

**TECHNICAL REVIEW AND EVALUATION OF
APPLICATION FOR AIR QUALITY PERMIT #31910**

I. INTRODUCTION

This Class I (Title V) Permit Renewal is for the operation of the Griffith Energy Project (Griffith Energy), located off Interstate-40 south of Kingman, Arizona. The Project is owned by Griffith Energy, LLC.

A. Company Information

Facility Name: Griffith Energy, LLC
 Mailing Address: P.O. Box 3519 Kingman, AZ 86402
 Facility Address: SW 1/4 of Section 6, Northwest of Griffith Interchange, Highway 40, Mohave County, Arizona

B. Attainment Classification

The source is in an attainment area for all criteria pollutants: PM10, NO_x, SO₂, CO, Pb, and ozone.

II. FACILITY DESCRIPTION

Please refer to the Permit Application

III. EMISSIONS

The Griffith Energy facility will burn only natural gas, at a maximum rate of approximately 44,000 million standard cubic feet per year (MMscf/year). Maximum electric power production rates are presented in Table 1. Maximum heat inputs and fuel consumption for the plant's emission sources are presented in Table 2. Emissions provided by the applicant are for 24-hour per day and 365 days per year of operating time for all equipment, and are presented in Table 3.

Table 1: Maximum Electric Power Production Rates

Emission ID/Unit	Hours/year	MW	MW-hr/yr
Combustion Turbine Generator Unit 1	8760	183	1,576,800
Combustion Turbine Generator Unit 2	8760	183	1,576,800
Steam Turbine Generator	8760	300	2,540,400
Total		666	5,694,000

Note: The information in this table was provided by Griffith in their application for a Class I Permit. The process rates and operating hours listed are for informational purposes only. In addition, this information should not be construed as establishing enforceable limitations of any form on Griffith operations.

Table 2: Maximum Heat Input and Fuel Consumption

	Heat Input (HHV) in MMBtu/yr	Heat Input (HHV) in MMBtu/hr	Natural Gas Usage* in MMscf/yr	Natural Gas Usage* in MMscf/hr
2 CTGs	3.20E+07	3,658	32,044	3.658
2 HRSGs with Supplemental Duct Firing	1.14E+07	1,300	11,388	1.30
Auxiliary Boiler	3.31E+5	37.8	331.1	0.0378
Total	4.37E+07	4,996	4.37E+04	4.996

*Natural gas heating value assumed to be 1000 Btu/scf.

Table 3: Facility-Wide Potential to Emit (PTE)

Pollutant	Tons Per Year
PM	280.59
SO ₂	50.2
NO _x	265.84
VOCS	310.29
CO	871.61
Formaldehyde	7.2
H ₂ SO ₄	.06
Ammonia	117

V. APPLICABLE REGULATIONS

The Permittee has identified the applicable regulations that apply to each unit in its permit application. Table 4 summarizes the findings of the Department with respect to those regulations that are applicable to each unit and describes the control equipment used for each emission unit. The use of natural gas and good combustion techniques is assumed.

Table 4: Applicable Regulations Verification

Unit ID	Start-up date	Control Equipment	Applicable Regulations	Verification
001 and 002- Combustion Turbine Generators/HRSGs from west and east stacks, respectively	January 15, 2002	Low NOx burners and SCR	40 CFR 60, Subpart GG 40 CFR 72 40 CFR 73 40 CFR 75 40 CFR 60 Subpart Da	Gas Turbine ≥ 10 MMBtu/hr and burning natural gas. Electric Utility Steam Generating Units >250 MMBtu/hr and burning natural gas.
Duct Burners (2) each 40 MW	January 15, 2005	Natural Gas	40 CFR, Subpart Dc Arizona SIP R9-3-503.C.1.a.i Arizona SIP R9-3-503.C.4.a	The Unit commenced construction after June 9, 1989 and is less than 100 MMBtu/hr heat capacity but greater than 10 MM Btu/hr. Because the unit is fired by natural gas only monitoring and record-keeping requirements apply. Arizona SIP R9-3-503 (Standards of Performance for Fossil Fuel Fired Steam and other Fuel Burning Equipment) applies to existing sources and other units which are less than 73 megawatts.
003 - Auxiliary Boiler	January 15, 2002	Natural gas Low NOx burner	40 CFR 60 Subpart Dc	Small Industrial- Commercial- Institutional Steam Generating Unit ≥ 10 and <100 MMBtu/hr, natural gas fuel
Cooling Tower	January 15, 2002	High Efficiency Drift Eliminator	A.A.C.R18-2-730D A.A.C.R18-2-730.G	Cooling towers are regulated under the Standards of Performance for Unclassified Sources
Non-Point Sources	January 15, 2002		A.A.C.R18-612 A.A.C.R18-2-604.A A.A.C.R18-2-605.A	Non-Points Sources are regulated under the Evaluation of Non-Point Sources Emissions

VI. PREVIOUS PERMITS

A. List of the Permits

PERMIT NUMBER	DATE PERMIT ISSUED	APPLICATION BASIS	DESCRIPTION
30139	12/5/2003	MINOR REVISION	Additional Requirements for storage tanks, update equipment list and add insignificant items.
1000940	08/31/1999	CLASS I PERMIT	TITLE V permit for facility

B. Previous Permit Conditions

1. Permit #1000940

OPERATING PERMIT #1000940	DELETE	KEEP	REVISE	STREAMLINED	REMARKS
Attachment "A"			√		Attachment "A" has been updated
Attachment "B"					
I.A.1			√		Definition of startup and shutdown has been modified From 60 percent load to a receipt of a Mode 6Q signal. See Permit Condition II.A of Attachment B
I.A.2		√			Opacity Standards are unchanged and renumbered to II.B of Attachment B
I.A.3		√			Particulate Matter standards are unchanged and renumbered to II.B of Attachment B
I.A.4		√			Sulfur Dioxide standards are unchanged and renumbered to II.E of Attachment B
I.A.5		√			Nitrogen Oxide standards are unchanged and renumbered. to II.C of Attachment B
I.A.6		√			Carbon Monoxide standards are unchanged and renumbered to II.D of Attachment B
I.A.7		√			Volatile Organic Compounds standards are unchanged and renumbered to II.F of Attachment B
I.A.8			√		Fuel standards have been changed to pipeline quality natural gas containing no more than .5 grains or less of total per sulfur/100 dscf and 70% methane by volume or have a gross calorific value between 950 and 1100 BTU per standard cubic feet. Renumbered to II.G of Attachment B
I.B.1			√		Definition of startup and shutdown has

OPERATING PERMIT #1000940	DELETE	KEEP	REVISE	STREAMLINED	REMARKS
					been modified from 60 percent load to a receipt of a Mode 6Q signal. Conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit 2 with supplemental firing and are in condition II.A of Attachment B
I.B.2		√			Opacity Standards are unchanged and the Conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit 2 with supplemental firing and are in condition II.B of Attachment B
I.B.3		√			Particulate Matter standards are unchanged. and the Conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit 2 with supplemental firing and are in condition II.B of Attachment B
I.B.4		√			Sulfur Dioxide standard is unchanged and the Conditions for the CTGS Unit 1&2 without supplemental duct firing has been combined with CTGS Unit 1 and Unit 2 with supplemental firing and is in condition II.E. of Attachment B
I.B.5	√				Nitrogen Oxide standards are unchanged and the conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit 2 with supplemental firing are in condition II.C. of Attachment B
I.B.6		√			Carbon Monoxide standards are unchanged and the Conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit2 with supplemental firing and are in condition renumbered to II.D of Attachment B
I.B.7		√			Volatile Organic Compounds standards are unchanged and the Conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit 2 with supplemental firing and are renumbered in section II.F of Attachment B
I.B.8		√			Fuel standards have been to pipeline quality natural gas containing no more than .5 grains or less of total per sulfur/100 dscf and 70% methane by volume or have a gross calorific value between 950 and 1100 BTU per standard cubic feet and the Conditions for the CTGS Unit 1&2 without supplemental duct firing have been combined with CTGS Unit 1 and Unit 2 with supplemental firing and are in

OPERATING PERMIT #1000940	DELETE	KEEP	REVISE	STREAMLINED	REMARKS
					condition renumbered in sections II.G of Attachment B
I.C.1		√			Opacity standards are unchanged and are renumbered in section III.A of Attachment B
I.C.2		√			Particulate Matter standards are unchanged and are renumbered in section III.A of Attachment B
I.C.3		√			Sulfur Dioxide standards are unchanged and are renumbered in section III.D of Attachment B
I.C.4		√			Nitrogen Oxide standards are unchanged and are renumbered in section III.D of Attachment B
I.C.5		√			Carbon Monoxide standards are unchanged and are renumbered in section III.C of Attachment B
I.C.6					Volatile Organic Compounds standards are unchanged and are renumbered in section III.E of Attachment B
I.C.7			√		Fuel Standards are changed from .75 grains of sulfur per 100 dscf to .5 grains of sulfur per 100 dscf and 70% methane by volume or have a gross calorific value between 950 and 1000 BTU per scf for pipeline natural gas and are renumbered in section III.F of Attachment B
I.D.1-I.D.4		√			Opacity Standard is unchanged and is renumbered in section IV. of Attachment B
I.E.1-I.E.4		√			Opacity Standard is unchanged and is renumbered in section IV. Attachment B
I.F		√			Non-point sources standards are unchanged and are renumbered in section VI. Attachment B
I.G		√			Other Periodic standards are unchanged and are renumbered in section VII. Attachment B
I.H		√			Sulfuric Acid and Sodium Hydroxide Tanks standard remain unchanged and are renumber in section V of Attachment B
II.A		√			Air pollution equipment for CTG/HRSG units are unchanged and are renumbered in section II.D.2 of Attachment B
II.B		√			Air pollution equipment for Auxiliary Boiler are unchanged and are renumbered in section III.A.3 of Attachment B
II.C		√			Air pollution equipment for the Cooling Towers are unchanged and are renumbered in section IV.3 of

OPERATING PERMIT #1000940	DELETE	KEEP	REVISE	STREAMLINED	REMARKS
					Attachment B
III.A-III.B		√			Standards are unchanged and are renumbered in section I.A and A.B respectively of Attachment B
III.C.1		√			Standards are unchanged and are renumbered in section II.C.3 of Attachment B
III.C.2		√			Standards are unchanged and are renumbered in section II.D of Attachment B
III.C.3					Standards are unchanged and are renumbered in section II.E of Attachment B
III.C.4			√		Performance test is still required, but the initial performance test has been removed since the facility is operating.
III.C.5			√		Records shall be kept on a monthly basis, twelve month monthly total for the startup and shutdown for each unit and standard is in section II.A of Attachment B
III.C.6a.1					Standards are unchanged and are renumbered in section II.E of Attachment B
III.C.6a.2					Standards are unchanged and are renumbered in section II.B.1.D of Attachment B
III.C.6a.3					Standards are unchanged and are renumbered in section II.E.2. of Attachment B
III.C.6a.4		√			Standard unchanged located In D.2.c
III.D			√		Sections D.2-D.4 are deleted, the source has already started operation. Sections D.1, D.5, and D.6 remain unchanged and are renumbered in section III.A.4 of Attachment B
III.E			√		Monitoring for nonpoint source is located in section VI.2.d
III.F			√		Permittee shall log the date, duration of the project and controls employed See section VII of Attachment B
III.G		√			Standards are unchanged and renumbered in section VII of Attachment B
IV.A	√				The source is already in operation, so no testing is required.
IV.B.1-IV.B.6		√			performance tests that are required are located in each pollutants section in Attachment B
IV.C.1-IV.C.2		√			performance tests are required and have been combined in the CTG/HRSGS performance test section for each pollutant in Attachment B
IV.D		√			performance tests that are required are located in each pollutants section in Attachment B
V	√				Deleted: Covered under Application Requirements in the technical support

OPERATING PERMIT #1000940	DELETE	KEEP	REVISE	STREAMLINED	REMARKS
					document.
VI	√				Deleted: Facility has been constructed
Attachment "C"	√				Deleted: Application Requirements are located in the technical support document.
Attachment "D"			√		Modified per minor revision # 30139.
Attachment "E"	√				Deleted from the permit and added to the TSD.
Attachment "F"		√			No changes.

VII. PERIODIC MONITORING

A. Combustion Turbine Generators Units 1 and Units 2- Heat Recovery Steam Generators Unit 1 and Unit 2 in Combined Cycle Operation With and Without Supplemental Duct Firing.

Particulate Matter and Opacity shall be monitored by performing a visible emissions survey on a monthly basis, when the units are operating, to determine opacity using EPA Reference Method 9. Records will be kept identifying the observer, date of observation, and the results of the observation.

Nitrogen Oxide and Carbon Monoxide shall be monitored by use of a CEMS.

B. Auxiliary Boiler and Duct Burner

The auxiliary boiler is not subject to PM and NO_x limits from Arizona SIP 9-3-503 because it's only used to pre-heat the HSRG unit drums and therefore doesn't produce power. The NSPS standards of 40 CFR 60 Subpart Dc apply to this duct burner, because the heat rate of 40 MMBtu/hr is greater than 10 MMBtu/hr but less than 100 MMBtu/hr, and the burner was installed after June 9, 1989. Since the duct burner burns only natural gas, the only applicable requirement from 40 CFR 60 Subpart Dc is 40 CFR 60.48.c(g) which requires them to keep records of the amounts of the natural gas combusted.

Each duct burner is subject to PM and NO_x limits from Arizona SIP R9-3-503 because they are fuel burning equipment and each burner is rated at less than 73 megawatt.

For the auxiliary boiler, Griffith Energy shall monitor and maintain records of daily fuel usage, report all six-minute periods in which the opacity or any plume exceeds ten (10) opacity, and maintain vendor copy of FERC agreement of the sulfur content and lower heating value of the pipeline natural gas. Also, Griffith is required to maintain records of daily fuel consumption. This accomplished by maintaining a copy of the monthly natural gas bill for the auxiliary boiler.

Particulate Matter and Opacity shall be monitored by performing a visible emissions survey on a quarterly basis, when the unit is operating, to determine opacity using EPA Reference Method 9. Records will be kept identifying the observer, date of observation, and the results of the observation.

C. Cooling Towers

Griffith shall conduct annual drift eliminator inspections and will 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 will be scheduled as soon as practicable.

VIII. TESTING REQUIREMENTS

A. Combustion Turbine Generators Unit 1 and Unit 2 –Heat Recovery Steam Generators Unit 1 and Unit 2 in Combined Cycle Operations With and Without Supplemental Duct Firing

1. Griffith Energy is required to conduct a performance test in the first year of the permit term to determine particulate matter concentration using EPA Reference Method 5 or equivalent.
2. Griffith Energy is required to conduct a performance test in the first year of the permit term to determine the sulfur dioxide concentration using EPA Reference Method 19 or equivalent.
3. Griffith Energy is required to conduct a performance test in the first year of the permit term to determine the VOC concentration using EPA Reference Method 25A to test for total gaseous organic concentration and EPA Reference Method 18 to measure both the methane and ethane concentration.

B. Auxiliary Boiler

1. Griffith Energy 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. Griffith Energy is required to conduct a performance test in the first year of permit term to determine NOx in accordance with EPA Reference Method 7A.
3. Griffith Energy 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. Griffith Energy is required conduct a performance test in the first year of permit term to determine the sulfur dioxide concentration using EPA Reference Method 6.
5. Griffith Energy 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 concentration.

C. Cooling Towers

Griffith Energy is not required to conduct a performance test since the potential to emit from the main and chiller cooling towers are well below the emission limit.

Calculations for potential to emit from the main cooling tower assuming 8760 hr/yr operating hours:

$$PM_{10} = \text{annual recirculation rate} * \text{TDS} * PM_{10} \text{ fraction} * \text{drift eliminator efficiency}$$

$$PM_{10} = 3.2E10 * (3.785L/gal) * (3859 \text{ mg/L}) * (1g/1000mg) * (1lb/453.6g) * (1ton/2000lbs) * (.315) * (.00003)$$

$$PM_{10} = 4.88 \text{ TPY}$$

$$PM_{10} = 1.14 \text{ lbs/hr}$$

Calculations for potential to emit from the chiller cooling tower assuming 8760 hr/yr operating hours:

$$PM_{10} = \text{annual recirculation rate} * \text{TDS} * PM_{10} \text{ fraction} * \text{drift eliminator efficiency}$$

$$PM_{10} = 4.5E9 * (3.785L/gal) * (3859 \text{ mg/L}) * (1g/1000mg) * (1lb/453.6g) * (1ton/2000lbs) * (.315) * (.00003)$$

$$PM_{10} = .68 \text{ TPY}$$

$$PM_{10} = .16 \text{ lbs/hr}$$

In conclusion the emission limit of the main and chiller cooling towers are 5.9 lbs/hr and 1.4 lbs/hr respectively and the potential to emit are 1.14 lbs/hr and .16 lbs/hr respectively. Comparing the potential to emit to the allowable emission limits shows that the potential to emit are considerably less than the allowable emission limits, and therefore, testing is not required to track compliance.

X. INSIGNIFICANT ACTIVITIES

The activities identified in Table 5 have been deemed insignificant.

Table 5: Insignificant Activities

Activity No.	Source Description	Comments
1	Building HVAC Exhaust Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
2	Turbine Compartment Ventilation Exhaust Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
3	Sanitary Sewer Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.

Activity No.	Source Description	Comments
4	Compressed Air Systems	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
5	Turbine Lube Oil Vapor Extractors and Lube Oil Mist Eliminator Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
6	Steam Drum Safety Relief Valve Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
7	Building Air Conditioning Units	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
8	Emergency Diesel Fire Pump Exhaust Stack	Insignificant pursuant to Arizona Rule R18-2-101.57.h.
9	Emergency Diesel Fire Pump Fuel Storage Tank	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
10	Sulfuric Acid Storage Tank Vents	Subject to A.A.C. R18-2-730.F.
11	Various Steam Release Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
12	Welding Equipment	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
13	Lab Hood Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.i.
14	Water Wash System Storage Tank Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
15	Neutralization Basin	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
16	Portable Light Tower	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
17	55 Gallon Drummed Oil Venting Minimal Entrained Ammonia Quantities	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
18	Fuel Purge Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
19	Oil/ Water Separator Waste Oil Collection Tank Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
20	Sodium Hydroxide Tank	Subject to A.A.C. R18-2-730.F.
21	Condenser Vacuum Pump Vents	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
22	Vacuum Truck for Outage Cleanup	Insignificant pursuant to Arizona Rule R18-2-101.57.j.
23	Maintenance Shops Part Cleaner	Insignificant pursuant to Arizona Rule R18-2-101.57.j.

XI. OTHER PERIODIC ACTIVITIES

Condition VII.B does not apply to spot painting and aerosol cans, but applies to all other spray coating processes.

XII. COMPLIANCE ASSURANCE MONITORING (CAM)(40 CFR 64)

CAM applies only to emission units with pre-control potential to emit above 100 ton per year that are equipped with controls and have an emission limit. This facility has NO_x, CO, SO₂, PM, and VOC potential to emit above 100 ton per year. There are no controls installed for controlling CO, PM, VOC, and SO₂. Therefore CAM does not apply for these pollutants.

The Permittee uses add-on-control for NO_x emissions. The Title V permit requires the Permittee to operate a continuous monitoring system (CEMS) for measuring NO_x emissions to demonstrate compliance with the NO_x emission limits. Since the facility uses CEMS to show compliance with an applicable requirement, in accordance with the exemption specified in 40 CFR 64.2(b)(vi).