TECHNICAL REVIEW DOCUMENT
for
OPERATING PERMIT 95OPYU060
to be issued to:

Williams Natural Gas Company
Yuma Station
Yuma County
Source ID 1250017

Prepared on January 9, 1996
Revised April 24, 1997
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I. Purpose

This document will establish the basis for decisions made regarding the Applicable Requirements, Emission Factors, Monitoring Plan and Compliance Status of Emission Units covered within the Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA and during Public Comment. Information in this report is primarily from the application received on March 1, 1995 and additional information received on April 24, 1995. In addition, a site visit was conducted on August 15, 1995 to confirm the information in the application.

II. Source Description

This source is classified as a natural gas transmission facility defined under Standard Industrial Classification 4922. Gas is compressed to specification for transmission to sales pipelines using a single internal combustion engine powering four (4) compressor units. The only other activity on site is an emergency shutdown device (ESD), used to release natural gas to atmosphere in an emergency, and fugitive VOC emissions.

The facility is located just outside of the rural town of Yuma in Yuma County, Colorado. The area is designated as attainment for all criteria pollutants. Kansas is designated as an affected state located within a 50 mile radius of the facility. There are no Federal Class I areas within 100 kilometers of the facility. This source is minor with respect to Prevention of Significant Deterioration (PSD) requirements where PSD is triggered at 250 TPY of an attainment criteria pollutant. Facility wide emissions as follows:

Pollutant	Potential To Emit (TPY)	1994 Actual Emissions (TPY)
NOx	239.9	172
CO	26.1	19
VOC	13.0	6
SO_2	2.2	0.04
PM_{10}	4.2	3.0

Potential emissions are based upon 8760 hours/year of operation at maximum capacity. Actual emissions of NOx, CO, SO_2, and PM_{10} are based upon the last Air Pollution Emission Notices (APENs) received by the Division. VOC values are based upon emissions from the combustion of natural gas and the ESD device only and do not include fugitive VOC (see explanation below). Updated APENs were received on 4/24/95 giving 1994 Actual values. This facility is required to provide an updated APEN in the event that emissions of any of the above air pollutants increase 5% or 50 tons per year, whichever is less, above the level reported on the last APEN submitted to the APCD. Under the guidelines of EPA's Whitepaper for streamlining the operating permit process, actual emissions for the last data year were not required during the application process. Therefore, the Division assumes that emissions from this facility have remained the same or decreased since the last APEN submittal based upon the compliance certification in the operating permit application.

III. Emission Sources

The following sources are specifically regulated under the terms and conditions of the proposed Operating Permit (Permit) for this site:

Unit S1 - **Cooper model GMVH-12M, S/N: 48667, 2 cycle turbocharged, lean burn, internal combustion engine rated at 2700 maximum horsepower and 18.63 mmBtu/hr maximum designed fuel rate.**

Discussion:

1. Applicable Requirements -The unit received Initial Approval on September 24, 1979 under the ownership of Cities Service Gas Co for Colorado Construction

Permit 12YU378. Final Approval was granted on August 24, 1981. The permit was transferred to Williams Natural Gas Company on December 1, 1992. An inspection on 06/16/81 states that model 6829-T was inspected, however, this is not the same model as was permitted. Given the consistency of the data throughout the permit process and the enormous difficulty in swapping out the engine (the building is basically built around the engine), it is unlikely that a separate engine was actually out there. However, because of the confusion, the permit the permit was re-classified as Initial Approval on February 11, 1994. A modification to the Initial Approval was issued on September 10, 1996 along with increasing emissions of Oxides of Nitrogen (NOx), Volatile Organic Compounds (VOC), Carbon Monoxide (CO), and adding Sulfur Dioxide ($SO_{2)}$ and Particulate Matter under 10 microns (PM_{10}). An inspection was performed on August 15, 1995 which confirmed all of the conditions under 12YU378 except for the required emission test for NOx and CO. The permit was moved to Final Approval on September 10, 1996 based upon the site inspection and the internal guidance memorandum of March 14, 1996 (attached). The permit was then incorporated directly into the operating permit without issuance of an actual Final Approval Permit.

The following terms and conditions of 12YU378 have been incorporated into the Proposed Operating Permit as applicable requirements: Annual and hourly emission limitations for NOx, CO, VOC, and fuel consumption; and 20% Opacity limitation. While the guidance memo of 03/14/96 allows for the removal of the one-time stack test requirement for NOx and CO, specific engine monitoring guidelines for this situation suggest a one time compliance stack test for NOx. This issue is discussed in more detail under Monitoring, below. PM10 and SO2 were not included in the operating permit as emission of these pollutants were below deminimis levels.

The Construction Permit also required the unit to be equipped with a modified combustion system capable of reducing NOx by at least 50% and VOC by at least 40%. The Division has determined that these conditions are not enforceable as a practical matter and were not included in the permit. The exact combustion efficiency is not relevant as the facility will be required to continually demonstrate compliance with both short and long term emission limits.

The re-issuance of the initial approval to WNG included fugitive VOC emission limitations related to the compressor engines. These emissions were estimated based upon typical compressor station values. The operating permit application provided specific data which was used to calculate fugitive VOC emissions. The attached engineering worksheet provides these calculations. Because it was found

that potential uncontrolled fugitive VOC emissions were below Regulation No. 3 deminimis levels, no fugitive VOC limitations were included in the operating permit. VOC emissions are still present as emitted from the ESD discussed under Unit S2.

2. Emission Factors - Emissions from this engine are produced during the combustion process and are dependent upon the fuel ratio adjustment and specific properties of the natural gas being burned. The main pollutants of concern are NOx, CO, and VOC. Negligible amounts of PM and SO_2 are emitted from incomplete combustion and sulfur containing fractions. Small quantities of Hazardous Air Pollutants (HAPs) are also emitted when combustion is incomplete. The emission factors are based on manufacturer's values.

Pollutant	**Original Emission Factor (g/bhp-hr)**	**Converted Fuel-Based Emission Factor (lbs/mmBtu)**
NOx	9.14	2.92
CO	1.0	0.32
VOC	0.5	0.16

As discussed in the attached engineering worksheet titled EMISSION FACTOR CONVERSION, the NOx emission factor had earlier been inadvertently rounded up to 9.2 g/hp-hr. The correct emission factor has been used here. Additionally, the operating permit application included estimated fugitive VOC emissions in determining the VOC emission factor (1.2 g/hp-hr). However, as discussed above, fugitive VOC emissions are negligible and the manufacturer emission factor of 0.5 g/hp-hr was used.

The Division determined that the use of g/hp-hr emission factors did not adequately take into account engine performance. Additionally, since there is currently no simple way to measure field horsepower, it was determined that the use of fuel-based emission factors would be more representative of engine performance and actual emissions. Emissions would then be dependent upon the amount of fuel burned and the heat content of that fuel. The emission factors were converted using the attached engineering worksheet titled EMISSION FACTOR CONVERSION and are also shown in the table above.

3. Monitoring Plan - Conditions 1.1 to 1.7 of the Proposed Operating Permit list the Monitoring and Recordkeeping provisions necessary to verify compliance with applicable requirements for this engine. Specific monitoring guidance for Internal Combustion Engines in Attainment areas has been developed by the Division as shown on the three attached tables (for NOx, CO, and VOC) titled "Compliance/Scenario Summary - Gas Fired IC Engines." The requirements pertaining to this engine have been shaded. These tables define emission calculations and the measurement of fuel use as minimum requirements for this engine.

As shown on the grid, a one-time stack test is required for NOx. However, because NOx and CO are correlated, the test will also be required for CO. The test will be required within 365 days of permit issuance. In addition, engines considered as operating in a lean air/fuel environment, as in this case, are required to measure exhaust oxygen concentration as a measure of engine performance. Finally, the facility will be required to use a portable flue gas monitor on a quarterly basis to ensure that NOx and CO limitations are being met. An exceedance under the initial portable analysis requires a re-test using calibration gasses. Failure of the calibration gas test requires notification of the Division and an actual stack test must then be performed. The facility will be allowed to go to semi-annual portable monitor testing when 4 consecutive portable analyzer tests have been performed which do not indicate an exceedance. Any portable monitoring analysis which indicates an exceedance reverts the facility back to the quarterly testing schedule for at least 4 more tests.

4. Compliance Status - Williams Natural Gas submitted a revised Air Pollution Emission Notice (APEN) requesting an increase in allowable NOx, VOC, CO, and fuel use. The facility signed that they were out of compliance with the terms and conditions of 12YU378. However, under the terms of their compliance plan, the facility sought and received modifications to 12YU378 to bring them into compliance. At this time, the Division considers this engine to be in compliance with all applicable requirements.

<u>Unit S2 -</u> VOC emissions from the emergency shutdown device (ESD) and blowdowns.

Discussion:

1. Applicable Requirements - A State of Colorado Initial Approval Construction Permit (95YU191) was issued on June 11, 1996. The permit was moved to Final Approval on September 9, 1996 as per the site inspection and internal guidance memorandum of March 14, 1996 and incorporated directly into the operating permit without the actual issuance of a Final Approval Permit. The following terms and conditions of the Construction Permit have been incorporated into the Proposed Operating Permit as applicable requirements: Annual emission limitation for VOC; Annual limitation on venting of natural gas. Permit 95YU191 included short term hourly emission and venting limitations. Because the annual limits are based on the venting of natural gas for one hour each year, the short term hourly limits will be the same as the annual limits.

Permit 95YU191 also included conditions pertaining to odor and upset conditions. While these are generally applicable to this emission point they are not of major concern and are were not specifically referenced in the Permit. Odor and upset conditions apply to all facilities and can be found in the General Permit Conditions section of the Permit.

Originally in 12YU378, fugitive VOC emissions were determined to be 21.0 TPY. As discussed under Unit S1, Applicable Requirements, fugitive VOC emissions were recalculated and determined to be negligible. Calculations for this can be found in the attached engineering worksheet titled EMISSION FACTOR CONVERSION. Fugitive emissions were therefore found to be exempt under Colorado Regulation No. 3, Part C, Section II. E.3.a. and were not included in the operating permit.

2. Emission Factors - Emissions under this section are produced from the flaring of natural gas during a blowdown or emergency shutdowns. The facility has indicated that during an emergency shutdown they release 107,000 scf of natural gas (calculated from the volume of piping involved). Using a density of 2.32 lb/scf (at 700 psia) and a gas speciation analysis, the facility will calculate the tonnage of VOC released. There are no specific emission factors associated with this emission point.

3. Monitoring Plan - Conditions 2.1 to 2.3 of the Permit list the Monitoring and Recordkeeping provisions necessary to verify compliance with the applicable requirements. Specifically, the facility will need to record the occurrences of emergency shutdowns or blowdowns. A gas analysis that shows the speciation of the natural gas must be performed semi-annually and the results used to determine the type and quantity of pollutants released.

4. Compliance Status - Williams Natural Gas submitted an Air Pollution Emission Notice (APEN) and Construction Permit Application for this emission point. The facility signed that they were out of compliance for failing to report this emission point. However, under the terms of their compliance plan, the facility sought and received Construction Permit 95YU191 to bring them into compliance. At this time, the Division considers this emission point to be in compliance with all applicable requirements.

IV. Insignificant Activities

MISCELLANEOUS: There are several small emission sources which are considered to be insignificant including miscellaneous small containers of chemicals, a lawnmower, and a 9000 gallon storage tank of lubricating oil.

ELECTRIC GENERATOR: A standby electric generator, Waukesha Model F817GU, S/N: 351638 is also on site. Based upon the latest EPA and Division guidance, this engine is operated less than 250 hours per year and is of negligible air quality impact.

V. Alternative Operating Scenarios

There are no alternative operating scenarios associated with this facility.

VI. Permit Shield

The permit shield was not requested for this facility.

VII. Accidental Release - 112(r)

A provision under Part 70 of the Clean Air Act (amended) is the Accidental Release provisions of section 112(r). Under this program, EPA established a list of substances which pose the greatest risk of death or serious injury to humans or extreme harm to the environment. Additionally, a list of flammable substances and high explosives were set forth. Each substance was given a threshold or deminimis level by considering their individual toxicity, reactivity, volatility, flammability, explosiveness, and dispersiveness. Facilities using any of these substances in greater-than-threshold quantities are required to prepare and implement a Risk Management/Prevention Plan for those substances.

The facility has indicated that 112(r) does not apply.