from the benchmark (initial testing) can indicate that the catalyst is becoming fouled, slowing gas flow through the unit, and lowering the effectiveness of the catalyst to control CO emissions.

For these reasons the following performance indicators were selected.

Indicator 1 - Temperature at Inlet to the Oxidation Catalyst

Indicator 2 - Pressure Drop Across the Oxidation

Indicator 1 - Temperature at Inlet to the Oxidation Catalyst

Except during periods of startup, the permittee shall maintain the temperature of the stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450 °F and less than or equal to 1350 °F.

Indicator 2 - Pressure Drop Across the Oxidation Catalyst

Except during periods of startup, the permittee shall maintain the oxidation catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test.

**Irvington Generating Station
Carbon Monoxide Compliance Assurance Monitoring Plan for Units RICE01 –RICE10**

Rationale for Selection of Indicator Ranges (See Table 1 – Summary of CAM Requirements Applicable to CO for Units RICE01 – RICE10)

Each catalyst bed is designed to work optimally at the selected indicator ranges for inlet temperature. The temperature ranges selected are manufacturer's suggested operating parameters for optimal chemical reaction.

The indicator range for catalyst pressure drop is a pressure drop that deviates less than two inches of H₂O from the benchmark testing. Once again, the range was selected based on manufacturer's specifications. A change in pressure drop indicates potential fouling of the catalyst which requires cleaning or replacement of the catalyst bed.

Monitoring Requirements

The Permittee shall prepare a site-specific monitoring plan that addresses the monitoring system design, data collection, and the quality assurance and quality control elements.

The Permittee shall install, operate, and maintain continuous parameter monitoring system (CPMS) for each RICE. The CPMS shall be in continuous operation according to the procedures in the site-specific monitoring plan. Except for monitor malfunctions, associated repairs, required performance evaluations, and required quality assurance or control activities, the Permittee shall monitor continuously at all times that the stationary RICE is operating. A monitoring malfunction is any sudden, infrequent, not reasonably preventable failure of the monitoring to provide valid data. Monitoring failures that are caused in part by poor maintenance or careless operation are not malfunctions.

In addition, items 1 – 5 below are to be followed.

1. The CPMS shall collect data at least once every 15 minutes.
2. For a CPMS for measuring temperature range, the temperature sensor must have a minimum tolerance of 5 °F or 1 percent of the measurement range, whichever is larger.
3. The Permittee shall conduct the CPMS equipment performance evaluation, system accuracy audits, or other audit procedures specified in the site-specific monitoring plan at least annually.
4. The Permittee shall conduct a performance evaluation of each CPMS in accordance with the site-specific monitoring plan.
5. The CPMS shall be installed and monitoring parameters shall be established during the initial performance test. The following parameters shall be monitored during the performance test and during operation:
 - a. Catalyst inlet temperature
 - b. Catalyst pressure drop

1. Response to Excursions or Exceedances

Upon detecting an excursion or exceedance, restore operation of the RICE (including the control device) to its normal or usual manner of operation as expeditiously as practicable in accordance with good air pollution control practices for minimizing emissions. The response shall include minimizing the period of any startup, shutdown, or malfunction, and taking any necessary corrective actions to restore normal operation and prevent the likely recurrence of the cause of an excursion or exceedance (other than those caused by excused startup or shutdown conditions).

Irvington Generating Station
Carbon Monoxide Compliance Assurance Monitoring Plan for Units RICE01 –RICE10

Actions may include:

- 1) Initial inspection and evaluation of catalyst,
- 2) Recording that operations returned to normal without operator action,
- 3) Shutdown of RICE
- 4) or any necessary follow-up actions to return operations to within the indicator range, designated condition, as applicable.

2. Approved Monitoring and Compliance Schedule

To provide a reasonable assurance of compliance with emission limitations or standards for the anticipated range of operations at a pollutant-specific emissions unit, the approved CAM plan document shall include monitoring criteria that satisfies 40 CFR 64.3 and 40 CFR 64.4. The Permittee shall submit monitoring 90 days after issuance of this permit, but in no case shall the Permittee submit revised monitoring more than 180 days from the date of issuance of the draft or final permit.

If the Permittee does not submit the monitoring in accordance with the compliance schedule as required or if the Control Officer disapproves the monitoring submitted, the source owner or operator shall be deemed not in compliance with 40 CFR Part 64, unless the Permittee successfully challenges the disapproval.

3. Documentation of Need for Improved Monitoring

After approval of monitoring under this part, if the Permittee identifies a failure to achieve compliance with an emission limitation or standard for which the approved monitoring did not provide an indication of an excursion or exceedance while providing valid data, or the results of compliance or performance testing document a need to modify the existing indicator ranges or designated conditions, the Permittee shall promptly notify the Control Officer and, if necessary, submit a proposed modification to the part 70 or 71 permit to address the necessary monitoring changes. Such a modification may include, but is not limited to, reestablishing indicator ranges or designated conditions, modifying the frequency of conducting monitoring and collecting data, or the monitoring of additional parameters.

4. Reporting and Recordkeeping Requirements

Excursions shall be reported as required by Permit #1052, Condition VII.A.1 of Part "A". The report shall include, at a minimum, the following:

Summary information on the number, duration and cause (including unknown cause, if applicable) of excursion or exceedances, as applicable, and the corrective actions taken; and

Summary information on the number, duration and cause (including unknown cause, if applicable) for monitoring downtime incidents (other than downtime associated with zero and span or other daily calibration checks, if applicable).

5. Minimum Data Availability Requirement

The Permittee is provided a 95% daily reading recordkeeping deviation allowance.