



**TECHNICAL REVIEW AND EVALUATION  
OF APPLICATION FOR  
AIR QUALITY PERMIT NO. 64101**

**Griffith Energy, LLC**

**I. INTRODUCTION**

This Class I (Title V) renewal permit is issued to Griffith Energy, LLC, the Permittee, for the continued operation of the Griffith Energy power plant located at 3375 West Navajo Drive, in Golden Valley, Arizona.

The facility was issued an initial Title V permit (Number 1000940) on August 31, 1999. The facility was subject to the Prevention of Significant Deterioration (PSD) program and a best available control technology (BACT) analysis was performed at the time of the initial permit. This permit renews and supersedes the facility's current Permit No. 53240.

**A. Company Information**

1. Facility Name: Griffith Energy, LLC
2. Facility Location: 3375 W Navajo Drive, Golden Valley, AZ 86413
3. Mailing Address: P.O. Box 3519, Kingman, AZ 86402

**B. Attainment Classification**

The facility is located in an area which is classified as attainment or unclassified for all criteria pollutants.

**II. PROCESS DESCRIPTION**

**A.** The Griffith Energy power plant is a 600 megawatt (MW) natural gas fired, combined cycle electric generating facility. The facility consists of two combustion turbine generators (CTGs) operated in conjunction with two heat recovery steam generating units (HRSGs) and one steam turbine. The facility also includes an auxiliary boiler, cooling towers, evaporative condenser and an emergency diesel fire pump.

**B.** NO<sub>x</sub> emissions from the facility are controlled by using low-NO<sub>x</sub> burners for the auxiliary boiler and selective catalytic reduction (SCR) units for the two CTG/HRSGs.

**C.** The Facility uses a Evaporative Water Spray System and a Turbo-Mister at its evaporation pond to maintain the minimum freeboard required by the facility's aquifer protection permit. The Evaporative Water Spray System generates particulate matter between 10 and 100 microns in diameter. This emission accounts for 12 tons per year of total facility wide PM emissions. The Turbo-Mister generates 0.46 tons per year of PM<sub>10</sub> and 0.35 tons per year of PM<sub>2.5</sub>.



### III. LEARNING SITES EVALUATION

NA

### IV. EMISSIONS

The facility burns natural gas in the CTGs, HRSGs and auxiliary boiler, and diesel in the emergency fire pump. Facility-wide Potential-to-emit from the facility is presented in Table 1. Maximum heat inputs and fuel consumption for the plant's major emission sources are presented in Table 2. The facility is a major source for criteria pollutants and an area source for federal hazardous air pollutants. Detailed emission calculations are available in the permit applicant.

**Table 1: Potential Emissions**

<b>Pollutant</b>	<b>Emissions (tons per year)</b>
<b>PM</b>	293
<b>PM<sub>10</sub></b>	293
<b>PM<sub>2.5</sub></b>	293
<b>NO<sub>x</sub></b>	268
<b>CO</b>	873
<b>SO<sub>2</sub></b>	50
<b>VOC</b>	311
<b>HAPs</b>	8.6

**Table 2: Maximum Heat Input and Fuel Consumption\***

EQUIPMENT	Heat Input MMBtu/hr	Heat Input MMBtu/yr	Natural Gas Usage MMscf/hr	Natural Gas Usage MMscf/yr
2 CTGs	3,318	2.91E+07	3.26	28,496
2 HRSGs with Supplemental Duct Firing	1,152	1.01E+07	1.12	9,894
Auxiliary Boiler	43.5	3.81E+05	0.043	374
Total	4,514	3.96E+07	4.42	38,764

\*Natural gas heating value assumed to be 1020 Btu/scf.

**Table 3: Facility-Wide Greenhouse Gas Emissions**

Emission Unit	Total Greenhouse Gas Emissions (CO <sub>2</sub> equivalent Metric Tons)
	CTG/HRSG1
CTG/HRSG2	1,039,131
Aux. Boiler	20,225
Diesel Fire Pump	14.38
<b>TOTAL</b>	<b>2,098,501</b>



## V. APPLICABLE REGULATIONS

Table 4 displays the applicable requirements for each permitted piece of equipment along with an explanation of why the requirement is applicable or not applicable

**Table 4: Verification of Applicable Regulations**

Unit	Control Device	Rule	Discussion
Combustion Turbine Generators	Low-NO <sub>x</sub> burners and SCR	40 CFR 60 Subpart GG	<p>The gas turbines were constructed after October 3, 1977, and are, therefore, subject to New Source Performance Standard (NSPS) Subpart GG.</p> <p>These stationary combustion turbines were constructed prior to February 18, 2005 and, hence, are not subject to NSPS Subpart KKKK.</p> <p>National Emission Standards for Hazardous Air Pollutants (NESHAP) Subpart YYYYY is applicable to stationary combustion turbines located at major sources of HAPs. Since the facility is not a major source of HAPs, this subpart is not applicable.</p>
Heat Recovery Steam Generators (HRSGs) supplementary firing duct burners	N/A	40 CFR 60 Subpart Da	<p>This subpart is applicable to electric utility steam generating units capable of combusting more than 250 MMBtu/hr heat input of fossil fuel, and commenced construction after September 18, 1978.</p>
Auxiliary Boiler	Natural gas Low NO <sub>x</sub> burner	40 CFR 60 Subpart Dc	<p>NSPS 40 CFR 60 Subpart Dc is applicable to boilers between 10 and 100 MMBtu/hour. As the boiler is natural gas-fired, only recordkeeping and reporting requirements under subpart Dc are applicable.</p> <p>NESHAP 40 CFR 63 Subpart JJJJJ requirements are not applicable to gas-fired boilers</p>



Unit	Control Device	Rule	Discussion
Cooling Tower and Evaporative Condenser	High Efficiency Drift Eliminator	A.A.C.R18-2-730	Cooling towers are regulated under the Standards of Performance for Unclassified Sources, A.A.C.R18-2-730.
Emergency Fire pump		A.A.C. R18-2-719 40 CFR 63 Subpart ZZZZ	A.A.C. R18-2-719 is applicable to existing stationary rotating machinery.  NSPS Subpart IIII is applicable to stationary engines manufactured after 2005. The engine was constructed prior to this date, and hence, is not subject to NSPS Subpart IIII.  NESHAP 40 CFR 63 Subpart ZZZZ is applicable to reciprocating internal combustion engines located at major and area sources of HAPs
Spray Evaporation Systems & Turbo-Mister	N/A	A.A.C. R18-2-702.B A.A.C. R18-2-702.C A.A.C. R18-2-730.D A.A.C. R18-2-730.G	The opacity standards from A.A.C R18-2-702 applicable to point source fugitive emissions.  The standards from A.A.C. R18-2-730 are applicable to unclassified sources.
Fugitive dust sources	Water Trucks Dust Suppressants	A.A.C. R18-2 Article 6 A.A.C. R18-2-702	These standards are applicable to all fugitive dust sources at the facility.
Abrasive Blasting	Wet blasting; Dust collecting equipment; Other approved methods	A.A.C. R-18-2-702 A.A.C. R-18-2-726	These standards are applicable to any abrasive blasting operation.
Spray Painting	Enclosures	A.A.C. R18-2-702 A.A.C. R-18-2-727	This standard is applicable to any spray painting operation.
Demolition/renovation operations	N/A	A.A.C. R18-2-1101.A.8	This standard is applicable to any asbestos related demolition or renovation operations.



Unit	Control Device	Rule	Discussion
Mobile sources	None	A.A.C. R18-2-801	These are applicable to off-road mobile sources, which either move while emitting air pollutants or are frequently moved during the course of their utilization.

## VI. PREVIOUS PERMIT CONDITIONS

Permit No. 53024 was issued on March 12, 2012, for the continued operation of this facility. Table 5 below illustrates if a section in Permit No. 53024 was revised, kept, or deleted.

**Table 5: Permit No. 64101**

Section No.	Determination			Comments
	Revised	Keep	Delete	
Att. A.	X			General Provisions - Revised to represent most recent template language.
Att. B				
Section I		X		The facility-wide requirements for an EPA Method 9 certified observer, and submittal of compliance certifications are retained.
Condition II.A.1 thru 3 and 4		X		The PSD emission standards for startup and shutdown for CTGs and recordkeeping
Conditions II.B.1 and 2		X		PSD limitation on fuel and recordkeeping
Condition II.C.1		X		The PSD particulate matter emission standards for CTGs are retained.
Condition II.C.2		X		Particulate matter testing requirement for CTGs is retained.
Condition II.D.1		X		The PSD and 40 CFR 60 Subpart GG NO <sub>x</sub> emission standards for CTGs.
Condition II.D.2		X		The NO <sub>x</sub> air pollution control requirement for CTGs.
Condition II.D.3		X		The monitoring, recordkeeping and reporting requirements for NO <sub>x</sub> emission under 40 CFR 60 Subpart GG.
Condition II.E		X		The CO emission standards and monitoring, reporting & recordkeeping requirements for CTGs are retained.
Condition II.F		X		The PSD and 40 CFR 60 Subpart GG SO <sub>2</sub> emission standards and monitoring, reporting & recordkeeping requirements.
Condition II.G		X		The VOC requirements for CGTs are retained.
Condition III.A		X		PSD Fuel limitation for Duct Burners for HRSGs.



Section No.	Determination			Comments
	Revised	Keep	Delete	
Condition III.B		X		40 CFR 60 Subpart Da Particulate Matter emission and Opacity standards including monitoring, reporting & recordkeeping requirements.
Condition III.C		X		40 CFR 60 Subpart Da NO <sub>x</sub> emission standards including compliance, monitoring, reporting & recordkeeping requirements.
Condition III.D		X		40 CFR 60 Subpart Da SO <sub>2</sub> emission standards and testing requirements.
Condition IV.A		X		Fuel Limitations for Auxiliary Boilers are retained.
Condition IV.B		X		The particulate matter and opacity requirements for auxiliary boiler are retained.
Condition IV.C		X		The PSD standards for NO <sub>x</sub> emission and all other requirements for NO <sub>x</sub> are retained.
Condition IV.D		X		The requirements for CO for auxiliary boiler are retained.
Condition IV.E		X		The requirements for SO <sub>2</sub> for auxiliary boiler are retained.
Condition IV.F		X		The requirements for VOCs for auxiliary boiler are retained.
Section V		X		Internal Combustion Engine requirements including NESHAP Subpart ZZZZ is retained.
Section VI		X		The requirements for cooling towers and evaporative condenser are retained.
Section VII		X		Turbo Mister requirements are retained and were under Section X of the Minor Mod LTF 62964.
Section VIII		X		Requirements for Evaporative Water Spray system (EWS). This section was under Section X of the Minor Mod LTF 56064.
Section IX	X			This Section for fugitive dust requirements has been revised. This section was previously under Section VII.
Section X		X		Mobile Source requirements are retained. This requirement was previously under Section VIII.
Section XI		X		This Section for Other Periodic Activities requirements are retained. This requirement was previously under Section IX.



## VIII. MONITORING, REPORTING AND RECORDKEEPING REQUIREMENTS

### A. Combustion Turbine Generators Units 1 and Units 2

#### 1. NO<sub>x</sub>

- a. The Permittee is required to monitor nitrogen oxide emissions using continuous emission monitoring system (CEMS).
- b. For the purpose of PSD emission limits, the Permittee is required to report any exceedance based on 3-hour average emissions.
- c. For the purpose of 40 CFR 60 Subpart GG emission limitations, the Permittee is required report any exceedance based on 4-hour rolling average NO<sub>x</sub> concentration.

#### 2. Carbon Monoxide

The Permittee is required to monitor CO emissions using CEMS.

#### 3. Fuel

The Permittee is required to maintain records of tariff agreement containing the sulfur content and lower heating value of natural gas.

### B. Duct Burner

40 CFR 60 Subpart Da is applicable to HRSGs with supplemental duct burners above 250 MMBtu per hour.

#### 1. Opacity

The Permittee is required to conduct initial and subsequent performance tests to demonstrate compliance with the opacity standards for duct burners using EPA Reference Method 9, or, alternately using EPA Reference Method 22 as provided in 40 CFR 60.49Da(a)(3).

#### 2. NO<sub>x</sub>

The Permittee is required to demonstrate compliance with NO<sub>x</sub> emission standard on a rolling 30-day average basis using NO<sub>x</sub> CEMS and as provided in 40 CFR 60.49Da(k)(2).

### C. Auxiliary Boiler

#### 1. Opacity



The Permittee is required to conduct a quarterly survey of visible emissions from the stack of auxiliary boiler, when in operation, using EPA Reference Method 9. The Permittee must keep records of the observations, and corrective action taken, if any.

2. Fuel

The Permittee is required to maintain records of tariff agreement containing the sulfur content and lower heating value of natural gas. The Permittee is also required to maintain a record of monthly natural delivered to the auxiliary boiler.

**D.** Fire Pump engine

1. The Permittee is required to conduct a monthly survey of visible emissions from the stack of the fire pump engine, when in operation.
2. The Permittee is required to record the hours of operation of the engine recorded through the non-resettable hour meter. The Permittee must document the hours for emergency and non-emergency operation.

**E.** Cooling Towers/Evaporative Condenser

1. The Permittee is required to conduct annual drift eliminator inspections and monitor monthly the delta T (difference between inflow temperature and outflow temperature) of the cooling tower during normal operations. If delta T is less than or equal to 6 degrees, then a drift eliminator inspection must be scheduled as soon as practicable.
2. The Permittee is required to maintain records of the monthly analysis of the total dissolved solids (TDS) for the circulating cooling water for each cooling tower and the evaporative condenser.
3. The Permittee is required to perform calculations for particulate matter emissions every month for main cooling tower, chilling cooling tower and the evaporative condenser. The emission calculations must be based on the average cooling water circulation rate for the month, the TDS analysis for that month, and drift rates of 0.0005, 0.003 and 0.002 for the main cooling tower, chilling cooling tower and evaporative condenser respectively. The Permittee must maintain records of these calculations.

**F.** Turbo-Mister

1. The Permittee is required to conduct a quarterly survey of visible emissions emanating from the Turbo-Mister when in operation. If opacity appears to exceed, a certified EPA Method 9 observer is required to perform, if practicable, an observation and keep records of the results of the observation.
2. If opacity reading is in excess of 20%, Permittee is required to report to ADEQ and keep record of corrective action performed.



**G. Evaporative Water Spray Systems (EWS)**

1. The Permittee is required to perform a quarterly inspection of each spray nozzle to ensure their proper functioning.
2. The Permittee is required to keep records of inspection dates, inspection result and any corrective action performed.

**H. Fugitive Dust**

1. The Permittee is required to keep record of the dates and types of dust control measures employed.
2. The Permittee is required to show compliance with the opacity standards by having a Method 9 certified observer perform monthly survey of visible emission from fugitive dust sources. The observer is required to conduct a 6-minute Method 9 observation if the results of the initial survey appear on an instantaneous basis to exceed the applicable standard.
3. The Permittee is required to keep records of the name of the observer, the time, date, and location of the observation and the results of all surveys and observations.
4. The Permittee is required to keep records of any corrective action taken to lower the opacity of any emission point and any excess emission reports.

**I. Periodic Activities**

1. The Permittee is required to record the date, duration and pollution control measures of any abrasive blasting project.
2. The Permittee is required to record the date, duration, and quantity of paint used, any applicable MSDS, and pollution control measures of any spray painting project.
3. The Permittee is required to maintain records of all asbestos related demolition or renovation projects. The required records include the "NESHAP Notification for Renovation and Demolition Activities" form and all supporting documents.

**J. Mobile Sources**

The Permittee is required to keep records of all emission related maintenance performed on the mobile sources.

**IX. TESTING REQUIREMENTS**

**A. Combustion Turbine Generators Unit 1 and Unit 2**

1. The Permittee is required to conduct a performance test in the first year of the permit term to determine particulate matter emissions using EPA Reference Method 5 or equivalent.



2. The Permittee is required to conduct a performance test in the first year of the permit term to determine the sulfur dioxide emissions using EPA Reference Method 19.
3. The Permittee is required to conduct a performance test in the first year of the permit term to determine the VOC emissions using EPA Reference Method 25A to test for total gaseous organic compounds and EPA Reference Method 18 to measure both the methane and ethane emissions.

**B. Duct Burner**

The performance tests conducted to demonstrate compliance with the PSD emission limits for particulate matter and sulfur dioxide for the CTGs must be utilized for determining the compliance with particulate matter and sulfur dioxide emission standards for duct burners under 40 CFR 60 Subpart Da.

**C. Auxiliary Boiler**

1. The Permittee is required to conduct a performance test in the first year of the permit term to determine the particulate matter in accordance with EPA Reference Method 5.
2. The Permittee is required to conduct a performance test in the first year of permit term to determine  $\text{NO}_x$  in accordance with EPA Reference Method 7E.
3. The Permittee is required to conduct a performance test in the first year of permit term to determine CO in accordance with EPA Reference Method 10.
4. The Permittee is required to conduct a performance test in the first year of permit term to determine the sulfur dioxide concentration using EPA Reference Method 6.
5. The Permittee is required to conduct a performance test in the first year of permit term determine the VOC concentration using EPA Reference Method 25A to test for total gaseous organic compounds.

**X. COMPLIANCE HISTORY**

There have been 56 report reviews and 5 routine facility inspections associated with this facility since 2012. The report reviews includes quarterly monitoring reports, semiannual compliance reports, excess emission report, performance test reports. No air quality cases or violations have been developed for this facility as a result of the inspections.

**XI. COMPLIANCE ASSURANCE MONITORING (CAM) (40 CFR 64)**

The CAM rule applies to "pollutant-specific emission units" (PSEU) at a major Title V source if the unit meets all of the following criteria:

1. The unit is subject to an emission limit or standard for the applicable regulated air pollutant;
2. The unit uses a control device to achieve compliance with the emission limit or standard; and



3. The unit has "potential pre-control device emissions" of the applicable regulated air pollutant equal to or greater than 100% of the amount (tons/year) required for a source to be classified as a major source. "Potential pre-control device emissions" means potential to emit (PTE, as defined in Title V) except emissions reductions achieved by the applicable control device are not taken into account.

NO<sub>x</sub>, CO, SO<sub>2</sub>, PM, and VOC potential to emit for the CTGS is above 100 ton per year. There are no controls installed for controlling CO, PM, VOC, and SO<sub>2</sub>. Therefore CAM does not apply for these pollutants. The facility uses add-on-control for NO<sub>x</sub> emissions. The permit requires the Permittee to operate a continuous monitoring system (CEMS) for measuring NO<sub>x</sub> emissions to demonstrate compliance with the NO<sub>x</sub> emission limits. Since the facility uses CEMS to demonstrate compliance with an applicable requirement, the facility is exempt from CAM requirements as per 40 CFR 64.2(b)(vi).

## XII. LIST OF ABBREVIATIONS

A.A.C.	Arizona Administrative Code
ADEQ	Arizona Department of Environmental Quality
BACT	Best Available Control Technology
Btu/ft <sup>3</sup>	British Thermal Units per Cubic Foot
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emission Monitoring System
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO <sub>2</sub>	Carbon Dioxide
CTG	Combustion Turbine Generator
HAP	Hazardous Air Pollutant
hp	Horsepower
hr	Hour
HRSG	Heat Recovery Steam Generator
IC	Internal Combustion
lb	Pound
m	Meter
MMBtu	Million British Thermal Units
MMscf	Million Standard Cubic feet
MW	Megawatt
NESHAPS	National Emission standards for Hazardous Air Pollutants
NO <sub>x</sub>	Nitrogen Oxide
NO <sub>2</sub>	Nitrogen Dioxide
NSPS	New Source Performance Standards
PM	Particulate Matter
PM <sub>10</sub>	Particulate Matter Nominally less than 10 Micrometers
PM <sub>2.5</sub>	Particulate Matter Nominally less than 2.5 Micrometers
PSD	Prevention of Significant Deterioration
PTE	Potential-to-Emit
scf	Standard Cubic feet
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SO <sub>2</sub>	Sulfur Dioxide
TDS	Total Dissolved Solids
EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compound



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