TECHNICAL REVIEW DOCUMENT
FOR
OPERATING PERMIT 95OPCY005
to be issued to:

Mull Drilling Co.
Sorrento Compressor Station
Cheyenne County
Facility ID 0170005

Prepared on October 25, 1995
Revised on June 5, 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 Colorado Title V Operating Permit proposed for this site. It is designed for reference during review of the proposed permit by the EPA, during Public Comment, and for other interested parties. Information in this report is primarily from the application received on December 28, 1994 and additional information received on April 4, April 6, and July 13, 1995. In addition, a site visit was conducted on August 15, 1995 to confirm the application. Numerous phone conversations were also documented.

II. Source Description

This facility is a natural gas compressor station, classified under the Standard Industrial Classification of 1311,which processes gas to remove liquids and moisture and then reinjects it into the producing reservoir. The facility is located in a flat rural area 6 miles North and 6 miles West of the city of Kit Carson in Cheyenne County, Colorado (NE Section 5, T 14S, R49W). The nearest major road is Highway 40 which is 6 miles South of the facility. Two houses are located within 1 to 1 ½ miles of the compressor station. The state of Kansas has been designated as an affected state located within 50 miles of the facility. There are no federal Class I areas within 100 kilometers of the plant. The area in which the plant operates, Cheyenne County, is designated as attainment for all criteria pollutants.

The source is considered to be a minor source (Potential To Emit (PTE) < 250 Tons Per Year (TPY)) for purposes of the Prevention of Significant Deterioration (PSD) program. Facility wide emissions are as follows:

Pollutant	Potential To Emit (TPY)	1995 Actual Emissions (TPY)
NOx	180.70	72.0
CO	71.50	40.2
SO_2	neg	neg
VOC	58.09	13.0
PM	neg	neg
PM_{10}	neg	neg

Potential emissions are based upon existing Colorado Construction Permit limitations. Actual emissions are based upon the last Air Pollution Emission Notices (APENs) received by the Division (4/3/95 and 2/20/97). Emissions of SO_2, PM, and PM_{10} are negligible from the equipment at this facility. This facility is required to provide an updated APEN in the event that actual emissions of any of the above air pollutants increase 5 tons per year 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

A. General Discussion for Internal Combustion Engines (ICEs)

1. Applicable Requirements- All air pollution emission sources are subject to the 20% visible opacity limitation of Regulation 3, Part A.II. as well as the general permit conditions of Section IV of this source's Title V Operating Permit. The following terms and conditions of each engine's construction permit have been incorporated into the Proposed Operating Permit as applicable requirements: yearly and hourly emissions of Carbon Monoxide (CO), Oxides of Nitrogen (NOx), and Volatile Organic Compounds (VOC); annual consumption of natural gas; and opacity.

2. Emission Factors- Emissions for reciprocating engines are produced during the combustion process and are dependent upon the air to fuel ratio adjustment and specific properties of the natural gas being burned. The major pollutants of concern are NOx and CO. Small amounts of VOC, Hazardous Air Pollutants (HAPs), and Particulate Matter (PM and PM_{10}) are also emitted due to incomplete combustion. Oxides of Sulfur (SOx) may also be emitted due to minor amounts of sulfur in the gas stream.

In general, emission factors from the EPA publication "Compilation of Air Pollutant Emission Factors", also known as AP-42, are generally accepted as representative of these engines. AP-42 emission factors have changed over the years. The result of this was a change in the units' emissions. In this case, emission factors from AP-42 Table 3.2-2 for 4-cycle rich burn compressor engines were used for all engines. While this did result in changes in estimated emissions, it may be reasonably assumed that the units were emitting at these levels all along, but, that the knowledge at the time of permit issuance was limited to the existing AP-42 factors. Since under Colorado regulations sources may request their permit levels, the Division has determined that violating old permit terms and conditions solely due to an increase in emission factors will not constitute a violation unless some underlying applicable requirement was violated as well. In this case, only CO increased due to AP-42 updates and did not trigger any new applicable requirements. Therefore, CO emission limits were adjusted accordingly while all other limits remained the same to allow maximum flexibility. Emission factors are listed in the permit as the source's monitoring plan relies upon them. The emission factors used are:

Pollutant	Emission Factor (lbs/mmBTU)
NOx	2.3
CO	1.6
VOC	0.03

3. Monitoring and Compliance-A compliance and monitoring grid has been developed for internal combustion engines. The monitoring scheme for all the engines at this facility has been shaded in the attached grid. The source will measure fuel consumption using a single flow meter for all five engines on a monthly basis. Fuel use for each engine will be apportioned based upon the horsepower-hours of each engine over the month. Fuel use will be used with emission factors and the Btu content of the fuel to determine compliance with both annual and hourly limitations. Because the heat content of the fuel burned at this facility has been dropping over the years, the required fuel needed to obtain the same amount of power for the engines has risen. Therefore, the annual fuel consumption limitation in mmScf/yr was modified to mmBtu/yr since the maximum Btu's consumed by the engines should not vary. Annual limitations for emissions and fuel use will be on a rolling twelve month total. Each month, a new twelve month total will be calculated based upon the previous twelve month's data. Compliance with hourly limitations shall be determined by dividing the monthly values with the hours of operation for each engine. Any exceedance of either hourly or annual limitations will result in the source being considered out of compliance with the terms and conditions of their Operating Permit. A heat analysis of the fuel burned (Btu/Scf) will be performed semi-annually for input to the emissions calculations.

The source will file a revised APEN to the Division if emissions from any engine increase by more than 5 tons/year or 50%, whichever is less, compared to the latest APEN on file with the Division. The 20% opacity standard will be demonstrated by a certification that the engine units used natural gas exclusively during the reporting period. The source will provide compliance monitoring reports semi-annually and compliance certification reports annually.

Also, the emission limitations were revised so that annual and hourly limitations were rounded to one decimal place instead of two.

3. Compliance Status- This facility originally certified that they were in compliance with all applicable requirements. However, subsequent to this, it was determined that New Source Performance Standards (NSPS) KKK for Equipment Leaks of VOC From Onshore Natural Gas Processing Plants applied to this facility. The facility then obtained an initial approval Construction Permit as required under Colorado Regulation No. 3.

All other units are operating in compliance with all applicable requirements. The source is considered to be in compliance with all applicable requirements at this time.

B. Discussion of Individual Emission Unit Permit Conditions-The following emission units are specifically regulated under the terms and conditions of the operating permit proposed for this site:

1. Emission Units S001 and S002

S001- Caterpillar G379TAA, S/N: 72B1182. 4 cycle internal combustion compressor engine #1 rated at 3.4 mmBtu/hr and 465 maximum HP. Natural gas fired.

S002- Caterpillar G379TAA, S/N: 72B1337. 4 cycle internal combustion compressor engine #2 rated at 3.4 mmBtu/hr and 465 maximum HP. Natural gas fired.

a. Emission Permits- Both units were installed and began operation in 1985, went to Public Comment on September 26, 1985, and were issued Initial Approval Emission Permits (85CY204-1&2) on December 12, 1985. Final Approval for the engines was granted on August 19, 1986.

b. Applicable Requirements- The emission permits defined the applicable requirements for both engines including opacity and emission limitations. The engines were limited for NOx, VOC, CO and fuel use. As stated above, due to an emission factor changes, the CO limitations were modified. See applicable requirements discussion above.

c. Emission Factors- See above discussion.

d. Monitoring and Compliance- The units will monitor and meet the compliance schedule as outlined above.

2. Emission Unit S003

S003- Caterpillar G342TA, S/N: 71B03848. Internal combustion engine rated at 2.0 mmBtu/hr and 265 maximum horsepower running propane compressor #1.

a. Emission Permits- The unit was installed and began operation in 1985, went to Public Comment on September 26, 1985, and was issued Initial Approval Emission Permit (85CY204-4) on December 12, 1985. Final Approval for the engine was granted on August 19, 1986.

b. Applicable Requirements- The emission permit defined the applicable requirements for the engine. The engine is limited for NOx, VOC, CO and fuel use. As stated above, due to an emission factor change, CO limitations were modified. See applicable requirements discussion above.

c. Monitoring and Compliance- The unit will monitor and meet the compliance schedule as outlined above.

3. Emission Units S004 and S005

S004- Caterpillar 3304NA, S/N: 3741012. Electrical generator #1 with natural gas engine rated at 0.7 mmBtu/hr and 95 maximum horsepower.

S005- Caterpillar 3304NA, S/N: 37400913. Electrical generator #2 with natural gas engine rated at 0.7 mmBtu/hr and 95 maximum horsepower.

a. Emission Permits- The units were installed and began operation in 1985, went to Public Comment on September 26, 1985, and were issued Initial Approval Emission Permits (85CY204-5&6) on December 12, 1985. Final Approval for both engines was granted on August

19, 1986.

b. Applicable Requirements Discussion- These units may technically be classified as insignificant activities under Regulation 3, Part C, Section II.E.3.nnn as they are stationary internal combustion engines with actual emissions less than five tons per year. Analysis shows that each engine may run up to 6,211 hours per year before exceeding the exemption threshold (1.61 lbs/hr NOx times 6,211 hour/yr divided by 2000 lbs/ton= 5 TPY). However, given that the source will essentially be monitoring run-time hours regardless of the exemption, the units will remain in the permit to allow flexibility of operation without the requirement for modification.

Additionally, the units were permitted so that only one engine could run at one time. There is no air quality or regulatory basis for this. Therefore, that restriction has been eliminated. The result is a minimal increase in pollutants that is primarily due to changes in emission factors.

The engines were limited for NOx, VOC, CO and fuel use. As stated above, due to an emission factor change CO limitations were modified.

c. Emission Factors- See above discussion.

d. Monitoring and Compliance- The unit will monitor and meet the compliance schedule as outlined above.

4. Emission Unit S006

S006- Propak Systems, S/N: 85228K, glycol dehydration unit rated at 0.25 mmBtu/hr and 0.5 gal/lb H_2O recirculation rate. Uses ethylene glycol.

a. Emission Permits

The unit was installed and began operation in 1985. At the time the Division did not have any knowledge about VOC emissions from these units. Therefore, only the heater portion of the dehydrator was initially evaluated. Since that time, there has been data which shows that these units can be a significant source of VOC and HAP emissions. The source has since applied for and received initial approval permit 95CY048 for this source on June 29, 1995. Final approval for the unit was granted on February 20, 1997. A future Maximum Achievable Control Technology (MACT) standard is being developed for glycol dehydrators and may affect future operations.

b. Applicable Requirements Discussion- Until a MACT is developed, there are no control requirements for this unit. The following terms and conditions of 95CY048 have been incorporated into the Proposed Operating Permit as applicable requirements: Annual and daily emission limitations for VOC and gas processing. The ethylene glycol consumption rate shall be monitored and recorded annually instead of monthly as proposed in permit 95CY048 based upon current monitoring guidance.

No data could be found to support the original permit limitation of 6.4 TPY of VOC. The last emissions estimation by the source was then used as a basis for the VOC limitation in the

operating permit. The limitation was increased to give the source a 20% safety factor. This increase was not significant and did not trigger any permit modifications.

Ethylene glycol is contacted with the natural gas stream to remove moisture. This mixture is heated in the still vent portion of the unit to drive off the water and some entrained VOCs. The natural gas is then compressed and re-injected into the reservoir or down the pipeline. The concern with glycol dehydrator units is that emissions are heavily dependent upon several parameters. This unit was modeled using the Gas Research Institute's GLYCalc Version 2 model. The source will be required to monitor the essential parameters for that model. These parameters are stated under the monitoring and compliance section below. The heater portion of the unit is insignificant as defined by Colorado Regulation 3, Part C, Section II.E.3.k.

c. Emission Factors- There is currently no single emission factor available for glycol dehydrators as they are dependent upon too many variables. Instead, the GLYCalc model is used to estimate emissions.

d. Monitoring and Compliance- A compliance and monitoring grid has been developed for glycol dehydrators. The monitoring scheme for this source has been shaded in the attached grid. The source is required to monthly monitor and maintain records of the volume of processed natural gas throughput, ethylene glycol recirculation rate, inlet gas pressure, and inlet gas temperature. As mentioned above, the source will measure ethylene glycol consumption on an annual basis. Because of a good compliance history from this source, an extended wet gas analysis will also be required on a semi-annual basis, instead of quarterly as suggested in the grid, for input to the GLYCalc model. The source will be required to show compliance with both short term and long term limitations for VOC and fuel throughput no less frequently than monthly using the input parameters and the most recent gas analysis listed above and GRI GLYCalc Model version 2.0 or higher. HAPs, while not limited by regulation, must be calculated and reported for annual fee and inventory purposes. Any record-keeping to be used for compliance purposes is subject to the record-keeping requirements of their Operating Permit.

5. Emission Unit S007

S007- Fugitive equipment leaks from the facility.

a. Emission Permits- The facility was installed and began operation in 1985. The source did not recognize that fugitive emissions were emanating from the facility. The source applied and received an initial approval Construction Permit (95CY049) on May 16, 1995. Final approval was granted for the source on February 20, 1997.

b. Applicable Requirements- The fugitive emissions are subject to New Source Performance Standards (NSPS) KKK, Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. This requirement applies for facilities which, in general, extract natural gas liquids from the field gas for other use or sale and have been constructed post June 24, 1984. General recordkeeping and reporting requirements were included covering NSPS KKK.

The following terms and conditions of 95CY049 have been incorporated into the Proposed Operating Permit as applicable requirements: annual and daily VOC emissions; annual and daily natural gas throughput; general NSPS KKK language; NSPS general provisions language (adopted into Colorado Regulation No. 6, Part A, Subpart A). The source is also required to submit, within six months of permit issuance, a report detailing the specific applicable and non-applicable sections of NSPS KKK. Additionally, the source was limited in the construction permit to a specific equipment configuration (valves, flanges, compressor seals). Typically, limiting the component count is considered a form of process control effectively making the permit enforceable as a practical matter. However, it is the intention of the Operating Permit Unit to create as much flexibility in the Operating Permit as possible. Since the intention is to limit VOC emissions, not components, the source will be allowed to make changes to the facility provided that emissions do not increase. The source will achieve this under the monitoring plan outlined below.

c. Emission Factors- Emission factors for fugitive emissions were taken from the EPA document, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995, Table 2-4. The emission factors are (lbs/component-hr):

Valves = 0.0099	Relief Valves = 0.019	Compressor Seals = 0.019
Flanges = 0.00086	Open-ended Lines = 0.0044	Pump Seals = 0.0053

d. Monitoring and Compliance- The source will use an equation that takes into account the number of components and each component's emission factor to calculate the emissions. This equation allows the source the flexibility to make process changes and still comply with their emission limitation. The gas analysis required for the glycol dehydrator shall also be used for this emission source. The most recent gas analysis will be used for the emissions calculations.

Additionally, the source will be required to perform an initial component count within 90 days of the issuance of this permit and every 5 years thereafter. The source may then keep a running total of the additions and subtractions to the component count for use in emissions calculations. On a monthly basis the source will calculate annual and daily emissions and gas throughput. Each month, a new twelve month total shall be calculated using the previous twelve months' data for comparison to annual limitations.

The facility is subject to the monitoring, recordkeeping, and reporting provisions of NSPS KKK. NSPS KKK allows for a great deal of flexibility regarding monitoring schemes. Limiting the facility to a single path would not have allowed the full range of options provided by regulation. Therefore, specifics were not cited in the operating permit. The report required in the permit will detail their particular options regarding monitoring, recordkeeping, and reporting.

The unit will also monitor and meet the compliance schedule as outlined above.

IV. Insignificant Activities

The following list of insignificant activities was provided by the source to assist in the understanding of the facility layout. Since there is no requirement to update such a list, activities may have changed since the last filing.

Insignificant activities and/or sources of emissions as submitted in the application are as follows:

1. Not located at the plant site but part of the Mull Unit are small natural gas fired heater treaters located at the tank batteries.
   - Battery 1 1.37 MMBTU/hr and 0.50 MMBTU/hr
   - Battery 2 1.37 MMBTU/hr and 0.50 MMBTU/hr
   - Battery 3 0.50 MMBTU/hr and 0.35 MMBTU/hr
2. Any chemical storage tanks on site are less than 500 gallons are typically 55 gallon drums.
3. NGL truck loading equipment at plant site loads no more than one truckload or less than 6000 gallons per day.
4. NGL's are stored in two 15,000 gallon tanks.
5. Lubricating oils are stored in tanks with capacities of 500 gallons or less.
6. Crude oil, condensate and water is gathered in two 400 bbl slop tanks.

V. Alternative Operating Scenarios

There are no alternative operating scenarios for this facility.

VI. Permit Shield

The permit shield was requested for the following specific items:

Fugitive Emissions - State Regulation Number 8, Part A, adoption by reference 40 CFR part 61, subpart J. This facility does not have any equipment in benzene service.

Units in sweetening service - State Regulation Number 6, Part A, adoption by reference 40 CFR part 60, subpart LLL. This facility does not have any sweetening units.

Fugitive units in VHAP service - State Regulation Number 6, Part A, adoption by reference 40 CFR Part 61, subpart V. This facility does not have any units in VHAP service.

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.

At this time, the Division believes that this facility would not be subject to 112(r) based on the revisions EPA proposed to the List of Regulated Substances, published in the Federal Register on April 15, 1996. The proposed revisions exempt naturally occurring hydrocarbon mixtures from threshold determination (§68.115(b)(2)(iii)). Since the liquids generated at Sorrento are sold for further processing, the Division believes that this exemption would apply. On June 20, 1996 EPA issued a "stay of effectiveness" regarding the proposed revisions to the List of Regulated Substances that allows a source that is affected by the April 15, 1996 proposed revisions to consider themselves not subject to Part 68 (112(r)) requirements until EPA determines whether to proceed with the revisions to the List of Regulated Substances. The stay is effective for 18 months (until December 22, 1997). The Division believes that it is in the best interest of the source to not include 112(r) as an applicable requirement at this time.