TECHNICAL REVIEW DOCUMENT for OPERATING PERMIT 980PRB202

to be issued to:

Rocky Mountain Natural Gas Company
Piceance Creek Gas Plant and Compressor Station
Rio Blanco County
Source ID 1030037

Prepared by Ashley Campsie September 24, 1999

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. The conclusions made in this report are based on information provided in the original application submittal of August 17 and a review of APCD files. This narrative is intended only as an adjunct for the reviewer and has no legal standing.

On April 16, 1998 the Colorado Air Quality Control Commission directed the Division to implement new procedures regarding the use of short term emission and production/throughput limits on Construction permits. These procedures are being directly implemented in all operating permits that had not started their Public Comment period as of or requested a modification after April 16, 1998. All short term emission and production/throughput limits that appeared in the construction permits associated with this facility that are not required by a specific State or Federal standard or by the above referenced Division procedures have been deleted and all annual emission and production/throughput limits converted to a rolling 12 month total. Note that, If applicable, appropriate modeling to demonstrate compliance with the National Ambient Air Quality Standards was conducted as part of the Construction Permit processing procedures. If required by this permit, portable monitoring results and/or EPA reference test method results will be multiplied by 8760 hours for comparison to annual emission limits unless there is a specific condition in the permit restricting hours of operation.

Any revisions made to the underlying construction permits associated with this facility made in conjunction with the processing of this operating permit application have been reviewed in accordance with the requirements of Regulation No. 3, Part B, Construction Permits, and have been found to meet all applicable substantive and procedural requirements. This operating permit incorporates and shall be

considered to be a combined construction/operating permit for any such revision, and the permittee shall be allowed to operate under the revised conditions upon issuance of this operating permit without applying for a revision to this permit or for an additional or revised Construction Permit.

II. Source Description:

This source is classified as a Natural Gas Production and Transmission facility as defined under Standard Industrial Classification 4922. Reciprocated engines are used to drive compressors, which compress natural gas for delivery to pipeline, and drive an electrical generator. Natural gas is processed by one of two natural gas liquid extraction plants, which remove natural gas liquids. Natural gas liquids product is collected and stored in pressure vessels and transported offsite via trucks.

The facility is located in Rio Blanco County southwest of Meeker in an area designated as attainment for all criteria pollutants. This facility is within 100 km of Flattops Wilderness, a Federal Class I area and is within 50 miles of another state, Utah. This source is subject to 40 CFR Part 60, Subpart KKK Standards of Performance for Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. This source is considered to be a minor source in an attainment area (no criteria pollutant with a Potential to Emit > 250 Tons/Year) and is not considered major for purposes of Prevention of Significant Deterioration (PSD) regulations.

The facility is a 112(r) source and submitted their Risk Management Plan on June 20, 1999. The source indicated in their Title V application, that they consider themselves in compliance with all current applicable requirements except for permit limits that were in the process of modification at the time of issuance. Facility wide emissions are as follows:

<u>Pollutant</u>	Potential Emissions (tpy)	Actual Emissions (tpy)
NOX	192.4	192.4
CO	231.3	231.3
VOC	44.4	44.4

Facility wide potential emissions are based on worst case emissions at equipment maximum design rates (permit exempt units) and permit limits. Actual emissions were not indicated on APENs therefore they are assumed to be the same as potential.

The new Oil and Gas MACT was promulgated on June 17, 1999. It includes two Subparts; HH - NESHAP for Oil and Natural Gas Production and HHH - NESHAP for Natural Gas Transmission and Storage Facilities. The source is not major for HAPs (no single HAP equal to or greater 10 tons per year, nor combination of HAPs equal to or greater than 25 tons per year).

III. Emission Sources:

The following sources are specifically regulated under terms and conditions of the Operating Permit for this Site:

<u>Unit S001</u> - Waukesha Model F817 GU, 4 Cycle Standard Rich Burn, Natural Gas Fired Internal Combustion Engine in Refrigeration Service, Site rated at 83 HP, Serial No. 241424. (1992)

Discussion:

1. Applicable Requirements- This unit was installed and began operation in 1992. Initial approval construction permit 92RB1423-2 was issued on February 8, 1993. A subsequent test showed that actual emissions were higher than originally issued using AP-42 emission factors, therefore, the source requested (July 21, 1998) that the construction permit limits be modified. Initial approval construction permit 92RB1423-2 was issued on September 20, 1999 with the following applicable requirements: Opacity limited to 20%; emissions limitations for Nitrogen Oxides are 16.0 tons per year, for Volatile Organic Compounds 1.6 tons per year, and for Carbon Monoxide 24.0 tons per year; consumption of natural gas shall not exceed 6.8 MMscf per year, and a revised Air Pollutant Emission Notice (APEN) shall be filed when a significant change in actual emissions occurs.

The emission limit for VOC is less than APEN deminimis and has a corresponding throughput limit to demonstrate compliance, therefore, it will not be included in the operating permit.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and/or the equipment commenced operation. Therefore, the Division considers that the Responsible Official certification submitted with that report will serve as the self-certification for construction permit 92RB1423-2 and the appropriate provisions of the construction permit have been directly incorporated into this operating permit.

2. Emission Factors- Emissions from this reciprocating engine 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 pollutants of concern are Nitrogen Oxides (NOX), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted when combustion is incomplete. Approval of emission factors for this engine is necessary to the extent that accurate actual emissions are required to verify the need to submit Revised APENs to update the Division Emission Inventory. The following factors are higher than AP-42 Table 3.2-1

values for 4 Cycle, Rich Burn engines and are therefore acceptable to the Division:

<u>Pollutant</u>	Emission Factor	<u>AP-42</u>
NOX	5.50 lb/MMBtu	2.3 lb/MMBtu
CO	8.26 "	1.6 "
VOC	0.55 "	0.03 "

3. Monitoring Plan- The source proposed to allocate fuel usage and use the emission factors above to calculate emissions on a monthly basis. The source will also be required to determine Btu content on a semi-annual basis using heats of combustion and gas analysis results.

The Opacity standard of 20% will be demonstrated by a certification that the engine unit has used natural gas exclusively during the reporting period. The BTU Content of the natural gas used shall be calculated using the most recent gas analysis and the equation below:

4.

LHV Btu/scf=
$$\frac{\sum\limits_{i}(C_{i} \ mol \ \%)(Hc_{i} \ Btu/scf)}{100}$$

where:

C_i = Concentration of Component i mol %

Hc_i = Heat of Combustion (vapor state of reactants) at 60 °F, 14.696 psia Btu/scf

Compliance Status- A current APEN reporting criteria emissions is on file with the Division. A review of APCD files has revealed no outstanding compliance issues. Therefore, this facility is currently considered to be in compliance with all applicable requirements.

<u>Unit S002</u>- Waukesha Model F1197 GU, 4 Cycle Standard Rich Burn, Natural Gas Fired Internal Combustion Engine in Refrigeration Service, Site Rated at 145 HP, SN: 221043 (1982)

<u>Unit S003</u> - Waukesha Model F3711 GU, 4 Cycle Standard Rich Burn, Natural Gas Fired Internal Combustion Engine, Site Rated at 325 HP, SN: 447584 (1982)

<u>Unit S004</u> - Waukesha Model F817 GU, 4 Cycle Standard Rich Burn, Natural Gas Fired Internal Combustion Engine Used to Drive Electric Generator, Site Rated at 83 HP, SN: 202574 (1982)

Discussion:

1. Applicable Requirements- These engines were installed and began operation in 1982. At that time, Colorado Regulation No. 3 exempted from

permitting requirements any gas-fired Internal Combustion engine rated at less than 1000 HP. These engines meet that criteria (see Exemption Letters 98RB0507-98RB0509). Consequently, the only applicable requirements for these engines are a 20% Opacity limitation and APEN Reporting in accordance with Regulation 3, Part A.II.

2. Emission Factors- Emissions from these 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 pollutants of concern are Nitrogen Oxides (NOX), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted when combustion is incomplete. Approval of emission factors for this engine are necessary to the extent that accurate actual emissions are required to verify the need to submit Revised APENs to update the Division Emission Inventory.

Pollutant Pollutant	S002 and S003	<u>S004</u>
NOX	20.0 g/hp-hr	20 g/hp-hr
CO	20.0 "	30.0 "
VOC	2.0 "	2.0 "

All emission factors are more conservative than AP-42 values.

3. Monitoring Plan- The source proposed to allocate fuel usage and use the emission factors above to calculate emissions on an annual basis. The source may record hours of operation and use the horsepower based emission factors above to determine emissions annually.

The Opacity standard of 20% will be demonstrated by a certification that the engine unit has used natural gas exclusively during the reporting period.

4. Compliance Status- A current APEN reporting criteria emissions is on file with the Division. A review of APCD files has revealed no outstanding compliance issues. Therefore, this facility is currently considered to be in compliance with all applicable requirements.

<u>Unit E005</u> - Superior Model 6G510 GU, 4 Cycle Standard Rich Burn, Natural Gas Fired Internal Combustion Engine, Site rated at 320 HP, SN:18018 (1988)

Discussion:

1. Applicable Requirements- This unit was installed and began operation in 1988. Final Approval Construction Permit 88RB149 was issued on June 28, 1993. A subsequent test showed that actual emissions were higher then originally permitted using AP-42 emission factors. Therefore, the source

requested (July 21, 1998) that the construction permit limits be modified. Initial approval construction permit 88RB149 was issued on September 20, 1999 with the following applicable requirements: Opacity limited to 20%; emissions limitations for Nitrogen Oxides are 61.7 tpy, for Volatile Organic Compounds are 6.2 tpy, and for Carbon Monoxide 92.6 tpy; consumption of natural gas shall not exceed 29.4 MMscf per year.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and/or the equipment commenced operation. Therefore, the Division considers that the Responsible Official certification submitted with that report will serve as the self-certification for construction permit 88RB149 and the appropriate provisions of the construction permit have been directly incorporated into this operating permit.

2. Emission Factors- Emissions from this reciprocating engine 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 pollutants of concern are Nitrogen Oxides (NOX), Carbon Monoxide (CO) and Volatile Organic Compounds (VOC). Small quantities of Hazardous Air Pollutants (HAPs) are also emitted when combustion is incomplete. Approval of emission factors for this engine are necessary to the extent that accurate actual emissions are required to verify the need to submit Revised APENs to update the Division Emission Inventory. The following factors are higher than AP-42 Table 3.2-1 values for 4 Cycle, Rich Burn engines and are therefore acceptable to the Division:

<u>Pollutant</u>	Emission Factor	<u>AP-42</u>
NOX	4.89 lb/MMBtu	2.3 lb/MMBtu
CO	7.34 "	1.6 "
VOC	0.48 "	0.03 "

3. Monitoring Plan-The source proposed to allocate fuel usage and use the emission factors above to calculate emissions on a monthly basis. The source will also be required to determine Btu content on a semi-annual basis using heats of combustion and gas analysis results.

The Opacity standard of 20% will be demonstrated by a certification that the engine unit has used natural gas exclusively during the reporting period. The BTU Content of the natural gas used shall be calculated using the most recent gas analysis and the equation below:

$$LHV \; Btu/scf = \frac{\sum\limits_{i} (C_{i} \; mol \; \%)(Hc_{i} \; Btu/scf)}{100}$$

where:

C_i = Concentration of Component i mol %

Hc; = Heat of Combustion (vapor state of reactants) at 60 °F, 14.696 psia Btu/scf

4. Compliance Status- A current APEN reporting criteria emissions is on file with the Division. A review of APCD files has revealed no outstanding compliance issues. Therefore, this facility is currently considered to be in compliance with all applicable requirements.

<u>Unit S006</u> - Process Equipment Corporation Ethylene Glycol Dehydrator Regenerator Still Vent, Maximum Rated at 5.0 MMscfd (1992)

Discussion:

1. Applicable Requirements- This Unit was installed and began operation at the site in 1992. Initial Approval construction permit 94RB756 was issued on December 2, 1996 (with a transfer of ownership in 1998) with the following applicable requirements: Visible emissions shall not exceed twenty percent (20%) opacity, emissions of air pollutants shall not exceed 7.8 tons/yr Volatile Organic Compounds (VOC), processing of natural gas shall not exceed 3,285.0 MMscf/yr, lean glycol flow rate shall not exceed 0.96 gallons per minute, monthly records of actual natural gas throughput and APEN Reporting in accordance with Regulation 3, Part A.II. The source requested (August 17, 1998) that the construction permit limits be modified. Final Approval was issued on September 17, 1999 with the following new limits:

<u>Parameter</u> New Limit
Recirculation Rate 5.0 gal/min
Natural Gas Processing 1825 MMscf/yr

2. Emission Factors- Ethylene glycol is contacted with the natural gas stream to remove moisture. This mixture is heated in the still vent portion of the unit which drives off the water and some entrained VOCs. Emissions from this process are typically predicted using the Gas Research Institute's GLYCalc (Version 3 or higher) Model. Emission factors of VOCs and various HAPs are dependent upon the variables input into this Model. These variables include glycol recirculation rate, cubic feet of gas processed, desired moisture content (dew point) of processed gas, and percentage breakdown by weight of constituents in the natural gas. Combustion

emissions from the heater are exhausted through a separate stack. This heater falls under the insignificant activity category of Colorado Reg. 3, Part C, Section II.E.3.k. Therefore, these emissions do not need to be included in the Operating Permit.

- **3. Monitoring Plan-** The Gas Research Institute's manual for their GLYCalc Version 3.0 Model defines the cold separator temperature, glycol recirculation rate, and gas BTEX content as the three critical inputs to the Model for Ethylene glycol units. Changes to the gas flow rate and inlet pressure do not radically affect emissions from glycol dehydrators. Therefore, parametric monitoring of the cold separator temperature, recirculation rate and BTEX content will be required as part of the monitoring plan for this site as detailed in Condition 4.1 of Section II of the Operating Permit. Inlet pressure will be held constant for modeling purposes. Modeling will only be required when the measured values for cold separator temperature, recirculation rate and BTEX content do not meet the comparison criteria as related to the stipulated values in Condition 4.1. of the permit. The specific parameter values listed in the permit were supplied by the source and define a worst-case scenario for dehydrator emissions.
- **4. Compliance Status-** A current APEN reporting criteria emissions is on file with the Division. A review of APCD files has revealed no outstanding compliance issues. Therefore, this facility is currently considered to be in compliance with all applicable requirements.

Unit F001 - Fugitive Emissions of VOCs from Equipment Leaks

Discussion:

1. Applicable Requirements- The Division has made the determination that Fugitive VOC emissions from equipment leaks at gas compression or processing facilities must be calculated and evaluated for the appropriate permitting requirements. Initial Approval construction permit (92RB1423-1) was issued on February 8, 1993 with the following applicable requirements: visible emissions shall not exceed twenty percent (20%) opacity, emissions of Volatile Organic Compounds shall not exceed 3.7 tons per year and 0.8 pounds per hour, 40 CFR Part 60, Subpart KKK requirements include inspection, maintenance, record keeping and reporting requirements, and APEN Reporting in accordance with Regulation 3, Part A.II. The source requested (August 17, 1998) that the construction permit limits be modified. The new factors (as listed below) were examined and the requested revised limits will be included in the operating permit as the new applicable emission limits.

Pollutant New Emission Limit
VOC 18.1

The short term limit was removed per the policy stated above.

The due date of the first semi-annual monitoring report required by this operating permit will be more than 180 days after the initial approval construction permit was issued and/or the equipment commenced operation. Therefore, the Division considers that the Responsible Official certification submitted with that report will serve as the self-certification for construction permit 92RB1423-1 and the appropriate provisions of the construction permit have been directly incorporated into this operating permit.

- **2. Emission Factors -** The source has calculated emissions from equipment leaks based on emission factors from EPA's Protocol for Emission Leak Estimates. Factors are multiplied by the number of components of each type (e.g. Compressor Seals) and the VOC weight percentage in the gas stream as determined in the most recent analysis. EPA factors are given in terms of Total Organic Compounds.
- **3. Monitoring Plan-** As a means of recordkeeping, an initial physical hard-count of facility components will be conducted within 90 days of permit issuance to verify existing hardware inventory. Records shall be kept of all component additions and deletions, and a running tally maintained. A physical hard-count of facility components shall be conducted every five years following the initial count required under this condition.

The source will be required to submit a report detailing the specific applicable and non applicable sections of NSPS KKK to the Division within 6 months of the Operating Permit issue date following the format provided in Appendix G of the draft Operating Permit. Compliance with the reporting requirements of NSPS KKK shall be demonstrated semi-annually.

4. Compliance Status- A current APEN reporting criteria emissions is on file with the Division. The source submitted a request to modify the permit within their application. A review of APCD files has revealed no outstanding compliance issues. Therefore, this facility is currently considered to be in compliance with all applicable requirements.

IV. Insignificant Activities

Condensate storage tank (300 bbl)
Two ethylene glycol storage tanks (2,000 gal and 250 gal)
Used oil storage tank (1,000 gallons)
Methanol Storage Tank (5,000 gallons)
Two NGL/LPG pressurized storage vessels (30,000 gallons and 1,000 gallons)
Various drain sumps

V. Alternative Operating Scenarios

Rocky Mountain Natural Gas Company has requested that temporary and permanent engine replacement be allowed as an alternative operating scenario if they can determine through flue gas analyzer testing that emissions will be equal to or less than those from the engine replaced. The Division has concluded that temporary replacement will be defined as less than a 3 month period and permanent greater than 3 months. The source must be willing to accept a determination of non-compliance should flue gas analyzer testing indicate that the emission factors for the engine in question exceed those defined in the Operating Permit. Non-compliance will be considered to have occurred from the day the engine was replaced.

VI. Permit Shield

40 CFR 60, Subpart KKK (as directly incorporated in Regulation No. 6, Part A)- The compressors associated with Unit S002, S003 and S004 are exempt from this regulation, as the manufacturer date predates the January 20, 1984 effective date of this regulation and have not been modified or reconstructed since installed in 1982.

40 CFR 60, Subparts K (as directly incorporated in Regulation No. 6, Part A) - No petroleum liquids are stored on-site.

40 CFR 60, Subparts Ka (as directly incorporated in Regulation No. 6, Part A) - No tanks installed prior to effective date located at this facility.

40 CFR 60, Subparts Kb (as directly incorporated in Regulation No. 6, Part A) - All tanks either have design capacities less than applicable thresholds, or are pressure vessels designed to operate in excess of 15 psig.

40 CFR 60, Subparts LLL (as directly incorporated in Regulation No. 6, Part A) - Gas processing at this facility designed to remove moisture and natural gas liquids only. No sulfur recovery is affected by this equipment.