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PART 70
TECHNICAL SUPPORT DOCUMENT
(STATEMENT of BASIS)

APPLICATION FOR:

Significant Revision of Part 70 Operating Permit

SUBMITTED BY:
Broadbent & Associates

Source ID: 00393

LOCATION:
435 Fourth Street
Henderson, Nevada 89015

SIC code 4911, "Electric Services"
NAICS code 221112, "Fossil Fuel Electric Power Generation"

Application Received: February 27, 2023

TSD Date: September 18, 2023

EXECUTIVE SUMMARY

Saguaro Power Company is an electricity and steam generating operation located at 435 Fourth Street, Henderson, Nevada 89015, which is in Hydrographic Area 212 — the Las Vegas Valley. Hydrographic area 212 was designated a moderate nonattainment area for ozone on January 5, 2023, for the 2015 ozone National Ambient Air Quality Standards and designated attainment for the remaining regulated air pollutants. All generating and support processes at the site are grouped under SIC code 4931, “Electric and Other Services,” and NAICS code 221112, “Fossil Fuel Electric Power Generation.”

Saguaro is a categorical stationary source, as defined by AQR 12.2.2(j)(22). The source has a combined fossil-fuel boiler rating of more than 250 MMBtu/hr. Saguaro operates under the Title V Part 70 Operating Permit program and is a major stationary source for NO_x, a minor source for PM₁₀, PM_{2.5}, CO, SO₂, VOCs, and HAPs, and a source of greenhouse gas emissions. Saguaro operates 35 MW natural gas, combined cycle, combustion turbine generators (CTGs); diesel starter engines; auxiliary natural gas-fired boilers; a cooling tower; and 25 MMBtu/hr supplemental-firing duct burners. Additionally, Saguaro Power Company operates a 29.1 MW extraction/condensing steam turbine generator system and an ammonia storage and injection system as insignificant activities. The turbines are subject to the requirements of 40 CFR Part 60, Subparts A and GG, and the facility is subject to 40 CFR Parts 72 and 75, and 40 CFR Part 63, Subpart ZZZZ.

Table 1: summarizes the potential to emit (PTE) for each regulated air pollutant.

Table 1: Source-wide PTE (tons per year)

Pollutant	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP ¹	GHG
PTE	31.79	31.07	158.45	90.13	3.10	12.84	9.00	544,830
Major Source Threshold (Categorical)	100	100	100	100	100	100	10/25	

¹Major stationary thresholds are 10 tpy for a single HAP and 25 tpy for combined HAP.

DAQ will continue to require the sources to estimate their GHG potential to emit in terms of each individual pollutant (CO₂, CH₄, N₂O, SF₆ etc). The TSD includes these PTEs for informational purposes.

DAQ has received delegated authority from the U.S. Environmental Protection Agency to implement the requirements of the Part 70 OP. Based on the information submitted by the applicant, supplemental information provided to the application, and a technical review performed by DAQ staff, the draft Part 70 OP to Saguaro Power Company is proposed.

This Technical Support Document (TSD) accompanies the proposed Part 70 Operating Permit for Saguaro Power Company.

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I. COMMON ACRONYMS AND ABBREVIATIONS

AQR	Clark County Air Quality Regulations
AST	aboveground storage tank
ATC	Authority to Construct
CAAA	Clean Air Act, as amended, or Clean Air Act Amendments
CE	control efficiency
CEMS	continuous emissions monitoring system
CF	control factor
CFR	United States Code of Federal Regulations
CO	carbon monoxide
CPI	Urban Consumer Price Index
DAHS	data acquisition and handling system
DAQ	Division of Air Quality
DEM	digital elevation model
DES	Department of Environment and Sustainability
EF	emission factor
EO	Executive Order
EPA	United States Environmental Protection Agency
ERC	emission reduction credit
EU	emission unit
GDO	gasoline dispensing operation
HAP	hazardous air pollutant
HP	horsepower
HRSG	heat recovery steam generating unit
H ₂ S	hydrogen sulfide
MMBtu	Millions of British Thermal Units
NEI	net emission increase
NESHAP	National Emission Standards for Hazardous Air Pollutants
NH ₃	ammonia
NMHC	non-methane hydrocarbons
NO _x	nitrogen oxides
NOV	Notice of Violation
NPC	Nevada Power Company
NRS	Nevada Revised Statutes
NSPS	New Source Performance Standards
NSR	New Source Review
OP	Operating Permit
PM ₁₀	particulate matter less than 10 microns
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTE	potential to emit
RATA	Relative Accuracy Test Audit
RMP	risk management plan
scf	standard cubic feet
SIP	State Implementation Plan
SO ₂	sulfur dioxide
TDS	total dissolved solids
TSD	Technical Support Document
TSP	total suspended particulates
ULNB	ultra-low NO _x burner
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	volatile organic compound

II. SOURCE INFORMATION

A. General

Permittee	Saguaro Power Company
Mailing Address	435 Fourth Street, Henderson, Nevada 89015
Contacts	Rob May
Phone Number	(702) 558-1131
Fax Number	(702) 564-2753

B. Process Description

Saguaro Power Company (Saguaro) operates two natural gas-combustion turbines (EUs: A01 and A02) each producing up to 35 MW of electric power. Both turbine exhaust systems are equipped with a heat recovery steam generator that uses the heat from exhaust gases to produce steam. Supplemental heat is provided by natural gas-fired duct burners (EUs: F05, F05a, F06, and F06a). The steam is diverted to the turbines for NO_x control and a 29.1 MW steam turbine generator. Two 520-hp starter diesel engines (EUs: A03 and A04) turn the turbines until the combustion process is self-sustaining. The starter engines are employed only during startups. Saguaro is permitted to operate two natural gas-fired boilers (EUs: A05 and A06), under former contractual obligations, to deliver steam to local businesses when the combustion turbines are not operating. Saguaro operates a three-celled cooling tower (EUs: A09a-A09c). The cooling tower maintains the process equipment temperature by circulating water through the facility.

C. Current Permitting Action

After a brief hiatus beginning September 30, 2022, Saguaro intends to restart operations in June 2023. Previously, Saguaro was exempted from the acid rain permit program requirements under 40 CFR Part 72.6(b)(5). Saguaro's commitment to maintain cogeneration power under the current power purchase agreement (PPA) has terminated. As they no longer provide this service, they are not eligible for the exemption from the acid rain program requirements. They will startup under a new PPA to include an acid rain permit.

Under AQR 12.5.2.14, "Any permit revision for purposes of the "acid rain" portion of the permit shall be governed by regulations promulgated by the Administrator under Title IV of the Clean Air Act and shall require a significant permit revision. An application for a significant revision to incorporate the relative acid rain provision into the existing Title V Operating Permit (OP) was submitted by the permittee on February 27, 2023.

Additionally, the source notified the Clark County Department of Environment and Sustainability - Division of Air Quality (DAQ) on February 9, 2023, that they are removing the operational

capability for the turbines to utilize diesel fuel. The change in the potential to emit (PTE) and residual conditions removal will be reflected in this revision.

Lastly, a permit format and style change has been incorporated into this action.

D. Emissions Unit List

Table II-D-1 contains the list of emission units for the affected facility.

Table II-D-1: List of Emission Units

EU	Rating	Description	Make	Model No.	Serial No.	SCC
A01	35 MW	Combustion Turbine Generator #1 with a fired HRSG	GE	PG6541B	295525	20100201
A02	35 MW	Combustion Turbine Generator #2 with a fired HRSG	GE	PG6541B	295524	20100201
A03	520 hp	Detroit Diesel Starter Engine, Combustion Turbine Generator #1	Detroit	71237300	12VA083956	20300202
A04	520 hp	Detroit Diesel Starter Engine, Combustion Turbine Generator #2	Detroit	71237300	12VA083901	20300202
A05	218 MMBtu/h	Auxiliary Boiler #1	Indeck/Volcano	0-7-2000		3100414
A06	86 MMBtu/hr	Auxiliary Boiler #2	Nebraska	NOS 2A/S-55	032-88	3100414
A09 a	7,666 gpm each	Cooling Tower, 3 cells	Thermal-Dynamics Towers Inc.	TD-3030-3-2424CF		38500101
A09 b						
A09 c						
F05	25 MMBtu/hr	Supplemental Duct Burner, Skid #1	John Zink	LDR-11-LE	S82733	20100101
F05 a	25 MMBtu/hr	Supplemental Duct Burner, Skid #1	John Zink	LDR-11-LE	S82733	20100101
F06	25 MMBtu/hr	Supplemental Duct Burner, Skid #2	John Zink	LDR-11-LE	S82733	20100101
F06 a	25 MMBtu/hr	Supplemental Duct Burner, Skid #2	John Zink	LDR-11-LE	S82733	20100101

III. EMISSIONS INFORMATION

A. Source-wide Potential to Emit

Saguaro is a major stationary source for NO_x, a minor source for PM₁₀, PM_{2.5}, CO, SO₂, VOCs, and HAPs, and a source of greenhouse gas emissions. Table III-A-1 shows the facility's PTE.

Table III-A-1: Source-wide PTE (tons per year)

Pollutant	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	GHG
PTE	31.79	31.07	158.45	90.13	3.10	12.84	9.00	544,830

Stationary sources that emit 25 tons or more of NO_x and/or emit 25 tons or more of VOCs from their emission units, insignificant activities, and exempt activities during a calendar year shall submit an annual emissions statement for both pollutants. Emissions statements must include actual annual NO_x and VOC emissions from all activities, including emission units, insignificant activities, and exempt activities. Emissions statements are separate from, and in addition to, the calculated annual emissions reported each year for all regulated air pollutants (i.e., the annual emissions inventory report). [AQR 12.9.1]

Additionally, the PTE was revised to reflect removing the diesel combustion component of the turbines (EUs: A01 and A02). The PTE now represents natural gas combustion at 8,760 hours per year. Refer to Section H — Attachments for the calculation of the values for each regulated pollutant. The attachments also include Table III-H-4 the startup and shut down emission rates as referenced in the permit.

B. Applicable Requirements

The applicable Acid Rain Program regulations are contained in 40 CFR Parts 72 through 78:

- 40 CFR Part 72: Permits Regulation
- 40 CFR Part 73: SO₂ Allowance System
- 40 CFR Part 74: Opt-In
- 40 CFR Part 75: Continuous Emissions Monitoring
- 40 CFR Part 76: Acid Rain Nitrogen Oxides Emission Reduction Program
- 40 CFR Part 77: Excess Emissions
- 40 CFR Part 78: Appeal Procedures

C. Compliance Demonstration

A continuous emission monitoring system (CEMS) is required by 40 CFR Part 75 to sample, analyze, measure, and provide, by recording readings at least once every 15 minutes using an automated data acquisition and handling system, a permanent record of NO_x emissions or stack gas volumetric flow rate.

Since the permittee is using CEMS to meet the requirements of Part 75, they may use this CEMS to satisfy the requirements of Part 60.

The visible emissions checks provisions have been updated to reflect the current format and requirements.

D. Performance Testing

The permittee shall conduct RATA testing in accordance with 40 CFR Parts 60 and 75, as applicable.

E. Recordkeeping and Reporting

Provisions for all CEMS information required by 40 CFR Part 75, including a CEMS monitoring plan, downtime justifications and corrective actions taken have been incorporated into the permit.

F. Public Participation

Public participation is required for significant revisions per AQR 12.5.2.17 and shall be a 30-day notice on the department's website. To facilitate public outreach consistent with environmental justice requirements, DAQ shall publish the notice in the Las Vegas Review-Journal.

G. Increment Analysis

This action doesn't include pollution emissions for which an increment analysis is required. The following analysis was performed September 15, 2020, and is included for reference only.

Saguaro Power is a major source in Hydrographic Area 212 (the Las Vegas Valley). Permitted emission units include two turbine generators, two starter engines, two boilers, one cooling tower and other equipment. Since minor source baseline dates for NO_x (October 21, 1988) and SO₂ (June 29, 1979) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

DAQ modeled the source using AERMOD to track the increment consumption. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. U.S. Geological Survey National Elevation Dataset terrain data were used to calculate elevations. Table III-G-1 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table III-G-1: PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption (µg/m ³)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO ₂	3-hour	18.93 ¹	679100	3990700
SO ₂	24-hour	8.38 ¹	679300	3990900
SO ₂	Annual	1.11	679200	3990900
NO _x	Annual	7.07	679136	3990509

¹ Second High Concentration.

H. Attachments

See the following for a calculation of the values.

Table III-H-1: Change in Emissions (tons per year)

Pollutants	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	NH ₃	GHG
Existing Permit PTE	38.75	38.03	163.77	90.13	13.36	13.36	9.04	n/a	551,984
Revised PTE	31.79	31.07	158.45	90.13	3.10	12.84	9.00	45.01	544,830
Net Emission Change	-6.96	-6.96	-5.00	0.00	-10.26	-0.52	-0.04	n/a	-7,154

Table III-H-2: Source PTE (tons per year)

EU	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	NH ₃	GHG
A01 ¹	10.95	10.95	66.58	39.42	1.18	4.03	2.01	21.81	207,983
A02 ¹	10.95	10.95	66.58	39.42	1.18	4.03	2.01	21.81	207,983
A03	0.07	0.07	1.01	0.22	0.01	0.08	0.01	0.00	12
A04	0.07	0.07	1.01	0.22	0.01	0.08	0.01	0.00	12
A05 ⁴	6.66	6.66	13.94	0.86	0.57	4.47	4.47	0.00	101,433
A06 ⁵	1.29	1.29	9.33	9.99	0.15	0.15	0.49	0.00	27,407
A09a ⁶	0.60	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A09b ⁶	0.60	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A09c ⁶	0.60	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F05 ⁷	-	-	-	-	-	-	-	-	-
F05a ⁷	-	-	-	-	-	-	-	-	-
F06 ⁸	-	-	-	-	-	-	-	-	-
F06a ⁸	-	-	-	-	-	-	-	-	-
F11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.00
Total	31.79	31.07	158.45	90.13	3.10	12.84	9.00	45.01	544,830

¹ Revised annual emissions based on 8,760 hours burning natural gas (added).

² Current permit annual emissions based on 8,280 hours burning natural gas (removed).

³ Current permit annual emissions based on 480 hours burning diesel fuel (removed).

⁴ Emissions from Indeck/Volcano boiler (EU A05) after installation of the low-NO_x burners and CO oxidation catalyst. NO_x emissions are limited to 12 ppmvd @3% O₂, while CO emissions are limited to 1.2 ppmvd @3% O₂. With the exception of HAPs, the remaining emissions were based on manufacturer's emission factors. HAPs were calculated using AP-42 emission factors from Tale 1.4-3 and an assumed natural gas heating value of 1,020 BTU/scf.

⁵ Annual emissions based on 6,000 hours/rolling 12-months of natural gas combustion.

⁶ PM_{2.5} is assumed to be 100% of PM₁₀ for all combustion sources (AP-42 Chapters 1.4 and 3.3) and 60% of cooling tower PM₁₀ (California Emissions Inventory Development and Reporting System).

⁷ Annual emissions included with EU A01.

⁸ Annual emissions included with EU A02.

Table III-H-3: Source PTE (pounds per hour)

EU	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	NH ₃
A01 ¹	2.50	2.50	15.20	9.00	0.27	0.92	0.46	4.98
A02 ¹	2.50	2.50	15.20	9.00	0.27	0.92	0.46	4.98
A03 ³	1.14	1.14	16.12	3.47	0.01	1.31	0.02	0.00
A04 ³	1.14	1.14	16.12	3.47	0.01	1.31	0.02	0.00
A05 ³	1.52	1.52	3.18	0.20	0.13	1.02	1.02	0.00
A06 ⁴	0.43	0.43	3.11	3.33	0.05	0.05	0.16	0.00
A09a ³	0.41	0.25	0.00	0.00	0.00	0.00	0.00	0.00
A09b ³	0.41	0.25	0.00	0.00	0.00	0.00	0.00	0.00
A09c ³	0.41	0.25	0.00	0.00	0.00	0.00	0.00	0.00
F11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.32

¹ Emissions from the combustion of natural gas in the turbine and duct burners. PM₁₀ emission factor is manufacturer's guarantee of 2.5 lb/hr. NO_x emission factor is 10 ppmvd @15% O₂. CO emission factor is 10 ppmvd @15% O₂. SO₂ emission factor is 0.0006 lb/MMBtu from the footnotes of AP-42 Table 3.1-2a. VOC emission factor is from AP-42 Table 3.1-2a. NH₃ emission factor is manufacturer's guarantee of 4.98 lb/hr. HAP emission factors are from AP-42 Table 3.1-3.

² Emission factors from the combustion of diesel fuel oil in the turbine (removed).

³ See emission unit calculation worksheet.

⁴ Except for CO, SO₂, and HAP, emissions are based on manufacturer's emission factors. CO was determined by a performance test. While the actual factor is unavailable, Air Quality indicated in the 8/2009 Technical Support Document that there was available documentation which suggests that the permit limit may be slightly higher. SO₂ was calculated using the emission factor from AP-42 Table 1.4-2 and an assumed natural gas heating value of 1,020 BTU/scf. HAPs were calculated using the emission factors from AP-42 Table 1.4-3 and an assumed natural gas heating value of 1,020 BTU/scf.

Table III-H-4: Startup and Shutdown Emission Rates (pounds per hour)^{1,2}

EU	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	NH ₃ ³
A01 ⁴	2.50	2.50	65.00	9.00	0.27	0.94	0.46	2.04
A01 ⁵	17.00	17.00	104.00	9.00	21.64	0.17	0.54	2.04
A02 ⁴	2.50	2.50	65.00	9.00	0.27	0.94	0.46	2.04
A02 ⁵	17.00	17.00	104.00	9.00	21.64	0.17	0.54	2.04
A05	1.87	1.87	9.11	9.24	0.15	1.34	0.49	0

FOR REFERENCE ONLY

¹Startup and shutdown emission rates are to be used to assess compliance with annual emissions limits. Emission factors will be used when CEMS data is not available (Reference: 00393_20141006_TSD).

²Startup or shutdown have a duration of one hour each.

³For informational purposes only. All references to ammonia have been removed from the permit, as it is not regulated.

⁴Emissions from the combustion of natural gas in the turbine.

⁵Emissions from the combustion of distillate oil in the turbine.

Table III-H-5: Applicability Emissions (tpy)

EU	PM10	PM2.5	NOx	CO	SO2	VOC	HAP	NH3
A01 Total ^{1,2}	10.95	10.95	66.58	39.42	1.18	4.03	2.01	21.81
A02 Total ^{1,2}	10.95	10.95	66.58	39.42	1.18	4.03	2.01	21.81
A03	0.07	0.07	1.01	0.22	0.01	0.08	0.01	0.00
A04	0.07	0.07	1.01	0.22	0.01	0.08	0.01	0.00
A05 ³	6.66	6.66	13.94	0.86	0.57	4.47	4.47	0.00
A06 ⁴	1.88	1.88	13.62	14.59	0.23	0.22	0.72	0.00
A09a ⁵	0.60	0.36	0.00	0.00	0.00	0.00	0.00	0.00
A09b ⁵	0.60	0.36	0.00	0.00	0.00	0.00	0.00	0.00
A09c ⁵	0.60	0.36	0.00	0.00	0.00	0.00	0.00	0.00
F05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F05a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F06a	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F07	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
F08	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
F09	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
IA4	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
IA5	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00
IA6	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00
IA7	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00
IA8	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
IA9	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
IA10	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00
IA11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IA12	0.06	0.06	1.12	1.03	0.01	0.06	0.01	0.00
IA13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.39
Applicability	32.44	31.72	163.86	95.76	3.19	13.20	9.30	45.01

FOR REFERENCE ONLY

¹ Annual emissions based on worst-case scenario of 8,280 hours/rolling 12-months of natural gas combustion.

² Annual emissions based on worst-case scenario of 480 hours/rolling 12-months of diesel fuel combustion.

³ Emissions from Indeck/Volcano boiler (EU A05) after installation of the low-NOx burners and CO oxidation

⁴ Annual emissions based on 6,000 hours/rolling 12-months of natural gas combustion.

⁵ PM_{2.5} is assumed to be 100% of PM₁₀ for all combustion sources (AP-42 Chapters 1.4 and 3.3) and 60% of cooling tower PM₁₀ (California Emissions Inventory Development and Reporting System).