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**Technical Support Document
Title V Permit Renewal
Arizona Public Service Company - Saguaro Power Plant
Permit #V20692.R01**

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This technical support document (TSD) summarizes some of the main items analyzed for this facility's original permit. More in-depth discussion can be found in previous TSDs from 2001-2014.

1. APPLICANT

Arizona Public Service Company
400 North 5th Street, Mail Station 9303
Phoenix, Arizona 85004

2. BACKGROUND

2.1 PROJECT LOCATION

This permit pertains to an electrical power plant owned and operated by Arizona Public Service Company, located at Mile Post Marker 228, I-10, Red Rock, Arizona. The SIC Code is 4911. The source is situated in an area classified as attainment for all pollutants.

2.2 PROCESS DESCRIPTION

The source consists of 3 electrical generating units, including 2 "grandfathered" generating units: two 55 mW Westinghouse W-501AA simple cycle gas turbine generators (CT1 & CT2). The "grandfathered" generating units were installed between 1953 and 1973. As such, while those units fall subject to "existing source" performance standards, they antedate all applicable new source performance standards. Two cooling towers are used to supply cooled circulating water to the unit condensers. The third unit is CT3, a GE 7EA simple cycle combustion turbine rated at 80 mW. All three units are currently permitted to burn only natural gas.

The permit currently allows the installation and operation of fogging systems on CT1 and CT2 but APS has not done so to date.

This source constitutes a major source of CO and NO_x, and operates under authority of a Title V unitary permit. Since the steam and combustion turbines have not been modified or reconstructed the facility does not have to go through Prevention of Significant Deterioration (PSD).

2.3 PERMITTING HISTORY

The Title V permit for this facility, V20601.000, was issued on 10/4/01. It included the requirements from previous installation permits A20501.000 and A20501.R02, and authorized the installation and operation of the GE Frame 7EA once the 5 TM2500 units were removed.

Revision V20601.R01, issued 1/22/2002, corrected an error in the original permit by increasing the allowable percentage of sulfur in the fuel for the steam generators from 0.8 to 0.9 percent.

Revision V20601.R02 changed the basis for emissions averaging to assess compliance with the 7EA turbine emission caps from daily to monthly. In addition, requirements relating to photochemical reactive solvents were removed. These requirements were deleted from SIP at 66 FR 49293 on 9/27/2001.

Renewal V20627.000, issued 12/22/06, updated the list of Federally Enforceable Applicable Requirements, and the requirements applying to the TM2500 turbine units were removed since these units were replaced by CT3. In addition, this renewal authorized the installation and operation of an inlet fogging with overspray systems on the simple cycle turbines (CT1 and CT2).

Renewal V20649.000, issued 9/15/11, added recently promulgated 40 CFR 63 Subpart ZZZZ requirements as they applied to an emergency generator located at the Solar Trough Facility.

Revision V20649.R01 removed the authority to operate the 2 steam-electric units (Steam Unit 1 and 2), removed the authority to burn fuel oil as an alternative operating scenario and removed the authority to operate an emergency generator located at the Solar Trough Facility. All of the equipment involved in these changes and the Solar Trough Facility were decommissioned by the permittee.

Revision V20649.R02 allowed for the replacement of both Cooling Tower units. The new cooling towers have less capacity than the original units resulting in less potential emissions. The replacement also did not trigger any additional monitoring or recordkeeping requirements.

Renewal, V20669.000, removed outdated references to previously decommissioned equipment and to initial CEMs evaluations.

Revision, V20692.R01 authorizes the facility to install and operate a Battery Energy Storage System (BESS) intended to expand on the existing solar photovoltaic (PV) system. The intended use of BESS is to increase the availability of solar powered electricity produced by renewable energy and to provide a flexible response to the variable load requirements during peak demand to its consumers. Both the current Solar PV and the new BESS facilities are located adjacent to Saguaro Power Plant, and therefore incorporated under this permit as one facility. The only emission unit associated with the BESS facility is a 755 HP (578 kW) diesel emergency generator. The fugitive dust requirements would apply to the entire Saguaro Power Plant and the Solar BESS sites.

2.4 COMPLIANCE/ENFORCEMENT HISTORY

The last inspection of this facility was conducted in August of 2015. The facility was in compliance. The annual RATA tests were conducted in August 2015.

This facility does not have any history of compliance problems or enforcement.

3. EMISSIONS FROM THE PROJECT

3.1 ACTUAL EMISSIONS

2021 Emissions (TPY)						
CO	NO _x	SO _x	PM10	PM2.5	VOC	HAP
25.25	56.47	0.35	3.83	3.83	1.21	0.59

3.2 POTENTIAL EMISSIONS

Maximum Emission Summary (tons/year) - Potential to Emit for the equipment remaining at the site.

	SO ₂	NO _x	PM10	PM2.5	CO	VOC	HAPs	CO _{2e}
CT1	2.5	1316.1	27.1	27.1	337.3	8.6	4.8	480,744
CT2	2.5	1316.1	27.1	27.1	337.3	8.6	4.8	480,744
CT3	2.5	135.3	27.0	27.0	228.8	8.6	4.8	477,672

C.Tower 1 ¹			0.019					
C.Tower 2 ²			0.019					
Emergency Diesel Generator	0.003	1.74	0.012	0.012	0.19	1.98	0.0	327.2
Total PTE	7.50	2,769.2	81.3	81.3	903.6	27.8	14.4	1,439,487

3.3 GREENHOUSE GASES

This renewal serves to quantify the GHG emissions for this facility in accordance with Greenhouse Gas Tailoring Rule (75FR 17004). The facility is also subject to the Mandatory Greenhouse Gas reporting rule (40 CFR 98). This reporting rule is currently not included in the definition of applicable requirement in 40 CFR 70.2 or 71.2. Even though the requirements contained in the GHG reporting rule are not considered applicable requirements under the title V regulations and accordingly will not be listed in the Title V operating permit, the source is not relieved from the requirement to comply with the GHG reporting rule separately from compliance with their title V operating permit.

4. AIR QUALITY IMPACTS ANALYSIS

The following provides a summary of the facility-specific ambient impacts, as described in the technical support document for the original Title V permit issued on 10/01. For a more in-depth explanation of the Impact Analysis, see the TSD from 2001.

4.1 SO₂ EMISSIONS

During the initial Title V permit review for this facility, PCAQCD performed a modeling analysis to assess the SO₂ emission impact from the steam units and the combustion turbines existing at the time (not including CT3) when combusting secondary fuel. From that analysis, PCAQCD concluded that the fuel-sulfur content in the permit adequately assured that the facility itself would not cause a violation of the SO₂ ambient air quality standard. In addition, the Acid Rain sulfur dioxide allowances establish a practical constraint on this facility from ever emitting anywhere near its SO₂ emission potential.

4.2 NO_x EMISSIONS

PCAQCD performed a modeling analysis during the initial Title V permit review for this facility, to assess the NO_x ambient impacts from the “grandfathered” units, and concluded that this facility will not cause a violation of the NO_x ambient air quality standards. The table below shows the results.

4.3 PM₁₀ EMISSIONS

PCAQCD performed a modeling analysis during the initial Title V permit review for this facility, to assess the PM₁₀ ambient impacts from the “grandfathered” units, and concluded that this facility will not cause a violation of the ambient air quality standards. The table below shows the results.

4.4 CO EMISSIONS

¹ The existing Cooling Towers each had a PM₁₀ PTE of 0.9 tpy.

PCAQCD performed a modeling analysis during the initial Title V permit review for this facility, to assess the CO ambient impacts from the “grandfathered” units, and concluded that this facility will not cause a violation of the CO ambient air quality standards. The table below shows the results.

WORST-CASE AMBIENT IMPACTS

Pollutant	Max. Concentration (µg/m ³)	NAAQS average	Allowable Concentration (µg/m ³)	Actual/Allowable (%)
SO ₂	181.5	3-hr	1,300	14
SO ₂	25.8	24-hr	365	7.1
SO ₂	3.73	annual	80	4.6
NO _x	0.26	annual	100	0.26
CO	11.5	1-hr	40,000	0.03
CO	2.3	8-hr	10,000	0.02
PM ₁₀	1.71	24-hr	150	1.1
PM ₁₀	0.17	annual	50	0.3

Note: These impacts only reflect the emissions from the steam units 1 and 2, CT1 and CT2. However, CT3 will only add limited additional emissions, having a negligible impact on the values shown in the table. Additionally, permit revision V20649.R01 removed authorization to operate steam units 1 and 2.

WORST-CASE AMBIENT IMPACTS + BACKGROUND EMISSIONS

Pollutant	Max. Concentration (µg/m ³)	Background Concentration ² (µg/m ³)	Total Allowable (µg/m ³)	NAAQS Allowable (µg/m ³)	Maximum/Total/Allowable (%)	
SO ₂ (3-hr)	182	21.3	203.3	1,300	1.6	15.6
SO ₂ (24-hr)	25.8	8	33.8	365	2.2	9.3
SO ₂ (annual)	3.73	2.7	6.4	80	3.4	8.0
NO _x (annual)	0.26	14.2	14.5	100	14.2	14.5
CO (1-hr.)	11.5	2052	2064	40,000	5.1	5.2
CO (8-hr.)	2.3	1,368	1,370	10,000	13.7	13.7
PM ₁₀ (24-hr.)	1.71	104.5	106.2	150	69.7	70.8
PM ₁₀ (annual)	0.17	37.1	37.3	50	74.2	74.6

4.5 AIR TOXICS

² SO₂ background from www.epa.gov/air/data/monvals.html, based on lowest annual mean, lowest 2nd max. for 3-hr and 24-hr averages; there are no SO₂ monitors within about 40 miles of this facility. NO_x data taken at Saguaro National Monument for years 1995 and 1996. PM₁₀ data taken at Coolidge for years 1995 through 1999. CO data taken at Casa Grande for years 1995 through 1997.

During the initial Title V permit review, modeling of HAPS was conducted, and the results were compared with the Arizona Ambient Air Quality Guidelines. None of the AAAQGs were exceeded.

5. TITLE V PERMIT ANALYSIS

5.1 APPLICABLE REQUIREMENTS -GENERAL

The Saguaro Power Plant commenced operation in 1954. The plant, with the exception of CT3, antedates any installation permit, PSD or NSPS requirements. Permittee has accepted federally enforceable limits on emissions from CT3 in order to avoid PSD review.

The 2001 TSD includes an explanation of general facility-wide applicable requirements.

5.2. APPLICABLE REQUIREMENTS

5.2.1 REASONABLE PRECAUTIONS SIP APPROVED 4/6/10

This was already part of the Pinal County Code of Regulations but became SIP approved in 2010. It requires the applicant to take measures to prevent fugitive dust emissions.

5.2.2 COMPLIANCE ASSURANCE MONITORING (CAM) - 40 CFR 64

The CAM rule is applicable to pollutant-specific emissions units at major sources when the emission unit is subject to an emission limit or standard, the emission unit uses a control device to achieve compliance with such emission limit or standard, and the emission unit has potential pre-control device emissions equal or above major source thresholds.

As indicated in the V20627.000 renewal permit application (1/04/06), page 8-20, the potential pre-control device emissions for the steam units, CT1 and CT2 could potentially be subject to the CAM rule for one or more of the criteria pollutants and HAPs. However, since none of these units are equipped with control devices, CAM is not applicable. CT-3's pre-control device emissions are below the major source threshold, and therefore CAM is not applicable to this unit either.

5.2.3 MACT FOR TURBINES - 40 CFR 63 SUBPART YYYY

Subpart YYYY of 40 CFR 63 was promulgated on 3/5/04. It establishes national emission limitations and operational limitations for HAP emissions from stationary combustion turbines located at major sources of HAP emissions. The Saguaro facility has the potential to emit above major source threshold of HAPs. Per 40§63.6090(a)(1), the turbines at this facility are existing, and in accordance with 63.6090(b)(4), these turbines do not have to meet the requirements of the subpart and of subpart A. No initial notification is necessary either.

5.2.4 NSPS FOR EMERGENCY GENERATOR – 40 CFR PART 60 SUBPART IIII

The 755 HP (578 kW) emergency diesel generator is subject to the Standards of Performance for Stationary Compression Internal Combustion Engines, Subpart IIII.

5.3 REGULAR COMPLIANCE REPORTING/PERFORMANCE TEST REPORTING

The CT3 unit falls subject to the SO₂ and NO_x emission limitations of the Acid Rain Program, and must comply with the monitoring requirements of 40 CFR Part 75 for SO₂, NO_x and CO₂. CT1 and CT2 are grandfathered, and one of these units will be tested for CO and NO_x to verify emission rates.

The permit includes a testing regime for CO and NO_x which is only triggered when emissions show that the facility is being utilized above a 10% capacity factor. Otherwise, while the facility is not being utilized on a frequent basis, emission factors and parametric monitoring are used for compliance demonstrations.

Semi-annual reports required by the permit require sufficient information to adequately show compliance.

6. CONCLUSION

Based on the information supplied by Applicant and analyses conducted by the PCAQCD, PCAQCD concludes that the proposed project will not cause or contribute to a violation of any federal ambient air quality standard or cause any applicable PSD increment to be exceeded. Therefore, PCAQCD intends to issue to Applicant the permit renewal.