Columbia Pipeline Group

Kelly D. Taylor
Environmental Air Quality
Environmental Coordinator
1700 MacCorkle Avenue SE
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June 24, 2015

Mr. William F. Durham, Director
WVDEP - Division of Air Quality
601 57th Street SE
Charleston, West Virginia 25304

Columbia Gas Trans LLC
Kenova
099-00014
R13-2251E
Jerry Williams

RE: Minor Modification Application (Revision to Title V)
Columbia Gas Transmission, LLC
Kenova Compressor Station (Facility ID # 099-00014)

Dear Mr. Durham,

Attached is an application for the use of minor modification procedures to revise Title V permit R30-09900014-2012(MM01) for the Columbia Gas Transmission – Kenova Compressor Station, located in Wayne County, West Virginia. This application consists of a Regulation 13 application package requesting correction of the Station's classification from a major source of hazardous air pollutants (HAPs) to a minor source of HAPs.

The Station consists of eight (8) natural gas-fired reciprocating internal combustion engines (RICE) used to compress natural gas. Engines E01 through E04 compress the gas prior to delivery to the adjacent MarkWest natural gas liquids (NGL) processing facility. At this point, a transfer of custody occurs as the gas enters the MarkWest facility. The MarkWest facility then extracts propane and heavy hydrocarbons from the incoming natural gas before custody of the natural gas is transferred back to the Kenova Compressor Station for further compression by engines E05 through E08.

The Station was incorrectly designated as a major source of HAPs in recent permitting actions. As discussed further throughout this application and in 2005 correspondence with the Department (included in Attachment D), emissions from units E01 through E04, the MarkWest facility, and units E05 through E08 should be aggregated separately in order to determine major source status under 40 CFR 63. Formaldehyde emissions from the aggregate of engines E01 through E04 and the aggregate of engines E05 through E08 are each less than the 10 tpy major source threshold. Therefore, the Station is considered a minor (area) source of HAPs.

Auxiliary equipment at the facility includes a natural gas-fired emergency generator, a heater, and a boiler. NESHAP applicability and requirements for equipment at the Station will be updated through this application for the correction from a major to a minor source of HAPs.

The Station's potential to emit (PTE) exceeds the Title V applicability threshold for nitrogen oxides and carbon monoxide; therefore, the Station is considered a Title V source for permitting purposes. This application package includes all required forms and attachment for a minor NSR construction permit application. A check in the amount of $1,000 is included for application fees.

Columbia Pipeline Group

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Charleston, West Virginia 25314
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kellytaylor@cpg.com

Should you have any questions or need additional information, please feel free to contact the undersigned at (304) 357-2047 or via email at kellytaylor@cpg.com.

Sincerely,

Kelly D. Taylor
Environmental Coordinator

Attachments

APPLICATION FOR 45 CSR 13
MODIFICATION PERMIT
AND
TITLE V PERMIT MODIFICATION

Columbia Gas Transmission LLC
Kenova Compressor Station
Wayne County, West Virginia
Title V Permit No. R30-09900014-2012(MM01)

June 2015

Table of Contents

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☐ **CONSTRUCTION** ☒ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☒ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY. Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
Columbia Gas Transmission LLC

2. Federal Employer ID No. ***(FEIN):***
310802435

3. Name of facility *(if different from above):*
Kenova Compressor Station

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
Columbia Gas Transmission LLC
1700 MacCorkle Ave, SE
Charleston, WV 25314

5B. Facility's present physical address:
2000 Big Sandy River Rd Route 1
Kenova, WV 25530

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**
- If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**
- If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: Columbia Energy Group, Inc.

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☒ **YES** ☐ **NO**
- If **YES,** please explain: Application is for an existing natural gas compressor station which Columbia Gas owns and operates
- If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Natural gas compressor station

10. North American Industry Classification System **(NAICS)** code for the facility:
486210

11A. DAQ Plant ID No. (for existing facilities only):
099–00014

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
R30-09900014-2012(MM01), R13-2251D

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B.**

Traveling I-64 West from Charleston, take the Kenova-Ceredo exit for US Route 52. Follow US 52 South approximately 2 miles to Route 1 intersection. The station is located on Route 1 near the intersection of Route 1 and Route 52.

12.B. New site address (if applicable):	12C. Nearest city or town: Kenova	12D. County: Wayne
12.E. UTM Northing (KM): 4,248.2	12F. UTM Easting (KM): 360.9	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility: Correction of the Station from a major source to a minor source of hazardous air pollutants.

14A. Provide the date of anticipated installation or change: N/A – If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: N/A

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
Hours Per Day 24 Days Per Week 7 Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17. **Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18. **Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance*)** .
– Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**
– Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

– For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☐ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	
☐ General Emission Unit, specify		

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☐ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify: Non-selective catalytic reduction (NSCR)

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☐ **YES** ☒ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below: Delegation of Authority Letter provided in lieu of Authority Form

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☐ **Responsible Official** / ☒ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ DATE: 6-30-15
(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Leland Johnston		35C. Title: Manager of Operations
35D. E-mail: lelandjohnston@cpg.com	36E. Phone: 304-722-8628	36F. FAX: 304-722-8420
36A. Printed name of contact person (if different from above): Kelly Taylor		36B. Title: Environmental Safety & Sustainability Coordinator
36C. E-mail: kellytaylor@nisource.com	36D. Phone: 304-357-2047	36E. FAX: 304-357-2770

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION.

- ☒ **Attachment A: Business Certificate**
- ☒ **Attachment B: Map(s)**
- ☐ **Attachment C: Installation and Start Up Schedule**
- ☒ **Attachment D: Regulatory Discussion**
- ☒ **Attachment E: Plot Plan**
- ☒ **Attachment F: Detailed Process Flow Diagram(s)**
- ☒ **Attachment G: Process Description**
- ☒ **Attachment H: Material Safety Data Sheets (MSDS)**
- ☒ **Attachment I: Emission Units Table**
- ☒ **Attachment J: Emission Points Data Summary Sheet**
- ☒ **Attachment K: Fugitive Emissions Data Summary Sheet**
- ☒ **Attachment L: Emissions Unit Data Sheet(s)**
- ☒ **Attachment M: Air Pollution Control Device Sheet(s)**
- ☒ **Attachment N: Supporting Emissions Calculations**
- ☒ **Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans**
- ☒ **Attachment P: Public Notice**
- ☐ **Attachment Q: Business Confidential Claims**
- ☒ **Attachment R: Authority Forms**
- ☒ **Attachment S: Title V Permit Revision Information**
- ☒ **Application Fee**

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ ***Forward 1 copy of the application to the Title V Permitting Group and:***
- ☐ ***For Title V Administrative Amendments:***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit,***
- ☐ ***For Title V Minor Modifications:***
  - ☐ ***Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,***
  - ☐ ***NSR permit writer should notify Title V permit writer of draft permit.***
- ☐ ***For Title V Significant Modifications processed in parallel with NSR Permit revision:***
  - ☐ ***NSR permit writer should notify a Title V permit writer of draft permit,***
  - ☐ ***Public notice should reference both 45CSR13 and Title V permits,***
  - ☐ ***EPA has 45 day review period of a draft permit.***

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

Attachment A

Business Certificate

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
COLUMBIA GAS TRANSMISSION LLC
5151 SAN FELIPE ST 2500
HOUSTON, TX 77056-3639

BUSINESS REGISTRATION ACCOUNT NUMBER: **1025-1555**

This certificate is issued on: 07/1/2011

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

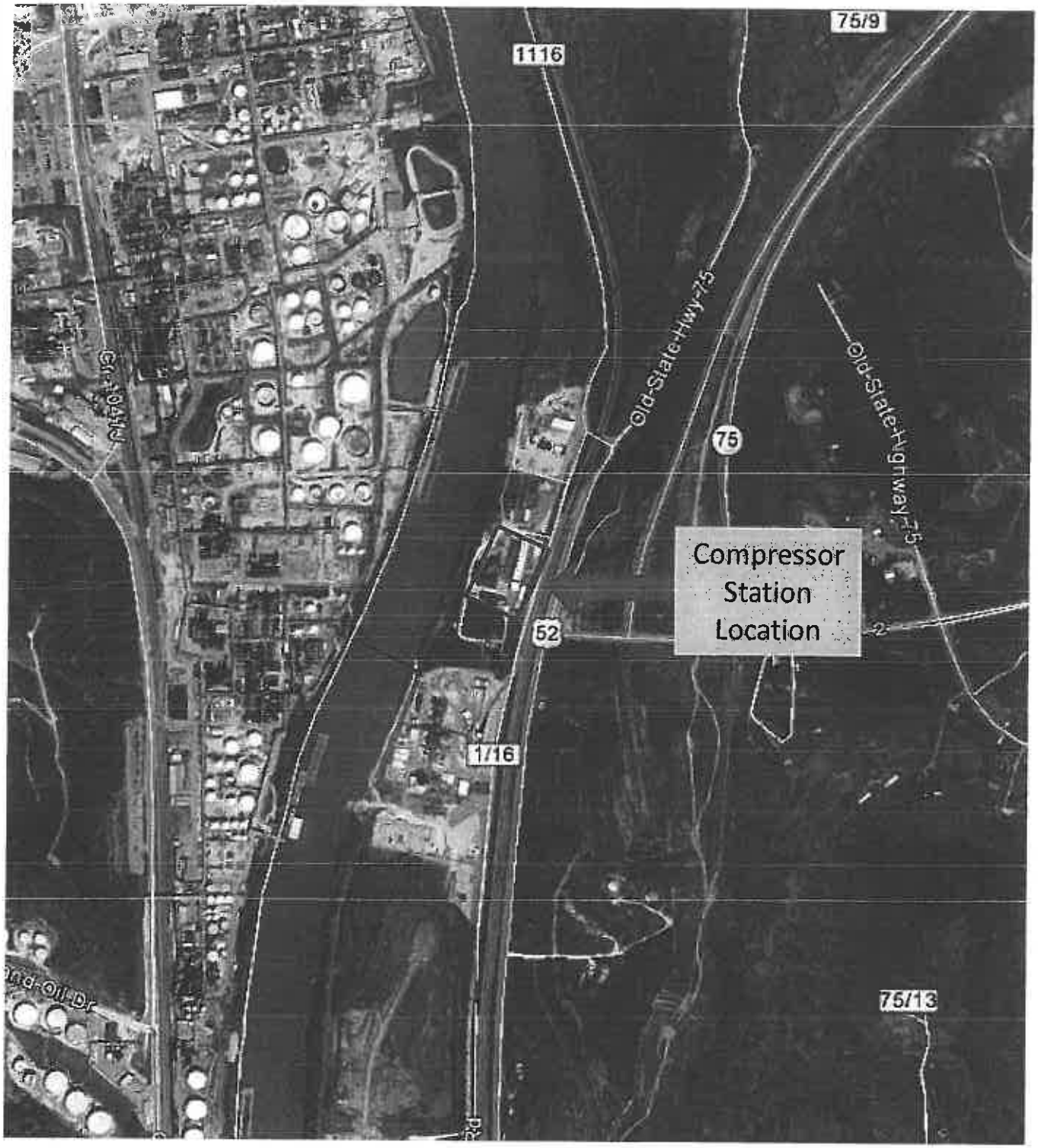
Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.4
L1430813824

Attachment B

Map



Traveling I-64 West from Charleston, take the Kenova-Ceredo exit for US Route 52. Follow US 52 South approximately 2 miles to Route 1 intersection. The station is located on Route 1 near the intersection of Route 1 and Route 52.

	Attachment B
Date: June 2015	Facility Map Kenova Compressor Station

Attachment D-1

Regulatory Discussion

1.0 INTRODUCTION

1.1 Summary and Conclusions

Columbia Gas Transmission, LLC (Columbia) operates the Kenova Compressor Station (the "Station") under Title V Permit No. R30–09900014-2012(MM01). Columbia is requesting correction of the Station's classification from a major source of hazardous air pollutants (HAPs) to a minor source of HAPs. Additionally, the application will be used to modify the Station's Title V permit to reflect this change. Due to the inclusion of the control devices required by 40 CFR 63 Subpart ZZZZ, potential carbon monoxide (CO) and volatile organic compound (VOC) emissions from the Station will be reduced as a result of this application.

An analysis of federal and state regulations was performed to identify applicable air quality regulations. Federal and state regulations associated with the proposed modification include the following.

- Prevention of Significant Deterioration (PSD) requirements do not apply because there will be no changes in potential or actual emissions associated with the permit modification.
- National Emission Standards for Hazardous Air Pollutants (NESHAP) for stationary reciprocating internal combustion engines (40 CFR 63 Subpart ZZZZ) are applicable to the eight (8) reciprocating internal combustion engines (RICE) and one (1) emergency generator. These units are subject to the requirements for equipment located at an area source of HAPs.
- NESHAP for Industrial, Commercial, and Institutional Boilers and Process Heaters (40 CFR 63 Subpart DDDDD) was previously included in the permit for one (1) boiler based on the Station's erroneously designation as a major source of HAPs. This subpart does not apply based on the corrected (minor source) HAP status for the Station.
- NESHAP for Industrial, Commercial, and Institutional Boilers (40 CFR 63 Subpart JJJJJJ) is not applicable to natural gas-fired heaters.
- Compliance Assurance Monitoring (CAM) for major sources (40 CFR 64) is not applicable. This regulation does not apply because the engines using add-on emission controls are subject to Subpart ZZZZ which was promulgated after November 1990.
- Permits for Construction or Modification of Stationary Sources of Air Pollutants (45 CSR 13) is applicable. A permit application is being submitted to WVDAQ as part of this application package.
- Requirements for Operating Permits (45 CSR 30) is applicable. A minor modification application is being submitted to WVDAQ as part of the application package.

1.2 Report Organization

The proposed permit modification is described in Section 2.0. An analysis of applicable regulations and proposed compliance procedures is presented in Section 3.0. Completed permit application forms, including emissions estimating basis, emission calculations and supporting data are contained within this application package.

2.0 DESCRIPTION

2.1 Description of Existing Facility

Columbia's Kenova Compressor Station is located in Wayne County, West Virginia, near the town of Kenova. The Station receives natural gas via pipeline from an upstream compressor station, compresses it using natural gas-fired reciprocating internal compressor engines (RICE), and transmits it via pipeline to a processing facility that is not owned or operated by Columbia. The gas is then transmitted back to the Station via pipeline and compressed using RICE for transmission to a downstream station. The Station is covered by Standard Industrial Classification (SIC) 4922 and operates under Title V Permit No. R30-009900014-2012(MM01). The Station has the potential to operate seven (7) days per week, twenty-four (24) hours per day.

The Station currently consists of eight (8) RICE including:

- Four (4) 2,000-hp natural gas-fired, Cooper-Bessemer two-cycle, lean-burn RICE installed in 1959; and
- Four (4) 1,100-hp natural gas-fired, Ingersoll-Rand four-cycle, rich-burn RICE installed in 1959.

Auxiliary equipment at the Station includes one (1) 500-hp natural gas-fired Waukesha emergency generator, one (1) natural gas-fired line heater, one (1) natural gas-fired boiler, and numerous tanks for the storage of various low pressure liquids. A plot plan of the Station is provided as Attachment E.

Wayne County is classified as attainment or unclassifiable for all National Ambient Air Quality Standards. It is a maintenance area for the 1997 8-hour ozone and annual $PM_{2.5}$ standards. There are no Class I areas located within 100 kilometers of the Station.

2.2 Description of Modification

This modification is for the correction of the Station's classification from a major source of HAPs to a minor source. As discussed below, emissions from engines E01 through E04 should be aggregated separately from the emissions from engines E05 through E08. This change is supported by an August 10, 2005 determination from the WVDEP that concluded that the Kenova Compressor Station is not subject to 40 CFR 63 Subpart ZZZZ (henceforth, "2005 determination"). This determination was made in consultation with Region 3 of the U.S. Department of Environmental Protection (USEPA). The 2005 determination is included as Attachment D-2.

At the Kenova Compressor Station, natural gas is received at the suction side of compressor engines E01 through E04. These engines compress the gas prior to delivery to the MarkWest Natural Gas Liquids (NGL) facility, at which point custody is transferred as the gas enters a processing plant. The point of custody transfer takes places at the meter measuring station located directly behind Columbia's Kenova office building. The MarkWest facility extracts propane and heavy hydrocarbons from the incoming natural gas. When MarkWest has finished the NGL extraction process, the custody of the natural gas is then transferred back to Columbia's Kenova Compressor Station for additional compression with engines E05 through E08.

A major source of HAPs is a source that has the potential to emit 10 tons per year or more of any single HAP or 25 tons per year or more of any combination of HAPs, as defined in Section 112(a)(1) of the 1990 Clean Air Act Amendments and in 40 CFR §63.2.

The USEPA defines "major source" for Subpart ZZZZ in 40 CFR §63.6675 as follows:

> *Major Source, as used in this subpart, shall have the same meaning as in 63.2, except that:*
>
> *(1) Emissions from any oil or gas exploration* or *production well (with its associated equipment* (as *defined in this section)) and emissions from any pipeline compressor station* or *pump station shall not be aggregated with emissions from other similar units, to determine whether such emission points or stations are major sources, even when emission points are in* a *contiguous area* or *under common control;*
> *(2) For oil and gas production facilities, emissions from processes, operations, or equipment that are not part* of *the* same *oil and gas production facility,* as *defined in* §63.1271 *of subpart HHH of this part, shall not be aggregated;*
> *(3) For production field facilities, only HAP emissions from glycol dehydration units, storage vessel with the potential for flash emissions, combustion turbines and reciprocating internal combustion engines shall be aggregated for* a *major source determination; and*
> *(4) Emissions from processes, operations, and equipment that are not part* of *the same natural gas transmission and storage facility,* as *defined in* §63.1271 of *subpart HHH* of *this part, shall not be aggregated.*

It is important to note the definition of facility, and the differentiation between oil and gas production facilities and natural gas transmission facilities. As discussed in §63.1270 and §63.1271, equipment located at a single site prior to custody transfer or a natural gas processing plant is classified an oil and gas production facility, while equipment located at a single site downstream of an oil and gas production facility is classified as a transmission and storage facility. As stated in the above definition of major source, emissions that are not part of the same facility are not to be aggregated for determining major source status.

Custody transfer is defined in §63.6675 as:

> *Custody transfer means the transfer of hydrocarbon liquids or natural gas: after processing and/or treatment in the producing operations, or from storage vessels or automatic transfer facilities or other such equipment, including product loading racks, to pipelines or any other forms of transportation. For the purposes of this subpart, the point at which such liquids or natural gas enters* a *natural gas processing plant is* a *point of custody transfer.*

Based on the definition of "custody transfer," one point of custody transfer occurs as the compressed natural gas from engines E01 through E04 enters the MarkWest processing plant. Another point of custody transfer occurs as the processed gas is transferred from the MarkWest facility back to the Kenova Compressor Station, and undergoes additional compression by engines E05 through E08. Emissions from such facilities are not to be aggregated for determining major source status; therefore, units E01 through E04 are aggregated separately from units E05 through E08. For each Kenova Compressor Station facility, total HAP emissions are below the 25-tpy major source threshold. Additionally, the aggregate of formaldehyde emissions from engines E01 through E04 and the aggregate from E05 through E08 are both below the 10-tpy threshold for a single HAP, resulting in the Station being a minor source of HAPs.

Tables 2-1 and 2-2 provide the potential emissions of nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC) sulfur dioxide (SO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 microns (PM_{10}), particulate matter with an aerodynamic diameter of less than or equal to 2.5 microns ($PM_{2.5}$), formaldehyde (CH_2O), and total HAPs. The Station is a minor source of

HAPs, as engines E01 through E04 and E05 through E08 must be aggregated separately when determining major source status as described above. Detailed emission calculations are provided in Attachment N. Emissions are based on source testing and AP-42 as specified in the tables contained in Attachment N. The source testing basis for the 2005 determination is included in Attachment D-2 (following this regulatory discussion). The ancillary facility equipment has been included on both Table 2-1 and Table 2-2 to show that the inclusion of these sources on either side of the facility does not impact the minor source determination. Emissions provided on these tables do not include any add-on controls which have been installed on the engines.

Table 2-1 Oil and Gas Production Facility Potential Annual Emissions (tpy)

Source	NO_x	CO	VOC	SO_2	PM_{10}/ $PM_{2.5}$	CH_2O	Total HAP
E01 – E04	886.5	39.2	35.32	0.21	14.2	7.95	15.1
G3	0.29	0.36	0.21	0.0008	0.01	0.06	0.09
H1	0.64	0.54	0.04	0.005	0.05	0.0005	0.01
BL2	2.71	2.27	0.15	0.02	0.21	0.002	0.05
Total	**890.2**	**42.4**	**35.7**	**0.24**	**14.5**	**8.01**	**15.3**

Table 2-2 Natural Gas Transmission and Storage Facility Potential Annual Emissions (tpy)[1]

Source	NO_x	CO	VOC	SO_2	PM_{10}/ $PM_{2.5}$	CH_2O	Total HAP
E05 – E08	451.5	759.9	6.05	0.15	3.97	1.45	3.89
G3	0.29	0.36	0.21	0.0008	0.01	0.06	0.09
H1	0.64	0.54	0.04	0.005	0.05	0.0005	0.01
BL2	2.71	2.27	0.15	0.02	0.21	0.002	0.05
Total	**455.1**	**763.1**	**6.44**	**0.17**	**4.23**	**1.52**	**4.03**

[1] PTE prior to reduction of emissions from installation of NSCR on engines E05-E08.

3.0 REGULATORY ANALYSIS AND COMPLIANCE METHODS

This section reviews the applicability of state and federal regulations potentially affecting the existing equipment and proposed compliance procedures. Supporting calculations are included in Attachment N.

3.1 National Emission Standards for Hazardous Air Pollutants

National Emission Standards for Hazardous Air Pollutants (NESHAPs) are promulgated under 40 CFR Part 63 for specific processes and HAP emissions. Through this modification, Kenova Compressor Station will be classified as a minor source of HAP emissions. The Station was previously erroneously classified as a major source of HAP emissions as described in Section 2.0.

3.1.1 Stationary Reciprocating Internal Combustion Engines (40 CFR 63 Subpart ZZZZ)

Subpart ZZZZ (Stationary Reciprocating Internal Combustion Engines) is applicable to the emergency generator and eight RICE. This section described the requirements of Subpart ZZZZ for these engines based on the HAP classification of the Station being corrected to minor. As existing RICE located at an area source, these engines are subject to the requirements provided in Table 2d to Subpart ZZZZ.

Emergency Generator (G3)

The applicable work practice standards, according to Table 2d, Item 5 are as follows:

- Change oil and filter every 500 hours of operation or annually, whichever comes first (or oil analysis at same frequency);
- Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

Columbia operates and maintains the RICE according to its own maintenance plan based on the manufacturer's maintenance recommendations. A non-resettable hour meter has been installed.

2-stroke, lean-burn RICE (E01 through E04)

The applicable work practice standards, according to Table 2d, Item 6 are as follows:

- Change oil and filter every 4,320 hours of operation or annually, whichever comes first (or oil analysis at same frequency);
- Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first, and replace as necessary; and
- Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary.

Columbia operates and maintains the RICE according to its own maintenance plan based on the manufacturer's maintenance recommendations.

4-stroke, rich-burn RICE (E05 through E08)

As specified in Table 2d, Item 12, Columbia has installed NSCR to reduce HAP emissions from these engines. An annual compliance demonstration, as specified in §63.6640(c), is required to show that the

average reduction of emissions of CO is 75% or more, the average CO concentration is less than or equal to 270 ppmvd at 15% O_2, or the average reduction of emissions of THC is 30% or more as specified in Table 5 Item 14 of Subpart ZZZZ.

In addition, Columbia automatically shuts down the engine if the catalyst inlet temperature exceeds 1250 °F.

A compliance report is submitted semiannually, outlining the results of the annual compliance demonstration.

3.1.2 Industrial, Commercial and Institutional Boilers and Process Heaters (40 CFR 63 Subparts DDDDD and JJJJJJ)

There are two NESHAPs which regulate emissions from industrial, commercial and institutional boilers – 40 CFR 63 Subpart DDDDD (major sources of HAPs) and 40 CFR 63 Subpart JJJJJJ (area sources of HAPs). As described above, the Station was inaccurately designated as a major source of HAPs during recent permitting actions. This led to the inclusion of Subpart DDDDD requirements for boilers BLR2. Based on the corrected designation to area source, Subpart DDDDD does not apply to the Station.

The Station is an area source of HAPs; Subpart JJJJJJ is the governing NESHAP for the Station. Per the regulation, natural gas-fired sources are exempt from the requirements of this Subpart. Therefore, there are no units subject to this Subpart.

3.2 Compliance Assurance Monitoring (40 CFR 64)

Compliance Assurance Monitoring (CAM) requirements in 40 CFR Part 64 are intended to assure that emission control equipment is properly operated and maintained. CAM applies to emissions units that:

1. have an emission limitation,
2. use a control device to comply with the emissions limit, and
3. have sufficient emissions to be classified as a major emission source under 40 CFR Parts 70.

As defined in Part 64, "control device" means add-on control equipment other than inherent process equipment that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere. The definition also states that "a control device does not include use of combustion or other process design features or characteristics."

Exemptions include units complying with an emission limitation or standard proposed by the USEPA after November 15, 1990 pursuant to Section 111 or 112 of the Clean Air Act (NSPS or NESHAP).

Engines E05 through E08 use add-on emission controls (NSCR) to comply with NESHAP Subpart ZZZZ requirements. This subpart was promulgated after 1990. As such, these engines are exempt from CAM requirements.

3.3 Permits for Modifications under West Virginia Air Regulation 13 (45 CSR 13)

There will be no change in emissions associated with this Project; therefore, PSD and NNSR requirements are not applicable. This document contains the information required by the minor NSR permitting program.

3.4 Requirements for Operating Permits (45 CSR 30)

After this Project, the Kenova Compressor Station will continue to be classified as a major source under Title V regulations. A minor modification application to revise the Station's Title V permit is being submitted to WVDAQ as part of the application package.

Attachment D-2

August 2005 WVDEP Determination

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone 304/926-0475 • FAX: 304/926-0479

Joe Manchin, III, Governor
Stephanie R. Timmermeyer, Cabinet Secretary
www.wvdep.org

August 10, 2005

Kelly Carmichael
Manager, EH&S
1700 MacCorkle Ave. SE
Charleston, WV 25325

RE: RICE MACT Applicability
Columbia Gas Transmission Corp.
Kenova Compressor Station
Permit Determination PD05-097
Plant ID No. 099-00014

Dear Mr. Carmichael:

It has been determined that the subject facility is not subject to 40 CFR 63 Subpart ZZZZ. This determination is based on information included with your submission dated July 6, 2005, and received on July 08, 2005 which indicates that neither the natural gas transmission and storage section of the facility nor the oil and gas production section of the facility (as defined in 40 CFR 63), when taken individually, emit over 10 tons per year of any individual Hazardous Air Pollutant nor 25 tons per year of all aggregated Hazardous Air Pollutants.

Please bear in mind, however, that any changes to the facility may nullify this determination and immediately subject said facility to the terms and condition of 45 CSR 63 Subpart ZZZZ.

Should you have any questions or comments, please contact me at (304) 926-0499 ext. 1218.

Sincerely,

Steven R. Pursley, PE
Engineer 3

PROGRAM FACILITY Kenova
FILE TYPE Air - Permit
FILE COPY

c: Kasey Gabbard, EH&S Coordinator

David_White@URSCorp.com

06/07/2005 09:29 AM

To: Kelly Carmichael/NCS/Enterprise@NiSource, Kasey Gabbard/NCS/Enterprise@NiSource

cc:

Subject: Re: RICE MACT Applicability

Below is an e-mail from Ray Chalmers at EPA regarding the major HAP source status of a facility such as Kenova where part of the equipment is associated with operations upstream of a gas processing plant and part are downstream. I was expecting to get a follow-up e-mail from him after he discussed the situation with EPA HQ. I called Ray this morning since I had not heard from him. He said he had talk to Greg Nizich and Maria Malave who are the primary EPA contacts related to HH and HHH. They agreed that emissions from equipment upstream and downstream of gas processing should not be combined to determine potential emissions and MACT applicability.

Let me know if you have any questions.

David M. White
URS/Morrisville, NC
Phone: 919-461-1318
FAX: 919-461-1415
email: david_white@urscorp.com

Chalmers.Ray@epamail.epa.gov

05/27/2005 04:33 PM

To: David_White@URSCorp.com

cc:

Subject: Re: RICE MACT Applicability

Dave:

I've reviewed your conclusions and my preliminary opinion is that they are consistent with the provisions you cite in the Reciprocating Internal Combustion Engine MACT, the Oil and Natural Gas Production MACT, and the Natural Gas Transmission and Storage MACT, assuming that your description of the source and its HAP emissions is comprehensive and accurate. Before giving a final opinion I plan to speak with the EPA HQ contact for the Oil and Natural Gas Production and the Natural Gas Transmission and Storage MACTs, who is more familiar with the special major source provisions in those MACTs. I will get back to you again after that discussion.

Ray Chalmers
US EPA Region III

1650 Arch Street
Philadelphia, PA 19103-2029
Phone: 215-814-2061
Fax: 215-814-2134
Email: chalmers.ray@epa.gov

David_White@URSC
orp.com

05/26/2005 03:19 PM

To: Ray Chalmers/R3/USEPA/US@EPA

cc:

Subject: RICE MACT Applicability

Please confirm my interpretation regarding the applicability of the RICE MACT rule (Subpart ZZZZ) to the following situation.

1. A compressor station under common ownership and control operates two sets of gas compression engines. One set compresses field gas. After compression, the gas is transported via pipeline to an off-site NGL extraction facility under separate ownership and control. After removal of NGL, the gas is returned via pipeline to the compressor station where it is further compressed by the second set of engines and piped to a gas transmission line. For the sake of discussion, assume that the formaldehyde PTE from each set of engines is 6 tpy and that there is a emergency generator at the station with a formaldehyde PTE of 1 tpy.

2. Based on the applicability criteria in Subparts HH (ONG Production) and HHH (Gas T&S), the first set of compressor engines is covered by Subpart HH (since they are upstream of a natural gas processing plant) and the second set of engines is covered by Subpart HHH. These two rules define these two sets of engines as being part of separate "facilities" and, based on the definition of "major source" contained in these two rules, the emissions from the Production facility and the T&S facility are not aggregated to determine applicability of these two MACT rules.

3. The definition of "major source" in the RICE MACT rule references the definition of "facility" in Subpart HHH and states [in subsection (4)] that emissions from a T&S facility shall not be aggregated with emissions from equipment that is not part of the same facility.

4. Based on the above, my interpretation is that under the Title V program
the station is a major source of HAP (13 tpy of formaldehyde). However, the
MACT rules classify the station as two separate facilities, neither of which are a "major source". As a result, the RICE MACT rule does not apply
to either facility.

Please contact me if you have any questions or need additional information.

David M. White
URS/Morrisville, NC
Phone: 919-461-1318
FAX: 919-461-1415
email: david_white@urscorp.com

Columbia Gas Transmission
A NiSource Company

RICE MACT APPLICABILITY DETERMINATION

KENOVA COMPRESSOR STATION
PLANT ID. 099-00014

COLUMBIA GAS TRANSMISSION CORPORATION
1700 MACCORKLE AVENUE SE
CHARLESTON, WV 25314

JULY 2005

Columbia Gas Transmission
A NiSource Company

1700 MacCorkle Ave SE
Charleston WV 25314-1273

304 357 2000

July 6, 2005

Bev McKeone, NSR Program Manager
WVDEP-Division of Air Quality
601 57th Street SE
Charleston, WV 25304

RE: Columbia Gas Transmission Corporation
Kenova Compressor Station Facility ID#099-00014
Applicability Determination for MACT Subpart ZZZZ

Dear Ms. McKeone:

Pursuant to recently conducted emission testing and discussions with your agency, Columbia Gas is submitting this request for an applicability determination under MACT 40 CFR 63 Subpart ZZZZ for the reciprocating internal combustion engines at our Kenova Compressor Station located in Wayne County.

Based on the definition of "major source" in 40 CFR §63.6675, Units 5 through 8 are part of a natural gas transmission and storage facility and not aggregated with other units including Units 1 through 4 or the adjacent MarkWest natural gas liquids processing facility. Subpart ZZZZ (and the prior Subpart HH and HHH MACT rules) states that emissions from these separate facilities are not aggregated to determine major source status and the applicability of Subpart ZZZZ. The attached test results show that Units 5 through 8, at worst-case conditions, have combined formaldehyde emissions less than 2 tons per year. Thus the facility is not a major source subject to Subpart ZZZZ. Additional information on the station and the regulatory basis for our interpretation of Subpart ZZZZ is provided in the attached documents. In addition to this applicability determination, we are also requesting an update of emissions related to the Waukesha generator (unit #020G3).

If you have any questions or comments, feel free to call myself at (219) 647-5312 or Kasey Gabbard at (304) 357-2079.

Sincerely,

Kelly Carmichael
Manager, EH&S
NiSource Inc.

Enclosure

Columbia Gas Transmission
A NiSource Company

RICE MACT APPLICABILITY DETERMINATION

KENOVA COMPRESSOR STATION
PLANT ID. 099-00014

COLUMBIA GAS TRANSMISSION CORPORATION
1700 MACCORKLE AVENUE SE
CHARLESTON, WV 25314

JULY 2005

Table of Contents

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
Phone: (304) 926-0475
www.wvdep.org

PERMIT DETERMINATION FORM (PDF)

FOR AGENCY USE ONLY: PLANT I.D. # _____

PDF # _____ PERMIT WRITER _____

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
Columbia Gas Transmission Corporation

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):
Kenova Compressor Station

3. STANDARD INDUSTRIAL CLASSIFICATION (SIC) CODE:
4922

4A. MAILING ADDRESS: 1700 MacCorkle Ave. SE
Charleston, WV 25325-1273

4B. PHYSICAL ADDRESS: Route 1 -P.O. Box 75
Kenova, WV 25530

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE MAP AS ATTACHMENT D):
From Charleston, Take I-64 West to US Route 52.The station is located approximately 2 miles South from the intersection of I-64 and US Route 52.

5B. NEAREST ROAD:	5C. NEAREST CITY OR TOWN:	5D. COUNTY:
Route 1	Kenova	Wayne
5E. UTM NORTHING (KM):	**5F. UTM EASTING (KM):**	**5G. UTM ZONE:**
4247.98	360.92	17

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED:	6B. TITLE:
Kasey Gabbard	EH&S Coordinator

6C. TELEPHONE:	6D. FAX:	6E. E-MAIL:
(304) 357-2079	(304) 357-2770	kgabbard@Nisource.com

7A. DAQ PLANT I.D. NO. (FOR AN EXISTING FACILITY ONLY):
099-00014

7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY):
R30-0990014-1996; R13-2251b

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST:
N/A

8A. TYPE OF EMISSION SOURCE (CHECK ONE):
☐ NEW SOURCE ☒ ADMINISTRATIVE UPDATE
☐ MODIFICATION ☒ OTHER (PLEASE EXPLAIN IN 11B)

8F. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?
☐ YES ☐ NO

9. IS *DEMOLITION* OR PHYSICAL *RENOVATION* AT AN EXISTING FACILITY INVOLVED? ☐ YES ☒ NO

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE:	10B. DATE OF ANTICIPATED START-UP:
/ASAP/	/ASAP/

11A. PLEASE PROVIDE A **DETAILED PROCESS FLOW DIAGRAM** SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS **ATTACHMENT D.**

12. PLEASE PROVIDE A **DETAILED PROCESS DESCRIPTION AS ATTACHMENT A.** Request for Determination of MACT applicability

13A. REGULATED AIR POLLUTANT EMISSIONS:

⇒ FOR A NEW FACILITY, PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.

⇒ FOR AN EXISTING FACILITY, PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.

PTE FOR A GIVEN POLLUTANT IS TYPICALLY BEFORE AIR POLLUTION CONTROL DEVICES AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM	0.00	0.00
PM_{10}	0.00	0.00
VOCs	0.00	0.00
CO	0.00	0.00
NO_x	0.00	0.00
SO_2	0.00	0.00
Pb	0.00	0.00
HAP- CH_2O (Generator #020G3)*	-0.07	-0.01
HAP- CH_2O (Units 5-8)**	0.34	1.47

* EMISSION CHANGE DUE TO REVISED EMISSION FACTOR DATA ** PTE with use of approved test report data-Attachment C

13B. PLEASE PROVIDE ALL SUPPORTING CALCULATIONS AS ATTACHMENT B.

CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (SHOWN IN YOUR DETAILED PROCESS FLOW DIAGRAM) FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAP'S (LISTED IN SECTION 112[b] OF THE 1990 CAAA), TAP'S (LISTED IN 45CSR27), AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, MINERAL ACIDS PER 45CSR7, ETC.).

14. CERTIFICATION OF DATA

I, MAVERICK L. BENTLEY (*TYPE NAME*) ATTEST THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR APPENDED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AND BELIEF AFTER REASONABLE INQUIRY, AND THAT I AM A *RESPONSIBLE OFFICIAL*** (*PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR*) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: Mark L Bentley

TITLE: MAVERICK L. BENTLEY DATE: 06/22/2005

** THE DEFINITION OF THE PHRASE '*RESPONSIBLE OFFICIAL*' CAN BE FOUND AT 45CSR13, SECTION 2.23.

NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:

☒ ATTACHMENT A ☒ ATTACHMENT B ☒ ATTACHMENT C ☒ ATTACHMENT D ☐ ATTACHMENT E

Description Emission Calcs Test Report Map/Plot Plan/PFD Supporting Documentation

RECORDS ON ALL CHANGES ARE REQUIRED TO BE KEPT AND MAINTAINED ON SITE FOR TWO (2) YEARS.

THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE.

BOOK 214 PAGE 304

State of West Virginia

CERTIFICATE

I, JOHN D. ROCKEFELLER IV Secretary of State of the State of West Virginia, hereby certify that

COLUMBIA GAS TRANSMISSION CORPORATION,

a corporation formed under the laws of the State of Delaware desiring to hold property and transact business in the State of West Virginia, has this day presented to me in my said office a duly certified copy of its Certificate of Incorporation, with all amendments and additions thereto, and has filed in my said office a writing, duly executed under its corporate seal, accepting the provisions of section seventy-nine of article one, chapter thirty-one of the Code of West Virginia and agreeing to be governed thereby.

WHEREFORE, I do declare that said corporation is duly authorized to hold property and transact business in the State of West Virginia.

Given under my hand and the Great Seal of the said State at the City of Charleston, this

TWENTY-SEVENTH day of

MAY, 19 71

John D. Rockefeller IV

Secretary of State.

ATTACHMENT A

PROCESS DESCRIPTION

MACT APPLICABILITY DOCUMENTATION

ATTACHMENT A

Columbia Gas Transmission
Kenova Compressor Station
RICE MACT Background Document

Background

This document provides background information regarding the applicability of the reciprocating internal combustion engine (RICE) MACT rule in Subpart ZZZZ of 40 CFR 63 to Columbia Gas Transmission Company's Kenova Compressor Station. Columbia operates eight natural gas-fired compressor engines at Kenova Compressor Station. Units 1 through 4 are Cooper-Bessemer GMWA-8 lean burn engines with a rated output of 2,000 horsepower (HP) each. Units 5 through 8 are Ingersoll-Rand 410 KVG four-stroke rich burn engines with a rated output of 1,100 HP each. Units 1 through 4 compress natural gas for delivery to the separately owned and operated MarkWest natural gas liquids (NGL) processing facility. Units 5 through 8 compress the residual natural gas (after removal of NGL) for transmission via Columbia's interstate pipeline system (see Attachment D).

These engines have all individually been tested for formaldehyde recently on two occasions. The most recent being on March 23-24, 2005 under WVDAQ approved protocol. In addition, Columbia met with WV DAQ on April 21, 2005 to discuss the test results. Based on the test results, Units 1 through 4 at worst-case conditions had combined formaldehyde emissions less than 9 tons per year. Units 5 through 8 at worst-case conditions had combined formaldehyde emissions less than 2 tons per year. We believe that this testing reflects the potential to emit for these units.

Process Description

Natural gas that is compressed at the Kenova Compressor Station originates from nearby production wells and is fed to the station through Lines P and BM-74. As documented by individual metering points that tie into these lines, there are a number of locations where gas is received, noted as DWA, TOMH, WAL, INZ, BOLS, BCLS, BCKS, KNLS and P13. The breakdown by specific meter measuring points for each of these locations is properly documented in the Annual FERC Report. These meter descriptions are measuring points of natural gas well production (positive volumes are receipts into the system) and include Kentucky-West Virginia Beaver Creek, Tomahawk, and Dwale. Other sources of natural gas is received at points on the suction side of the Horse Creek, Hubball, Nye, Inez, Boldman, Walbridge, and Kermit stations. Natural gas is received at Kenova on the suction side of Units 1 through 4. The engines compress the gas prior to delivery to the MarkWest NGL facility. The actual point of custody transfer takes place at the meter measuring station located directly behind (NNW) the

Columbia Kenova office building. This point of transfer is identified on the Columbia Kenova plot plan (Attachment D). The MarkWest facility extracts propane and heavy hydrocarbons from the incoming natural gas through a series of dehydrators, cryogenic recovery units and molecular sieves. When MarkWest has finished the NGL extraction process, the custody of the natural gas is then transferred back to Columbia's Kenova Compressor Station for additional compression to pipeline pressure with Units 5 through 8. The custody transfer between Columbia and MarkWest is an integral part of the operations agreement entered into between the two corporations and is punctuated by the details of this agreement with binding operational conditions.

MACT Applicability

The recently promulgated RICE MACT applies to engines located at major sources of hazardous air pollutants (HAPs). The term "major source" is defined in Section 112(a)(1) of the 1990 Clean Air Act Amendments (CAAA) and in 40 CFR §63.2 as a source that has the potential to emit 10 tons per year or more of any single HAP or 25 tons per year or more of any combination of HAPs. However, Section 112(n)(4)(A) of the 1990 CAAA supplements the major source definition for oil and gas production operations and pipelines with the following:

> *(4) Oil and gas wells; pipeline facilities.-*
> *(A) Notwithstanding the provisions of subsection (a), emissions from any oil or gas exploration or production well (with its associated equipment) and emissions from any pipeline compressor or pump station shall not be aggregated with emissions from other similar units, whether or not such units are in a contiguous area or under common control, to determine whether such units or stations are major sources, and in the case of any oil or gas exploration or production well (with its associated equipment), such emissions shall not be aggregated for any purpose under this section.*

USEPA implemented 112(n)(4)(A) by defining "major source" for the RICE MACT in 40 CFR §63.6675 as follows:

> *Major Source, as used in this subpart, shall have the same meaning as in §63.2, except that:*
>
> *(1) Emissions from any oil or gas exploration or production well (with its associated equipment (as defined in this section)) and emissions from any pipeline compressor station or pump station shall not be aggregated with emissions from other similar units, to determine whether such emission points or stations are major sources, even when emission points are in a contiguous area or under common control;*
>
> *(2) For oil and gas production facilities, emissions from processes, operations, or equipment that are not part of the same oil and gas production facility, as defined in §63.1271 of subpart HHH of this part, shall not be aggregated;*

(3) For production field facilities, only HAP emissions from glycol dehydration units, storage vessel with the potential for flash emissions, combustion turbines and reciprocating internal combustion engines shall be aggregated for a major source determination; and

(4) Emissions from processes, operations, and equipment that are not part of the same natural gas transmission and storage facility, as defined in §63.1271 of subpart HHH of this part, shall not be aggregated.

A key element of this definition is the term "facility" as defined in §63.1271 (see below) and the associated differentiation of oil and gas production facilities versus natural gas transmission facilities in §63.1270. As discussed in §63.1270 and §63.1271, equipment located at a single site prior to custody transfer or a natural gas processing plant is classified as oil and gas production facility, while equipment located at a single site downstream of an oil and gas production facility is classified as a transmission and storage facility. As stated in the above definition of major source in the RICE MACT rule, emissions that are not part of the same facility are not to be aggregated for the determining major source status.

EPA defined a natural gas transmission and storage "facility" in §63.1271 as:

Facility means any grouping of equipment where natural gas is processed, compressed, or stored prior to entering a pipeline to a local distribution company or (if there is no local distribution company) to a final end user. Examples of a facility for this source category are: an underground natural gas storage operation; or a natural gas compressor station that receives natural gas via pipeline, from an underground natural gas storage operation, or from a natural gas processing plant. The emission points associated with these phases include, but are not limited to, process vents. Processes that may have vents include, but are not limited to, dehydration and compressor station engines.

Facility, for the purpose of a major source determination, means natural gas transmission and storage equipment that is located inside the boundaries of an individual surface site (as defined in this section) and is connected by ancillary equipment, such as gas flow lines or power lines. Equipment that is part of a facility will typically be located within close proximity to other equipment located at the same facility. Natural gas transmission and storage equipment or groupings of equipment located on different gas leases, mineral fee tracts, lease tracts, subsurface unit areas, surface fee tracts, or surface lease tracts shall not be considered part of the same facility.

And EPA defined an "oil and gas production facility" in §63.6675 as,

Oil and gas production facility as used in this subpart means any grouping of equipment where hydrocarbon liquids are processed, upgraded (i.e., remove impurities or other constituents to meet contract specifications), or stored prior to the point of custody transfer; or where natural gas is processed, upgraded, or stored prior to entering the natural gas transmission and storage source category. For purposes of a major source determination, facility (including a building, structure, or installation) means oil and natural gas production and processing equipment that is located within the boundaries of an individual surface site as defined in this section. Equipment that is part of a facility will typically be located within close proximity to other equipment located at the same facility. Pieces of production equipment or groupings of equipment located on different oil and

gas leases, mineral fee tracts, lease tracts, subsurface or surface unit areas, surface fee tracts, surface lease tracts, or separate surface sites, whether or not connected by a road, waterway, power line or pipeline, shall not be considered part of the same facility. Examples of facilities in the oil and natural gas production source category include, but are not limited to, well sites, satellite tank batteries, central tank batteries, a compressor station that transports natural gas to a natural gas processing plant, and natural gas processing plants.

And custody transfer in §63.6675 as,

Custody transfer means the transfer of hydrocarbon liquids or natural gas: after processing and/or treatment in the producing operations, or from storage vessels or automatic transfer facilities or other such equipment, including product loading racks, to pipelines or any other forms of transportation. For the purposes of this subpart, the point at which such liquids or natural gas enters a natural gas processing plant is a point of custody transfer.

EPA lists one point of "custody transfer" to be "...after processing..." which would separate MarkWest from Units 5 through 8.

Because emissions from facilities are not to be aggregated for determining "major source" status under Subpart ZZZZ, Units 5 through 8 are not aggregated with any other facilities or units. As such, Units 5 through 8 do not have a HAP PTE exceeding the individual 10 tpy or aggregated 25 tpy thresholds (supporting data and calculations are provided in Attachment C). It is our conclusion that Units 5 through 8 are not subject to Subpart ZZZZ.

Units 1 through 4 are existing lean burn engines and thus exempt from the RICE MACT requirements. However, we believe that in addition to being exempt, Units 1 through 4 are a minor source and are aggregated separately from Units 5 through 8 and from MarkWest as well under the definition of "custody transfer" which also includes "...the point at which...natural gas enters a natural gas processing plant..."

Requests for Determination

We request your concurrence on two points:

1. Our interpretation that Units 5 through 8 are considered a separate facility for purposes of determining "major source" under the RICE MACT.
2. Based on available information and testing submitted to WV DAQ on April 21, 2005 and approved of on June 6, 2005, Units 5 through 8 do not have a potential to emit of greater than 10 tons per year of formaldehyde. During the emission test, detailed parametric testing was conducted to achieve the highest possible formaldehyde emissions.

As a result of the aforementioned scenario interpretation, with any single HAP not exceeding 10 tons per year and total HAPs not exceeding 25 tons per year, 40 CFR 63 Subpart ZZZZ does not apply either to Units 1 through 4 or Units 5 through 8.

Enforceable Conditions

Units 1 through 4 are exempt from the RICE MACT requirements (whether major or minor) because the engines are not existing 4 stroke rich burn engines greater than 500 HP. Enforceable conditions are not needed.

The maximum tested formaldehyde emissions from Units 5 through 8 (potential to emit) individually or combined are much less than 10 tpy. As such, Columbia does not believe that a permit modification to implement an enforceable condition is necessary to confirm that these engines are exempt from Subpart ZZZZ, but we would like to discuss this further with WV DAQ.

ATTACHMENT B

SUPPORTING EMISSION CALCULATIONS

Columbia Gas Transmission
Kenova Compressor Station
MACT Applicability

Attachment B.1
Emissions Summary (Units 5-8 & misc. equip.)

Pollutant	Potential TPY[1]
CH2O	**1.47**
Acetyldehyde	0.58
Benzene	0.32
Ethylbenzene	0.01
Hexane	0.02
Toluene	0.11
Xylene	0.04
Total HAP's TPY	**2.55**

[1] *PTE calculations include (4) Ingersoll-Rand, 4-stroke rich burn units and additional smaller sources (generator-boiler-heater).*

Attachment B.2 Formaldehyde Support Calculations

	Manufacturer & Model	HP		lb/hr	hr/yr	CH_2O Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100		0.08	8760	0.35
#02006	Ingersoll-Rand 410 KVG-10	1100		0.08	8760	0.35
#02007	Ingersoll-Rand 410 KVG-10	1100		0.08	8760	0.35
#02008	Ingersoll-Rand 410 KVG-10	1100		0.08	8760	0.35
#020G3	Waukesha VGF-H24GL	500		0.21	500	0.05
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.00007	0.00002	8760	0.0001
HTR1	Line Heater	1.5	0.00007	0.00011	8760	0.0005
				TOTAL		1.47

Attachment B.3 Acetaldehyde Support Calculations

Unit ID	Manufacturer's Model	HP	g/hp-hr	lb/hr	hr/yr	Acetaldehyde Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100	0.013	0.03	8760	0.14
#02006	Ingersoll-Rand 410 KVG-10	1100	0.013	0.03	8760	0.14
#02007	Ingersoll-Rand 410 KVG-10	1100	0.013	0.03	8760	0.14
#02008	Ingersoll-Rand 410 KVG-10	1100	0.013	0.03	8760	0.14
#020G3	Waukesha VGF-H24GL	500	0.036	0.04	500	0.01
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.00000	0.00000	8760	0.0000
HTR1	Line Heater	1.5	0.00000	0.00000	8760	0.0000
TOTAL						**0.58**

Attachment B.4 Benzene Support Calculations

Unit ID	Manufacturer & Model	HP	g/hp-hr	lb/hr	hr/yr	Benzene Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100	0.008	0.02	8760	0.08
#02006	Ingersoll-Rand 410 KVG-10	1100	0.008	0.02	8760	0.08
#02007	Ingersoll-Rand 410 KVG-10	1100	0.008	0.02	8760	0.08
#02008	Ingersoll-Rand 410 KVG-10	1100	0.008	0.02	8760	0.08
#020G3	Waukesha VGF-H24GL	500	0.002	0.00	500	0.00
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.000002	0.00000	8760	0.0000
HTR1	Line Heater	1.5	0.000002	0.00000	8760	0.0000
TOTAL						**0.32**

Attachment B.5 Ethylbenzene Support Calculations

Unit ID	Manufacturer & Model	HP	g/hp-hr	lb/hr	hr/yr	Ethylbenzene Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100	0.0001	0.00	8760	0.001
#02006	Ingersoll-Rand 410 KVG-10	1100	0.0001	0.00	8760	0.001
#02007	Ingersoll-Rand 410 KVG-10	1100	0.0001	0.00	8760	0.001
#02008	Ingersoll-Rand 410 KVG-10	1100	0.0001	0.00	8760	0.001
#020G3	Waukesha VGF-H24GL	500	0.0017	0.00	500	0.000
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.00000	0.00000	8760	0.0000
HTR1	Line Heater	1.5	0.00000	0.00000	8760	0.0000
TOTAL						**0.006**

Attachment B.6 Hexane Support Calculations

Unit ID	Manufacturer & Model	HP	g/hp-hr	lb/hr	hr/yr	Hexane Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100	0.0000	0.00	8760	0.000
#02006	Ingersoll-Rand 410 KVG-10	1100	0.0000	0.00	8760	0.000
#02007	Ingersoll-Rand 410 KVG-10	1100	0.0000	0.00	8760	0.000
#02008	Ingersoll-Rand 410 KVG-10	1100	0.0000	0.00	8760	0.000
#020G3	Waukesha VGF-H24GL	500	0.0048	0.01	500	0.001
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.002	0.00049	8760	0.002
HTR1	Line Heater	1.5	0.002	0.00265	8760	0.012
TOTAL						**0.015**

Attachment B.7 Toluene Support Calculations

Unit ID	Manufacturer & Model	HP	g/hp-hr	lb/hr	hr/yr	Toluene Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100	0.0027	0.01	8760	0.028
#02006	Ingersoll-Rand 410 KVG-10	1100	0.0027	0.01	8760	0.028
#02007	Ingersoll-Rand 410 KVG-10	1100	0.0027	0.01	8760	0.028
#02008	Ingersoll-Rand 410 KVG-10	1100	0.0027	0.01	8760	0.028
#020G3	Waukesha VGF-H24GL	500	0.0018	0.00	500	0.000
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.000003	0.00000	8760	0.00000
HTR1	Line Heater	1.5	0.000003	0.00001	8760	0.00002
TOTAL						**0.114**

Attachment B.8 Xylene Support Calculations

Unit ID	Manufacturer & Model	HP	g/hp-hr	lb/hr	hr/yr	Toluene Potential TPY
#02005	Ingersoll-Rand 410 KVG-10	1100	0.0009	0.00	8760	0.010
#02006	Ingersoll-Rand 410 KVG-10	1100	0.0009	0.00	8760	0.010
#02007	Ingersoll-Rand 410 KVG-10	1100	0.0009	0.00	8760	0.010
#02008	Ingersoll-Rand 410 KVG-10	1100	0.0009	0.00	8760	0.010
#020G3	Waukesha VGF-H24GL	500	0.0008	0.00	500	0.000
		MMBtu/hr	lb/MMBtu			
BLR1	Kewanee Boiler	0.275	0.000	0.000	8760	0.000
HTR1	Line Heater	1.5	0.000	0.000	8760	0.000
TOTAL						**0.040**

ATTACHMENT C

MARCH 2005 EMISSION TEST REPORT

EMISSIONS TEST REPORT FOR NATURAL-GAS FIRED ENGINES

Columbia Gas Transmission
A NiSource Company

Kenova Compressor Station

Presentation & Interpretation of Formaldehyde (CH_2O) Emissions Data
Collected on March 23-24, 2005

Prepared by:
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April 2005

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1.0 Summary

1.1 Introduction

Columbia Gas Transmission Corporation operates eight natural gas-fired compressor engines at its Kenova Station. If the station is classified as a major hazardous air pollutant (HAP) source as defined in Title 40, Part 63 of the U.S. Code of Federal Regulations (40 CFR 63), the four rich-burn compressor engines at the station would be subject to the federal maximum achievable control technology (MACT) requirements promulgated in June 2004 under Subpart ZZZZ of 40 CFR 63 for internal combustion engines. For Kenova Station, the key question is whether the station's annual potential to emit (PTE) for formaldehyde equals or exceeds the major source threshold of 10 tons per year (tpy).

To help determine whether Kenova Station is a major HAP source, Columbia contracted with URS Corporation to conduct emissions testing at the station. This testing was conducted on March 23-24, 2004 and included testing of the eight compressor engines at the station. A description of the engines, engine operating conditions during the testing, and test procedures are provided in Sections 2.0 and 3.0 of this report. An assessment of the test data is provided in Section 4.0. The data collected during the testing and associated quality assurance and quality control (QA/QC) procedures are provided in the appendices.

1.2 Key Test Results

Formaldehyde emissions from natural gas-fired engines result from incomplete combustion of methane and vary with in-cylinder residence time, exhaust temperature, air/fuel mixing, and availability of oxygen. The following conclusions are based on analysis of the formaldehyde and engine operating data collected at Kenova during testing of the two-stroke, lean-burn GMWA engines and the four-stroke, rich-burn KVG engines.

1.2.1 GMWA Engines (Engines 1-4)

- Formaldehyde emissions from the four GMWA engines ranged from 0.019 to 0.027 lb/MMBtu during full-load operation, and averaged 0.023 lb/MMBtu.
- Operation at reduced torque and full speed lowered the exhaust manifold temperature and increased formaldehyde emissions by ~50% compared to full-load operation.
- The AP-42 emission factor for 2-stroke, lean-burn engines of 0.0552 lb/MMBtu is based on data from a wide range of engine models; individual test measurements from these engines range from 0.0055 to 0.16 lb/MMBtu. The EPA database used to develop AP-42 includes test data from a GMWA engine. At full-load, formaldehyde emissions from that engine were 0.027 lb/MMBtu, which is similar to the Kenova test data at similar operating conditions.

1.2.2 KVG Engines (Engines 5-8)

- Formaldehyde emissions from the four KVG engines during rich-burn operation (as indicated by elevated carbon monoxide) ranged from 0.0034 to 0.0071 lb/MMBtu during full-load operation, and averaged 0.0052 lb/MMBtu.

- Operation at reduced torque and full speed had little impact on formaldehyde emissions. However, operation of the engine at reduced speed lowered the exhaust manifold temperature and increased the formaldehyde emission rate by ~15%.
- Adjusting the engine carburetor to result in a slightly lean air/fuel ratio resulted in lower CO emissions, but roughly doubled the formaldehyde emission rate.
- The AP-42 emission factor for 4-stroke, rich-burn engines of 0.0205 lb/MMBtu is based on data from engines that are designed for rich-burn operation, rather than on how they were actually operating. The only data in the AP-42 data set that were collected during actual rich-burn operation and are of similar design to the Kenova engines indicate formaldehyde emissions of 0.0047 and 0.0050 lb/MMBtu, which is similar to the Kenova engines.

2.0 Source Description and Test Matrix

2.1 Source Description

There are eight internal combustion engines at Kenova Station that are used to compress natural gas. Engines 1 thru 4 are two-stroke, lean-burn, Cooper GMWA-8 engines rated at 2,000 hp each. Engines 5 thru 8 are four-stroke, rich-burn, Ingersoll-Rand 410-KVG engines rated at 1,100 hp each. Engines 1 thru 4 compress natural gas produced from surrounding wells and normally operate at 90 to 100% of rated torque and full speed. Engines 5 thru 8 further compress this gas after most of the propane and heavier hydrocarbons have been removed by an adjacent natural gas liquids recovery plant. Engines 5 thru 8 operate at varying torque and speed depending on the operating pressure of the downstream gas transmission pipeline. All eight engines are generally in continuous operation except for maintenance outages. None of the engines are equipped with intake air cooling systems.

As defined in Section 63.6590 of the Subpart ZZZZ, four-stroke, rich-burn engines with a site-rating of more than 500 hp are subject to the requirements are in Subpart ZZZZ unless they are used only for emergencies. Existing, two-stroke, lean-burn engines are exempt from the MACT rules, but must be considered in determining whether the station is a major HAP source.

2.2 Test Matrix

The objective of the testing was to determine formaldehyde emissions from the engines. For these measurements, U.S. EPA Conditional Test Method 323 was used. As part of this testing, engine operating parameters and stack concentrations of carbon monoxide (CO), oxygen (O_2), and carbon dioxide (CO_2) were also recorded. For these additional exhaust gas measurements, continuous emissions monitor (CEM) instrumentation operated in accordance with the procedures in Appendix A of 40 CFR 60 were used. Additional information on these methods is provided in Section 3 of this report.

The testing included collection of emissions and engine operating data from all eight engines while they were operating at near rated torque and speed. Additional testing was also conducted on one engine of each model to document the impact of changes in engine torque on emissions. Because the four rich-burn engines operate at varying speeds and can operate at slightly lean air/fuel ratio, the testing of this engine was also conducted at low speed and a slightly lean air/fuel ratio.

During each test, emissions sampling was conducted for approximately one hour during which three Method 323 samples were collected (~20 minutes of run time per sample). CEM measurements were recorded at one-minute intervals and averaged over the hour. Other data collected during these tests included engine speed (rpm), hp, fuel flow, intake and exhaust manifold temperatures, intake manifold pressure, and ignition timing; compressor suction and discharge pressure and load step; and ambient temperature, pressure, and relative humidity. Engine and compressor operating data was manually collected once every 15 minutes during each test. Atmospheric conditions were recorded once during each test and checked against weather data from the Huntington, West Virginia airport.

Mass emission rates (lb/hr, lb/MMBtu, and g/hp-hr) were determined using EPA Method 19 and fuel composition information provided by Columbia during each testing day.

3.0 Sampling And Analysis Procedures

3.1 Sampling System

An extractive sampling system was used to recover exhaust gas samples for determination of formaldehyde, CO, O_2 and CO_2. Exhaust gas was withdrawn continuously from near the centerline exhaust duct using a stainless steel probe and transferred through a heated Teflon line to a heated distribution manifold. Heated line and manifold temperatures were monitored and maintained above 212 °F throughout the testing period to prevent moisture condensation.

The sample was split with some of the sample continuing in a heated line to the formaldehyde sampling train. The rest of the gas sample entered a condenser-style gas conditioning system to remove moisture. The conditioning system removes moisture from the sample by lowering the temperature of the gas to 35 °F. Following the gas conditioner, the flue gas stream was split to the various analyzers using a manifold. This system operates under positive pressure to eliminate the possibility of air infiltration through a leak.

The data acquisition system (DAS) for the CEM system consists of a data logger and a desktop computer. The data logger scans the instrument output and logs digitized voltages. A computer program is used to translate the digitized voltages into relevant concentrations in engineering units (ppmvd, %V, etc.). The computer program has several modes of operation: calibration, data acquisition, data reduction, data view, data edit, and data import.

During each test run, one-minute averages of each gas concentration were recorded. Instrument calibration data were also recorded. At the end of the test run, the test run average was generated and system bias checks were performed.

3.2 Formaldehyde

The concentrations of formaldehyde were determined for each run using EPA Draft Method 323. This method uses a midget impinger train containing chilled water to collect formaldehyde in the stack gas. Each test run sample was drawn through the sampling train from the heated sampling manifold at a nominal sampling rate of 0.3 liters per minute over a period of 20 minutes. Three samples were collected for each engine test run. Each sample had a total sample volume of approximately 6 liters.

The flue gas samples were collected through the same heat-traced sample line that was shared with the CEM monitoring system. All sample line connections were insulated, and gas temperatures at the sampling point were monitored continuously throughout the test period to ensure that the sample temperature was maintained at >212 °F.

The impinger samples were analyzed on-site within 2 hours of sampling using the acetylacetone procedure described in Draft Method 323. In this procedure, acetylacetone reagent is added to an aliquot of the sample in the presence of ammonium acetate. The reaction product has a yellow color, the intensity of which is proportional to the formaldehyde concentration in the sample. The color intensity was measured spectrophotometrically at a wavelength of 412 nm.

Sampling and analytical QA/QC specifications for Draft Method 323 are shown in Table 3-1, along with the specific results during testing. All analytical standards, field duplicates, and replicates met required specifications. All field sampling and analytical information is contained in Appendices A and B.

Table 3-1. QA/QC Specifications for Formaldehyde Sampling and Analysis

Specification	Requirement	Frequency	Result
Leak-check	<2% of sampling rate	Pre-and post-sampling	0.0 l/min for all samples
Sample flow rate	0.2-0.4 l/min	Throughout Sampling	0.24-0.56 l/min [a]
VOA vial headspace	No headspace	After sample recovery	No headspace
Sample preservation	Maintain on ice	After sample recovery	Maintained on ice
Sample hold times	14 day maximum	After sample recovery	Analyzed with 2 hrs
Field duplicates	Original and duplicate sample within 20% of mean	One duplicate per source sample set	0.1-10.8%
Spiked sample [b]	Recovery between 80 and 120%	One spike per source sample set	92-101%
Field blank	<50% of lowest calibration standard	One blank per source sample set	≤16% of lowest standard
Calibration linearity	Correlation coefficient of 0.99 or higher	Per source sample set	$R^2 \geq 0.9998$
Calibration check standard	Within 10% of theoretical value	One calibration check per source sample set	94-107%
Lab duplicates	Original and duplicate analyses within 10% of mean	I duplicate per 10 samples	0.8-8.7%
Analytical blanks	<50% of lowest calibration standard	One blank per source sample set	Same as field blanks [c]

[a] One sample exceeded 0.4 l/min (0.56 l/min). All other samples ranged from 0.24 – 0.39 l/min.
[b] MS/MSD pairs were analyzed for each spiked sample.
[c] All field blanks were <50% of the lowest calibration standard, and were used as analytical blanks for source sample sets. Separate analytical blanks were prepared for calibration curves.

Four of the samples were sent to an independent laboratory for re-analysis as an additional quality assurance measure. Results of the on-site and QA analyses are compared in Table 3-2. The QA analyses averaged 20% lower than the on-site analyses. Review of sample handling procedures indicated that the samples were refrigerated until delivery to the independent laboratory. However, sample analysis did not occur until 14-15 days after sample collection, which is at the upper end of the specified hold times and may have resulted in partial loss of formaldehyde from the samples prior to analysis by the independent laboratory.

Table 3-2. Independent QA Analysis of Selected Formaldehyde Samples

Sample #	On-site Analysis (µg/ml)	QA Analysis (µg/ml)	Relative Difference (%)
Engine 1 Run 2	3.95	3.45	-14%
Engine 3 Run 6	1.85	1.51	-20%
Engine 6 Run 2	1.94	1.30	-40%
Engine 7 Run 5	0.83	0.77	-8%
Average Relative Difference			-20%

3.3 CO, O_2 and CO_2

EPA Methods 3A and 10 were used to determine concentrations of O_2/CO_2, and CO. Direct calibration and system bias calibration checks were performed to conform to EPA test methodology. All calibration gas concentrations were certified by EPA Protocol 1 procedures.

A Servomex Model 1400 series gas analyzer was used to measure concentrations of CO_2 by non-dispersive infrared (NDIR) absorption and O_2 by the paramagnetic principle. Gas filter correlation NDIR Thermo Environmental Model 48 analyzer was used for CO.

Specific quality assurance and quality control (QA/QC) procedures required by the EPA reference methods were followed during this test program to ensure the production of useful and valid data. The QA/QC checks and procedures described in this section are an integral part of the overall sampling scheme. All testing met or exceeded prescribed acceptance criteria.

The data quality criteria for the continuous emission monitors are summarized in Table 3-3. The primary control check for these monitors is daily analysis of control standards. The control standards were used to calibrate the instruments at the beginning and end of each day. The control standards were introduced upstream of the sample conditioning system for the calibration bias and drift checks and directly to the sampling manifold for the calibration error checks. Monitor calibration records and calibration gas certificates are provided in Appendix C.

Table 3-3. Calibration and Drift Check Criteria

Criteria	Control Limits	Corrective Action
Linearity Multipoint Cal Error	±2% of span value	Adjust instrument, redo multipoint
Daily Drift (zero and span)	±3.0% of span	Data not adjusted for drift
Sampling System Bias	±5% of span	Check heat trace and/or clean line
Response Time	Less than 2 minutes	Increase sample flow rate
Line Leak Check	<0.5% O_2	Locate and repair leak

Analyzer calibration and linearity checks were performed once each test day. After calibration adjustments were made to the analyzers, zero, mid-range, and high-range gases were introduced to the analyzers. During these checks, no adjustments were made to the system other than to maintain even flow rates. The analyzer calibration error check was considered valid if the gas concentration recorded by the DAS for any of the calibration gases did not exceed 2 percent of the span. CO, CO_2 and O_2 calibration gases were injected directly into the analyzer.

Before and after each test run, zero and upper-level span gases were introduced into the sampling system at the probe connection. Drift for each test was determined using the results of the pretest and post-test calibration checks. Drift was within 3% of the span value for each test run.

Leak checks verify that no ambient air is infiltrating the measurement system. The acceptance criterion was an O_2 response to a zero gas of less than 0.5% O_2. All leak checks performed met this criterion. A secondary leak check was performed on the entire system by blocking the end of the probe and pulling a vacuum on the line. An in-line flow meter was then used to verify the absence of flow through the system

Records of daily leak checks, sample line bias checks and response time checks are in Appendix C.

4.0 Data Presentation and Analysis

This section reviews the chemistry associated with formaldehyde production and destruction in natural gas-fired engines (Section 4.1) and presents the test results for the lean-burn GMWA engines (Section 4.2) and the rich-burn KVG engines (Section 4.3). The discussion of formaldehyde chemistry is provided to aid in interpretation of the test results for the two engine models.

4.1 Formaldehyde Chemistry

Formaldehyde is a product of incomplete combustion (PIC) that is formed during combustion of natural gas, primarily through the oxidation of methane (the primary constituent in natural gas).[1] This process involves the decomposition of methane (CH_4) to methyl radicals (CH_3), which in turn react to form formaldehyde (CH_2O) by one of several pathways depending on the local temperatures and the availability of oxygen. In lean-burn engines where significant oxygen is available, the main pathway is the reaction of methyl radicals with oxygen and hydroxyl radicals:

$$CH_3 + O \rightarrow CH_2O + H$$

$$CH_3 + OH \rightarrow CH_2O + H_2$$

In rich-burn engines with very little available oxygen, the primary formaldehyde pathway involves formation of ethene (C_2H_4) from methyl radicals or ethane (C_2H_6, which is naturally present in natural gas). Ethene then reacts to form formaldehyde via decomposition to methylene (CH_2) followed by oxidation by O and OH radicals, or via several other possible pathways:

$$CH_2 + O \rightarrow CH_2O$$

$$CH_2 + OH \rightarrow CH_2O + H$$

Most of the formaldehyde formed by these reactions is consumed during the combustion process by further reactions with O, OH, and H radicals to produce formyl radicals (HCO), which further react to form carbon monoxide (CO), carbon dioxide (CO_2), and water (H_2O).

Critical to all of these reactions are reaction time, temperature, and turbulence (referred to as the "3 T's") and the availability of oxygen at the molecular level. For example, in fuel-injected engines, there are localized areas within the cylinder that can be fuel-rich, fuel-lean, or near stoichiometric. How rich or lean these individual areas are will determine the availability of individual reaction species and localized temperatures, which will in turn define the speed at which reactions occur.

In a cylinder where fuel and air are well mixed, localized temperatures will be relatively uniform except for heat transfer loses to the cylinder walls and in cylinder crevices. However, because some engines have relatively low fuel injection pressures, there is insufficient momentum in the fuel to achieve thorough fuel/air mixing. This can result in significant localized areas of excess fuel or air that restrict combustion reactions from proceeding to completion. For example, if a

[1] Shareef, G.S., et. al., Measurement of Air Toxic Emissions from Natural Gas-Fired Internal Combustion Engines at Natural Gas Transmission and Storage Facilities (GRI-96/0009.1). Gas Research Institute, Chicago, Illinois, February 1996.

localized area has insufficient fuel, combustion reactions will proceed slowly and temperatures will be too low for rapid decomposition of formaldehyde to occur. Some of the key engine design and operating variables and how they affect engine operation relative to formaldehyde emissions are provided below:

- Air/fuel ratio – Affects relative concentrations of air and fuel within the cylinder and the average combustion zone temperature. AFR can be expressed as either the "trapped" ratio that occurs within the engine cylinder during the combustion process or the "total" ratio that includes the volume of air used to eject or scavenge combustion products from the cylinder after the intake and exhaust ports have opened.[2] Increasing AFR reduces cylinder temperatures, slows formaldehyde reactions, and increases emissions.

- Air/fuel mixing – The extent of air/fuel mixing prior to combustion depends on injection system design and fuel injection pressure. Localized variations (stratification) of air and fuel within the cylinder will determine actual combustion reactions and localized combustion zone temperatures. Incomplete mixing results in localized "cold" spots and increased formaldehyde emissions.

- Torque – Affects fuel input requirements, cylinder operating pressures and temperatures, and AFR. Operation at reduced torque reduces cylinder operating pressures, temperatures, and AFR, resulting in higher formaldehyde concentrations.

- Speed – Affects "total" AFR and time available for combustion reactions in the "trapped" cylinder volume. Reducing engine speed increases total AFR due to increased flow of scavenging air and increases time available for combustion reactions to occur. Speed also affects trapped AFR, but not as much as total AFR.

- Ignition Timing – Affects maximum cylinder pressure and temperature, and the amount of time available for combustion reactions. Advancing ignition timing increases maximum cylinder pressure and temperature and allows more time for combustion reactions to occur.

Changes in ambient conditions can also affect formaldehyde emissions from some engines, especially engines that do not have turbochargers and are not equipped with intercoolers for controlling air manifold temperature. With such engines, increases in ambient temperature will reduce AFR (due to the decrease in air density) and increase air intake manifold temperature. These changes will generally result in higher cylinder operating temperatures and lower formaldehyde emissions.

Factors that influence the efficient combustion of hydrocarbons have a generally similar impact on emissions of formaldehyde. As a result, it is sometimes possible to compare formaldehyde emission rates to emission rates of total hydrocarbons (THC) for similar engine types.[3] However, because of differences in reaction kinetics, this is not a direct relationship and it is important to

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[2] Formaldehyde emissions are more directly related to trapped AFR rather than total AFR. However, because of differences in engine design, defining trapped AFR for individual engines is difficult. Total AFR is relatively easy to determine, but comparison of formaldehyde emissions from different engine models is difficult because of the variations in "scavenging ratio".

[3] See Section 5.5.1 of Shareef, et.al. in Footnote 1.

look at AFR, cylinder temperatures, and other engine operating data when comparing data for different engines.

4.2 GMWA Engines (Engines 1-4)

The test data for Engines 1-4 are summarized in Table 4-1 and include:

- Full-load operation of all four engines, and
- Reduced load operation of Engine 3.

All of the full-load tests were conducted at between 97 and 101% of rated load. The reduced load test was conducted at 89% of rated torque. Formaldehyde concentrations during each of the 20-minute sampling runs are relatively consistent, with the variation of individual runs relative to the mean of <1.5 ppm.

Formaldehyde emissions during full-load operation ranged from 0.019 to 0.027 lb/MMBtu and averaged 0.023 lb/MMBtu. Formaldehyde emissions from Engine 3 at 89% of rated torque were 0.032 lb/MMBtu, which was ~50% higher than for Engine 3 at full load.

For comparative purposes, the formaldehyde emission factor in Section 3.2 of EPA AP-42 (July 2000) for 2-stroke engines is 0.0552 lb/MMBtu. The supporting documentation for AP-42 lists 42 tests. These tests include a variety of engine manufacturers and designs. Reported emission rates from individual tests range from 0.0055 to 0.16 lb/MMBtu. One of the listed sources is a GMWA-8 engine. FTIR (Fourier Infrared Spectroscopy) was used for formaldehyde sampling and analysis during this test, but detailed engine operating data are not provided. This engine was tested at 98% and 83% of rated torque while running at rated speed. The formaldehyde emission factors from these two tests were 0.027 and 0.029 lb/MMBtu, which is generally consistent with the Kenova measurements.

4.3 KVG Engines (Engines (5-8)

The test data for Engines 5-8 are summarized in Table 4-2 and include:

- Full-load operation of all four engines at rich-burn operating conditions (exhaust O_2 levels of 0.1 – 0.3% and CO concentrations of >3000 ppmvd),
- Reduced torque testing of Engines 7,
- Reduced torque and speed testing of Engine 7, and
- Full-load operation of Engine 7 after to adjusting the engine to achieve slight lean operating conditions (exhaust O_2 of 0.6% and CO of <200 ppmvd).

The full-load tests of Engines 4, 6, and 8 were conducted at between 96 and 100% of rated torque. Due to pipeline operating conditions, the maximum sustainable load during rich-burn testing of Engine 5 was 89% of rated torque. The reduced load test of Engine 5 was conducted at 40% of rated torque. During the low speed test of Engine 5, engine rpm was reduced to 260 compared to the rated rpm of 330. The lean-burn test of Engine 5 was conducted at 94% of rated torque and rated rpm. Exhaust temperatures were between 1142 and 1244 °F during all of the tests conducted at full speed, but decreased to 998 °F during the low speed test of Engine 7. Formaldehyde concentrations during each of the 20-minute sampling runs are relatively

Table 4-1. Kenova Station GMWA Engine Test Data Summary

Station Name:	Columbia Gas - Kenova				
Engine Manufacturer:	Cooper-Bessemer				
Engine ID:	GMWA-8				
Rated Horsepower:	2,000				
Rated Speed:	250				
Engine No.	**1**	**2**	**4**	**3**	**3**
Test Condition	Rated	Rated	Rated	Rated	Low Torque
Date	03/23/05	03/23/05	03/23/05	03/23/05	03/23/05
Test Start Time	9:56	12:04	14:12	16:00	17:56
Ambient Conditions					
Barometric Press ("Hg)	29.4	29.4	29.3	29.4	29.4
Ambient Temp. (F)	49	55	55	54	52
Relative Humidity (%)	88	86	80	94	82
Abs. Humidity (lb/klb dry air)	6.5	7.9	7.4	8.4	6.8
Operating Condition					
Brake horsepower (BHP)	1,945	1,969	1,994	1,998	1,790
Engine Speed (rpm)	251	251	248	248	251
Torque (%)	97.0%	98.1%	100.4%	100.5%	89.2%
Air Manifold Press ("Hg)	4.7	4.6	5.2	4.3	4.5
Air Manifold Temp (F)	89	94	94	93	90
Exhaust Manifold Temp (F)	614	578	565	596	568
Timing (deg btdc)	7.5	7.5	7.5	7.5	7.5
Fuel Flow (scfm)	248.5	241.9	246.6	250.5	234.2
Suction Pressure (psig)	97	98	80	100	101
Discharge Pressure (psig)	333	337	340	344	342
Load Step	1	1	1	1	3
Heat Input (MMBtu/hr) [a]	16.73	16.29	16.60	16.87	15.77
Heat Rate (Btu/BHP-hr) [b]	7,782	7,486	7,534	7,640	7,970
NG LHV (Btu/scf)	1,015	1,015	1,015	1,015	1,015
NG HHV (Btu/scf)	1,122	1,122	1,122	1,122	1,122
AFI	62.7	63.7	62.9	60.5	65.9
Exhaust Gas Conditions					
Moisture (%V)	6.3	6.4	6.9	6.7	5.9
O_2 (%V)	15.2	15.4	14.8	15.1	15.7
CO_2 (%V)	3.1	2.9	3.4	3.2	2.9
CO (ppmvd)	65.5	48.9	53.0	49.4	61.4
HCHO (ppmvd)	11.0	7.5	10.3	9.1	11.7
Exhaust Gas Flow					
Vol. Flow (dscfm) – Method 19	8,874	9,018	8,190	8,808	9,198
Fo	1.831	1.862	1.807	1.808	1.815
Exhaust Emissions					
HCHO (ppmvd @ 15% O_2)	11.3	8.1	9.9	9.2	13.3
HCHO (lb/hr)	0.45	0.32	0.40	0.37	0.50
HCHO (g/BHP-hr)	0.106	0.073	0.090	0.085	0.128
HCHO (lb/MMBtu)	0.027	0.019	0.024	0.022	0.032

[a] Based on HHV

[b] Based on LHV

Table 4-2. Kenova Station KVG Engine Test Data Summary

Station Name:	Columbia Gas - Kenova						
Engine Manufacturer:	Ingersoll-Rand						
Engine ID:	410 KVG						
Rated Horsepower:	1,100						
Rated Speed:	330						
Engine No.	5	6	7	7	7	7	8
Test Condition	Rated	Rated	Rated	Low Torque	Low Torque & RPM	Lean AFR	Rated
Date	03/23/05	03/24/05	03/24/05	03/24/05	03/24/05	03/24/05	03/24/05
Test Start Time	21:00	11:45	15:15	16:45	18:05	20:00	21:50
Ambient Conditions							
Barometric Press ("Hg)	29.5	29.8	29.8	29.8	29.8	29.8	29.8
Ambient Temp. (F)	44	39	40	40	40	40	40
Relative Humidity (%)	86	76	77	77	77	77	79
Abs. Humidity (lb/klb dry air)	5.2	3.7	3.9	4.0	3.9	3.9	4.1
Operating Conditions							
Brake horsepower (BHP)	1,099	1,066	974	436	326	1,039	1,053
Engine Speed (rpm)	328	331	328	329	260	330	330
Torque (%)	100.4%	96.7%	89.1%	39.8%	37.7%	94.4%	95.9%
Air Manifold Press ("Hg)	-7.1	-6.0	-10.3	-16.6	-17.3	-5.1	-9.0
Air Manifold Temp (F)	60.4	58.3	60.9	64.2	65.6	60.0	61
Exhaust Manifold Temp (F)	1244	1181	1209	1142	998	1233	1212
Timing (deg btdc)	15.0	15.0	15.0	15.0	15.0	15.0	15
Fuel Flow (scfm)	149.0	166.3	153.3	100.5	81.8	157.2	133
Suction Pressure (psig)	324	322	320	322	324	322	324
Discharge Pressure (psig)	579	803	545	558	569	596	607
Load Step	8	0	0	7	7	0	0
Heat Input (MMBtu/hr) [a]	10.09	11.27	10.39	6.81	5.54	10.64	8.99
Heat Rate (Btu/BHP-hr) [b]	8,310	9,562	9,647	14,117	15,379	9,275	7,720
NG LHV (Btu/scf)	1,021.7	1,021.7	1,021.7	1,021.7	1,021.7	1,021.7	1,021.7
NG HHV (Btu/scf)	1,128.8	1,128.8	1,128.8	1,128.8	1,128.8	1,128.8	1,128.8
AFI	94.4	89.8	79.0	81.5	74.6	97.9	97.6
Exhaust Gas Conditions							
Moisture (%V)	17.7	17.3	17.5	17.5	17.5	17.1	17.4
O_2 (%V)	0.1	0.3	0.1	0.1	0.1	0.6	0.3
CO_2 (%V)	11.9	11.8	11.0	10.6	10.2	11.8	11.8
CO (ppmvd)	3722	3362	>5000	>5000	>5000	152	3505
HCHO (ppmvd)	6.9	10.4	5.0	5.0	5.8	10.0	8.3
Exhaust Gas Flow							
Vol. Flow (dscfm) – Method 19	1,472	1,658	1,515	992	808	1,592	1,321
Fo	1.709	1.712	1.828	1.893	1.968	1.712	1.707
Exhaust Emissions							
HCHO (ppmvd @ 15% O_2)	2.0	3.0	1.4	1.4	1.6	2.9	2.4
HCHO (lb/hr)	0.047	0.081	0.035	0.023	0.022	0.074	0.051
HCHO (g/BHP-hr)	0.020	0.034	0.016	0.024	0.030	0.033	0.022
HCHO (lb/MMBtu)	0.0047	0.0071	0.0034	0.0034	0.0039	0.0070	0.0057

[a] Based on HHV

[b] Based on LHV

consistent, with the variation of individual runs relative to the mean of <1.0 ppmvd, except for the lean-burn test of Engine 7 during which the maximum variation was 2.2 ppmvd.

Formaldehyde emissions during full-load rich-burn operation ranged from 0.0034 to 0.0071 lb/MMBtu and averaged 0.0052 lb/MMBtu. Emission rates from Engine 7 at low torque and full speed were 0.0034 lb/MMBtu, which is the same emission rate as during the full-load test of Engine 7. Formaldehyde emissions during testing at reduced torque and reduced speed were 0.0039 lb/MMBtu, which is slightly higher but similar to the other rich-burn Engine 7 tests. Formaldehyde emissions during lean-burn testing of Engine 7 were 0.0070 lb/MMBtu, which is roughly double the emission rate at rich-burn conditions.

The formaldehyde emission factor in Section 3.2 of EPA AP-42 (July 2000) for 4-stroke, rich-burn engines is 0.0205 lb/MMBtu. The supporting documentation for AP-42 lists 18 tests and includes a variety of engine manufacturers and models. AP-42 classified these engines as rich-burn based on their design, and not on actual operating conditions at the time of the testing. Of the 18 tests in the data set, 14 of the tests were conducted while the engines were actually operating at lean-burn conditions based on >2.0% O_2 in the exhaust. Of the four remaining tests, two reported exhaust O_2 levels of 0.3% and formaldehyde emissions were 0.0047 and 0.0050 lb/MMBtu, which is similar to the emission rates measured for the Kenova engines. The other two tests reported exhaust O_2 of 0.4% and formaldehyde emissions of 0.015 and 0.016 lb/MMBtu; however, these two data points were taken from the GRI "Air Toxics" report[4] and are for a high-speed (1,000 rpm) engine, which provides less residence time for formaldehyde destruction and thus higher emissions compared to the slower speed (330 rpm) KVG engines at Kenova.

[4] Shareef, G.S., et. al. as cited in Footnote 1.

ATTACHMENT D

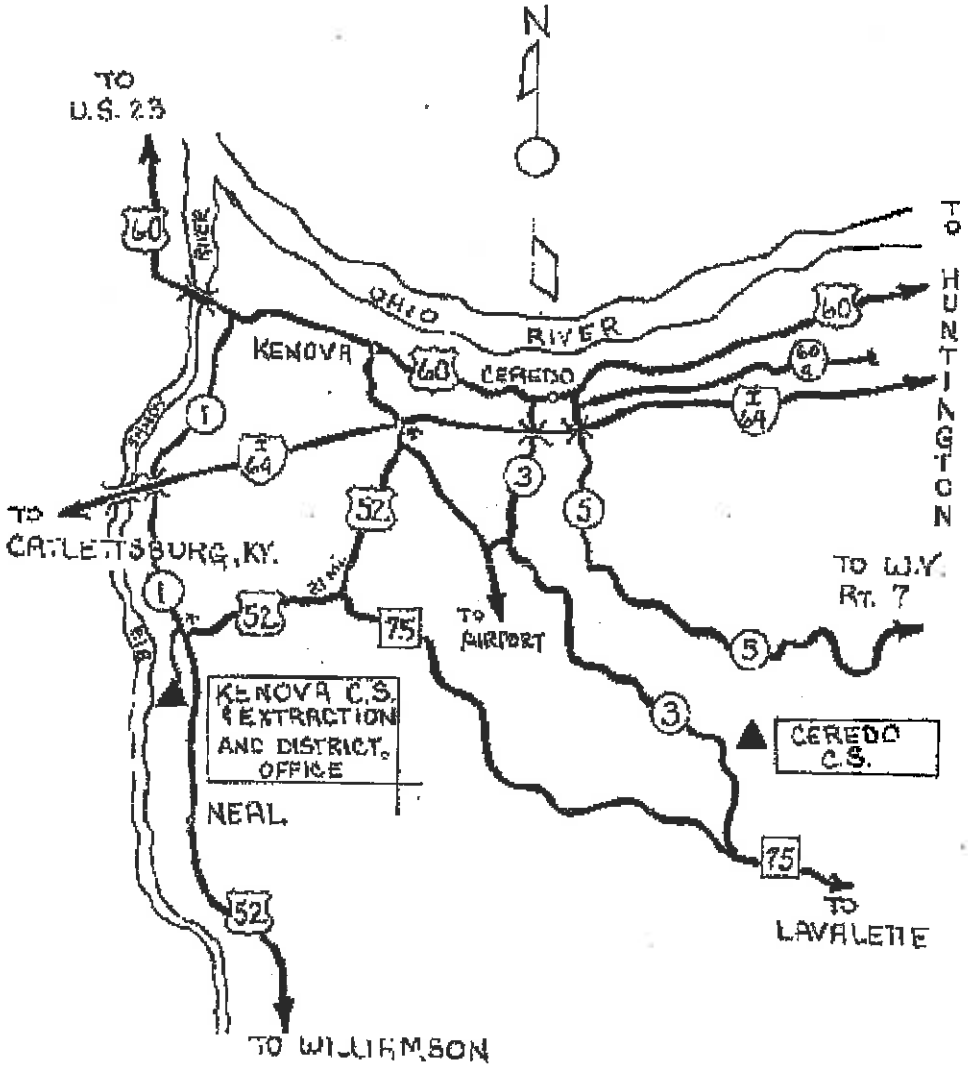
MAP(S)

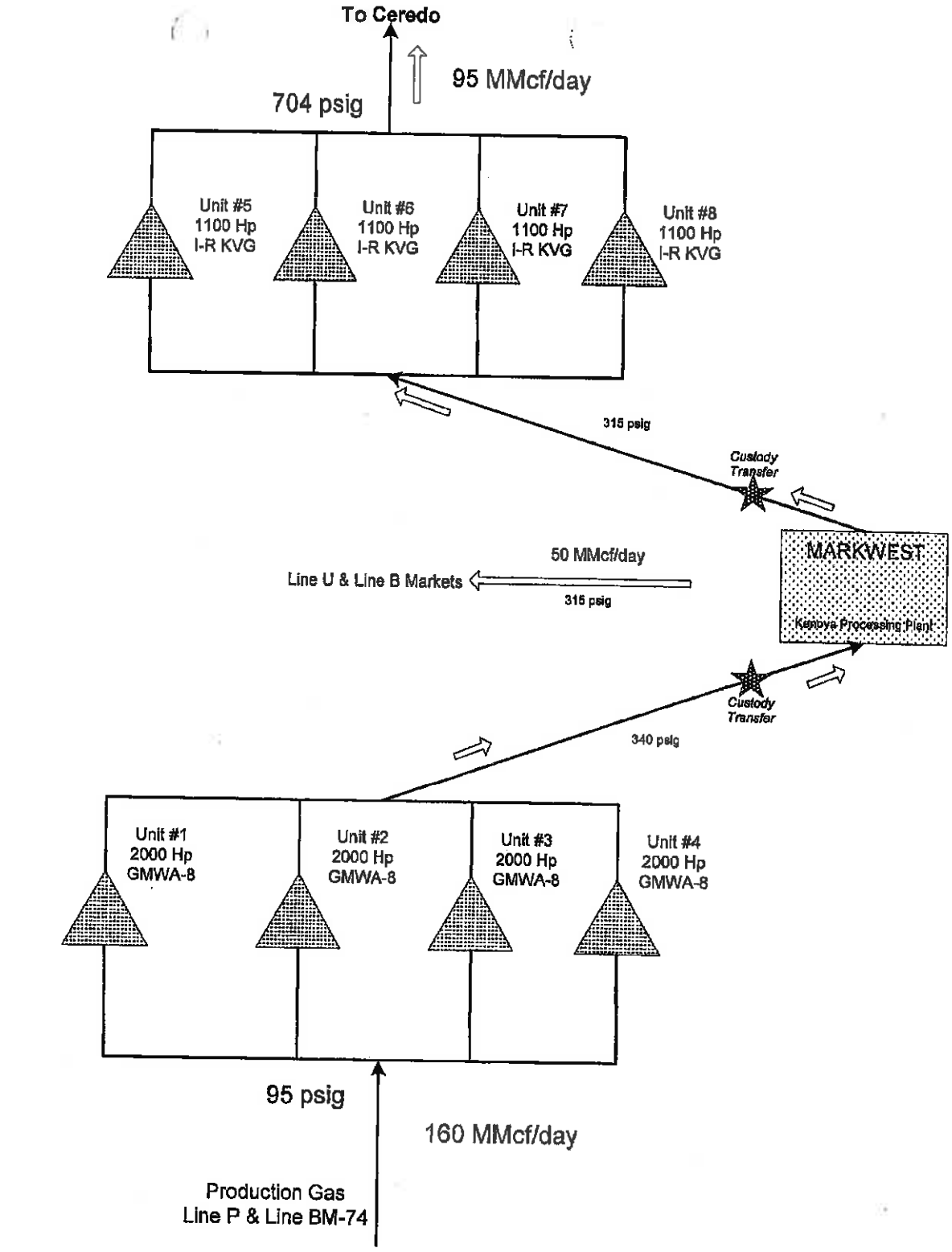
PLOT PLAN(S)

PROCESS FLOW DIAGRAM

Kenova Compressor Station - Located in Ceredo District, Wayne County, West Virginia, approximately 2 miles south on US Route 52, from the intersection of Route 52 and I-64.

Phone: (304) 453-7400 Compressor Station



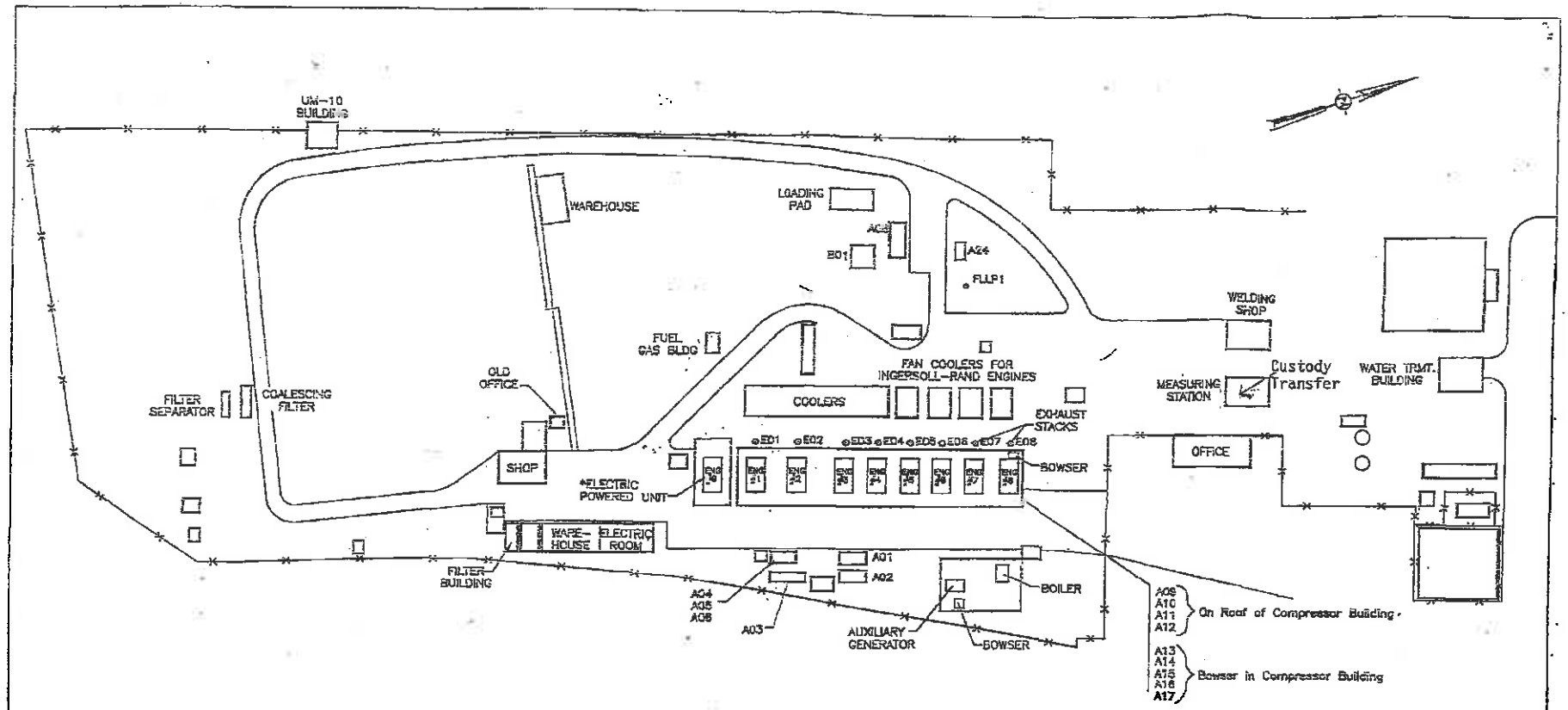


COLUMBIA GAS TRANSMISSION CORPORATION

Kenova Compressor Station

Facility ID# 03-54-099-00014

Compressor Unit

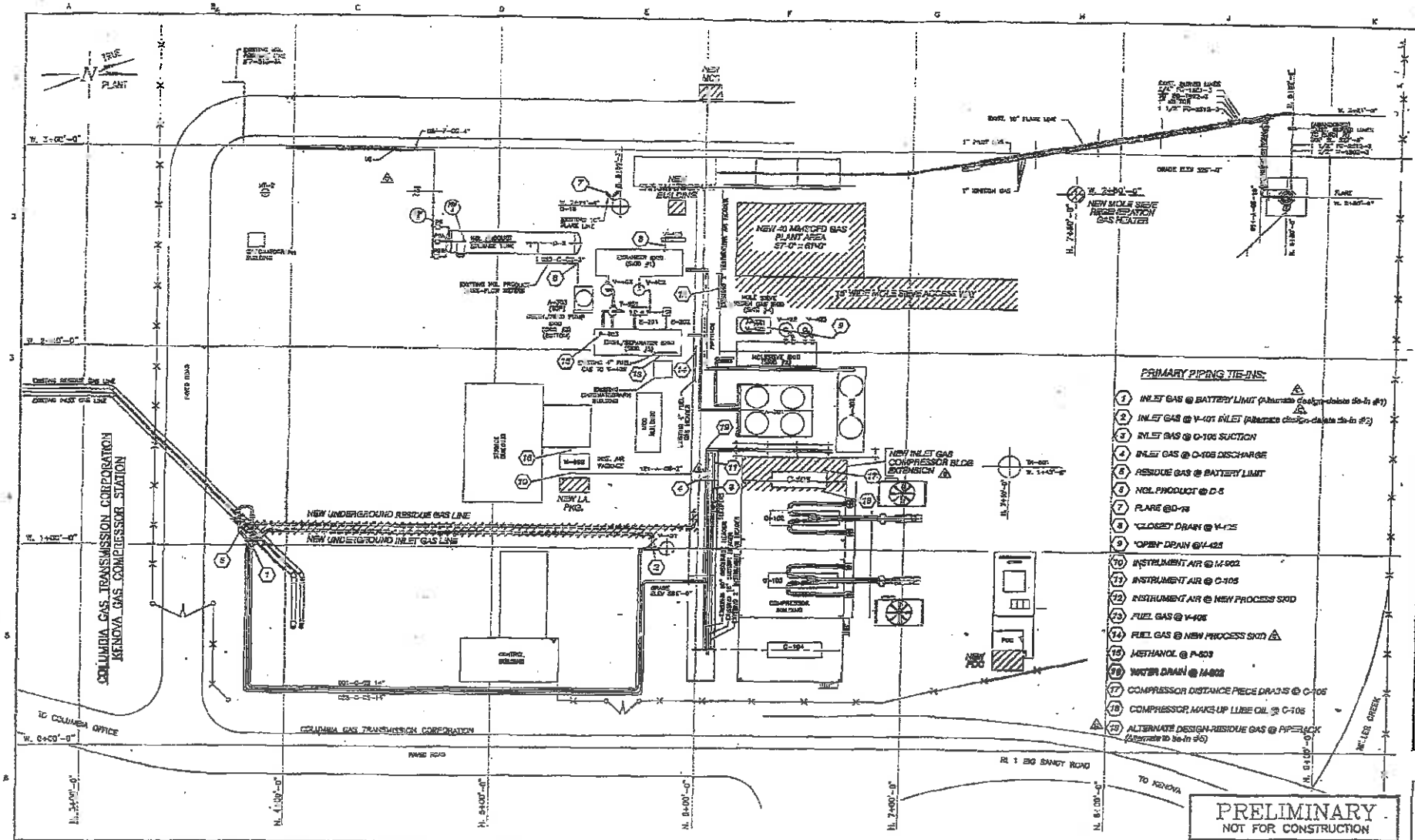


SIGNIFICANT EMISSION UNITS	
Emission Point ID Number	Equipment Category
E01	Recip Engine/Integral Compressor No. 02001
E02	Recip Engine/Integral Compressor No. 02002
E03	Recip Engine/Integral Compressor No. 02003
E04	Recip Engine/Integral Compressor No. 02004
E05	Recip Engine/Integral Compressor No. 02005
E06	Recip Engine/Integral Compressor No. 02006
E07	Recip Engine/Integral Compressor No. 02007
E08	Recip Engine/Integral Compressor No. 02008
G1	Recip Engine/Generator No. 02061

70 0 70

SCALE IN FEET

STATUS: NONE		Site Plan Columbia Gas Transmission Corp. Kenova Station	
CONFIDENTIAL-ALL RIGHTS RESERVED-PROPERTY OF URS	DRAWN BY: TSH	DATE: 28SEP01	
	CHECKED BY:	DATE:	
	APPROVED BY:	DATE:	
	CONTRACT NO.: 80141405.80	DRAWING NO.: KEN-BM3	REV: 1



REFERENCE DRAWINGS	NO	REVISIONS	DATE	BY	CHKD	APPVD
		ISSUED FOR AIR QUALITY PERMIT APPLICATION	3/6/98	DJ	DAH	
		ISSUED FOR BID — REVISED	2/11/98	DJ	DAH	
		ISSUED FOR BID	2/4/98	GRD	DAH	
		ISSUED FOR REVIEW	1/29/98	DRC	DAH	

PRINT ISSUE RECORD

	DATE	BY
DATE		
FOR		
REVISED		
CLIENT		
FIELD		
MARATHON		

DRAWING STATUS

	DATE
ISSUED	
PRELIMINARY	
FOR COMMENTS AND/OR APPROVAL	
APPROVED FOR CONSTRUCTION	
ISSUED AND/OR APPROVED FOR CONSTRUCTION	

	BY	DATE
DRAWN		
CHECKED		

MARKWEST Hydrocarbon Inc.
155 Inverness Drive West, Suite 300
Englewood, CO 80112-5004

KENOVA GAS PROCESSING PLANT
NEW 40 MMSCFD PLANT LAYOUT AREA

CLIENT DRAWING NO.

PROJECT NUMBER 2-287-98

SCALE

SHEET 1 OF 1

DRAWING NUMBER 47-98-D01

REVISION D

ATTACHMENT E

EMISSION FACTOR DOCUMENTATION

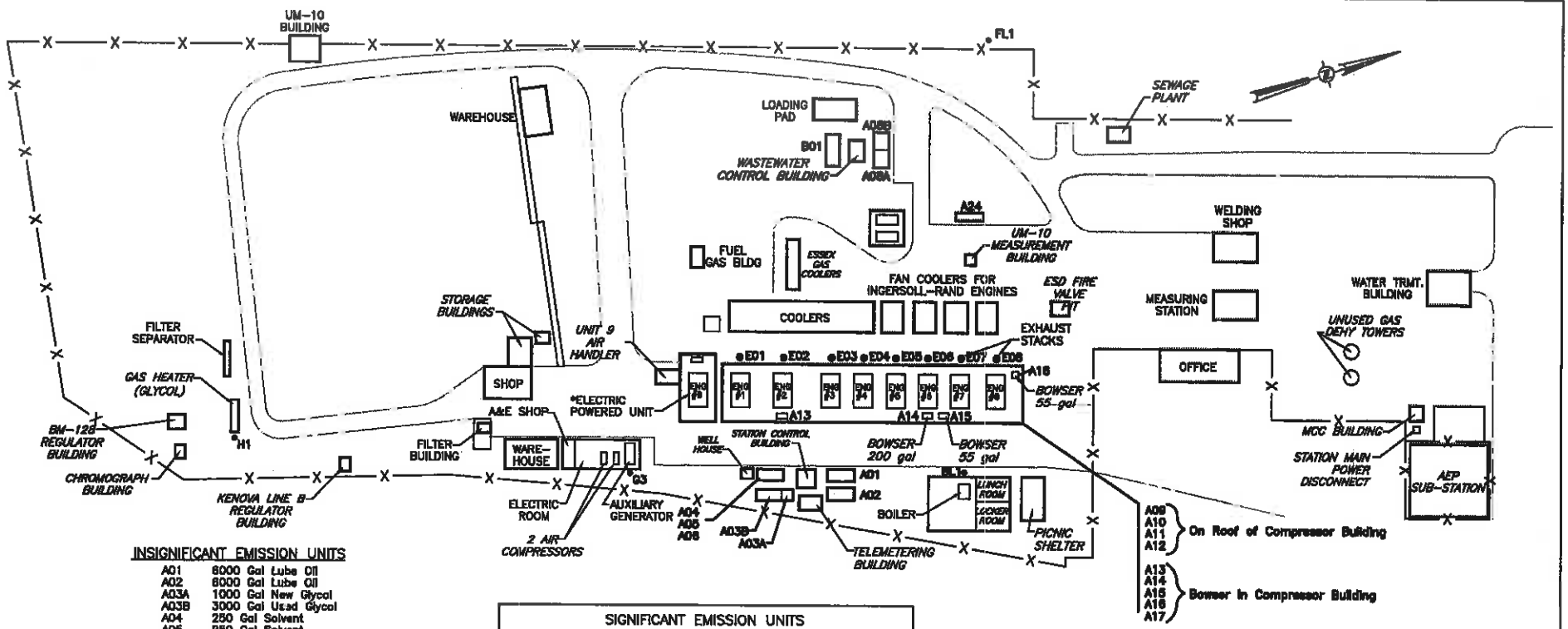
FORMALDEHYDE EMISSION LEVELS

The following table provides formaldehyde (CH_2O) levels that are valid for new engines for the duration of the standard warranty period and are attainable by an engine in good operating condition running on commercial quality natural gas of 900 BTU/ft^3 (35.38 MJ/m^3 [25, V(0; 101.325)]) SLHV, Waukesha Knock Index™ of 91 or higher, 93% methane content by volume, and at ISO standard conditions. Values are based on standard engine timing at 91 WKI™ with an absolute humidity of 42 grains/lb. Refer to engine specific WKI™ Power & Timing curves for standard timing. Unless otherwise noted, these emission levels can be achieved across the continuous duty speed range at the load levels tabulated. ***Contact your local Waukesha representative or Waukesha's Sales Engineering Department for emission values which can be obtained on a case-by-case basis for specific ratings, fuels, and site conditions.***

MODEL	CARB. SETTING	CH_2O GRAMS/ BHP-HR		% OBSERVED DRY		MASS AFR[2]	VOLUME AFR[2]	EXCESS AIR RATIO
		PERCENT LOAD		CO	O_2			
		100%	75%					
AT25GL	Lean Burn	0.18	0.20	0.06	9.8	28.0:1	16.8:1	1.74
AT27GL	Lean Burn	0.18	0.20	0.06	9.8	28.0:1	16.8:1	1.74
	Ultra Lean	0.18	0.20	0.05	11.2	32.0:1	19.2:1	2.00
VHP G, GSI	Rich Burn	0.05	0.05	0.02 – 1.15	0.30 – 1.35	15.5:1 – 17.0:1	9.3:1 – 10.2:1	0.97 – 1.06
VHP Series 4 GSI	Rich Burn	0.05	0.05	0.02 – 0.45	0.30 – 1.35	15.85:1 – 17.0:1	9.5:1 – 10.2:1	0.99 – 1.06
L5774LT L5794LT	Lean Burn	0.22	0.25	0.04	7.8 – 8.0	24.5:1 – 24.7:1	14.7:1 – 14.8:1	1.52 – 1.54
VHP GL	Lean Burn	0.29	0.34	0.06	9.8	28.0:1	16.8:1	1.74
VGF G, GSID	Rich Burn	0.05	0.05	0.20 – 1.1	0.18 – 2.4	15.5:1 – 18.0:1	9.3:1 – 10.8:1	0.97 – 1.12
VGF GL, GLD, GLD/2	Lean Burn	0.19	0.22	0.03 – 0.04	7.8 – 9.0	21.5:1 – 25.4:1	13.9:1 – 15.2:1	1.53 – 1.65
VSG G, GSI, GSID	Rich Burn	0.05	0.05	0.02 – 1.15	0.29 – 2.10	15.5:1 – 17.7:1	9.3:1 – 10.6:1	0.97 – 1.10
F1197G	Rich Burn	0.05	0.05	0.04 – 1.35	0.30 – 1.35	15.5:1 – 17.0:1	9.3:1 – 10.2:1	0.97 – 1.06
F817G	Rich Burn	0.05	0.05	0.04 – 1.30	0.30 – 1.35	15.5 :1 – 17.0:1	9.3:1 – 10.2:1	0.97 – 1.08

Attachment E

Plot Plan



INSIGNIFICANT EMISSION UNITS

A01	6000 Gal Lube Oil
A02	6000 Gal Lube Oil
A03A	1000 Gal New Glycol
A03B	3000 Gal Used Glycol
A04	250 Gal Solvent
A05	250 Gal Solvent
A06	250 Gal Gasoline
A08A	4000 Gal Pipeline Liquids
A08B	4000 Gal Used Oil
A09	1150 Gal Glycol Surge
A10	1150 Gal Glycol Surge
A11	1150 Gal Glycol Surge
A12	1150 Gal Glycol Surge
A13	200 Gal Lube Oil Bowser
A14	200 Gal Lube Oil Bowser
A15	55 Gal R & O 32 Oil
A16	55 Gal Mobil DTE Oil
A17	Lube Oil Tank
A24	1000 Gal Mercaptan Tank
B01	8000 Gal Wastewater (Below ground)

SIGNIFICANT EMISSION UNITS

Emission Point ID Number	Equipment Category
BL1	Boiler BLR1 - Replaced by Boiler BLR2
E01	Recip Engine/Integral Compressor No. 02001
E02	Recip Engine/Integral Compressor No. 02002
E03	Recip Engine/Integral Compressor No. 02003
E04	Recip Engine/Integral Compressor No. 02004
E05	Recip Engine/Integral Compressor No. 02005
E06	Recip Engine/Integral Compressor No. 02006
E07	Recip Engine/Integral Compressor No. 02007
E08	Recip Engine/Integral Compressor No. 02008
FL1	Mercaptan Flare- Replaced by Vapor Recovery
G3	Recip Engine/Generator No. 02003
H1	Line Heater HTR1

MAPPING REFERENCE:
DRAWING TITLED "KEN-BM3" rev. 2 PROVIDED TO POTESTA & ASSOCIATES, INC. BY NISOURCE.

PROJECT #: 10-0412-015 FILENAME: B10-0412-01

POTESTA & ASSOCIATES, INC.
ENGINEERS AND ENVIRONMENTAL CONSULTANTS
7012 MacCorkle Ave. SE, Charleston, WV 25304
TEL: (304) 342-1400 FAX: (304) 343-9031
E-Mail Address: potesta@potesta.com

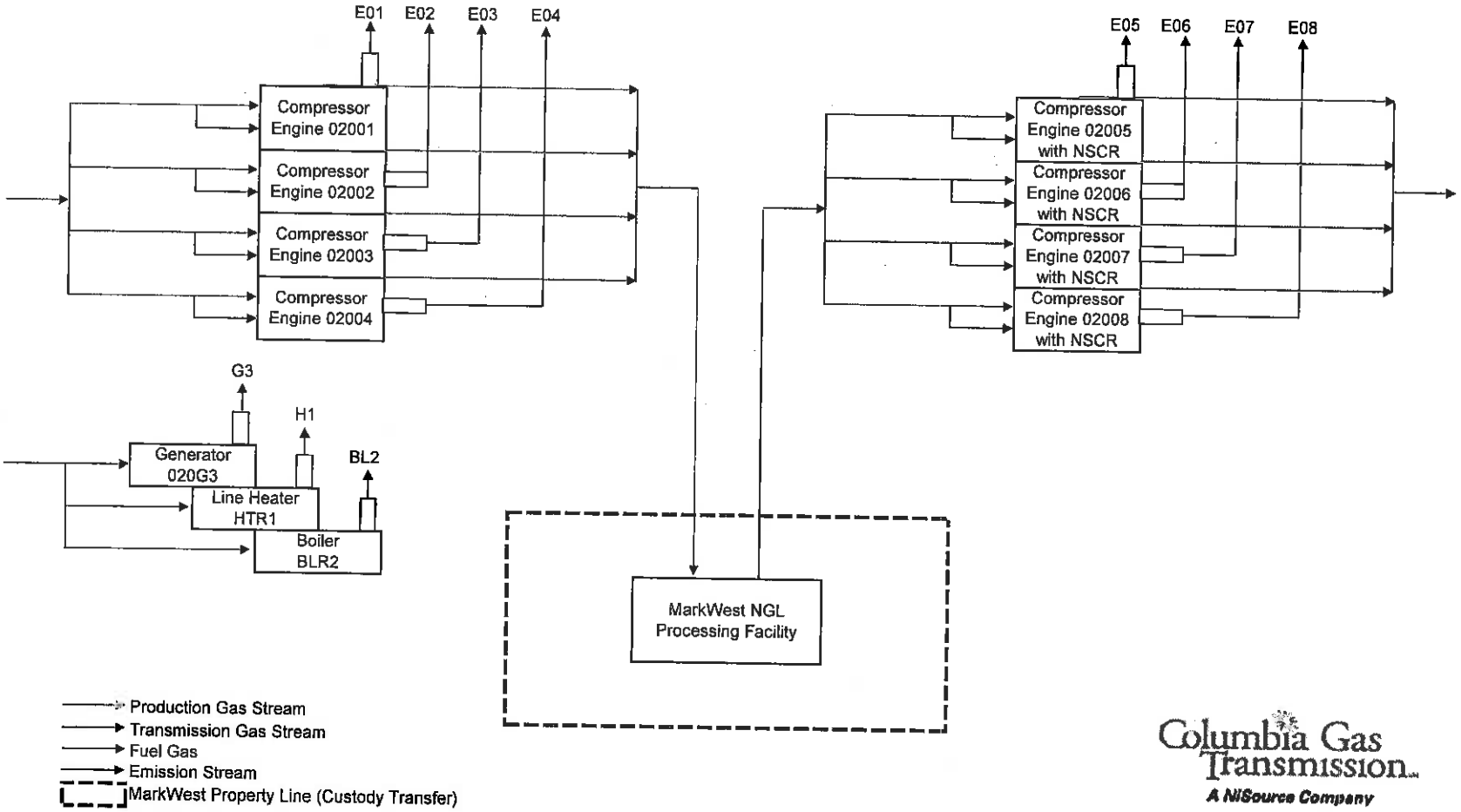
Project
SITE PLAN
COLUMBIA GAS TRANSMISSION CORP.
KENOVA STATION

Scale NOT TO SCALE | Dwg. No. 1
Date OCT. 2011

Attachment F

Detailed Process Flow Diagram

ATTACHMENT F
KENOVA COMPRESSOR STATION PROCESS FLOW DIAGRAM



Columbia Gas Transmission
A NiSource Company

Attachment G

Process Description

Process Description

Pipeline transmission of natural gas requires that the gas be compressed. At the Kenova Compressor Station, eight (8) reciprocating internal combustion engines (RICE) are used to compress natural gas. Natural gas is received on the suction side of engines E01 through E04. The engines compress the gas prior to delivery to the adjacent MarkWest Natural Gas Liquids (NGL) facility. At this point, a transfer of custody takes place as the gas enters a processing plant.

The MarkWest facility extracts propane and heavy hydrocarbons from the incoming natural gas. When MarkWest has finished the NGL extraction process, the custody of natural gas is then transferred back to the Kenova Compressor Station for additional compression using engines E05 through E08 for gas transmission.

As discussed further in Attachment D-1, engines E01 through E04, the MarkWest facility, and engines E05 through E08 are considered separate facilities when determining major source status for the applicability of 40 CFR 63. For each Kenova Compressor Station facility, total HAP emissions are below the 25-tpy major source threshold. Additionally, formaldehyde emissions from the aggregate of engines E01 through E04 and the aggregate of engines E05 through E08 are each less than the 10 tpy major source threshold. Therefore, the Station is considered a minor source of HAPs based on the definitions in 40 CFR 63 Subpart ZZZZ.

Attachment H

MSDSs

No new processes or chemicals will be added to the compressor station as a result of this modification. Therefore, the Department can continue to rely on the MSDS package submitted with the prior application.

Attachment I

Emission Units Table

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
02001	E01	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWA-8; 2-cycle, lean burn	1959	2,000 HP	Existing	-
02002	E02	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWA-8; 2-cycle, lean burn	1959	2,000 HP	Existing	-
02003	E03	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWA-8; 2-cycle, lean burn	1959	2,000 HP	Existing	-
02004	E04	Reciprocating Engine/Integral Compressor; Cooper-Bessemer GMWA-8; 2-cycle, lean burn	1959	2,000 HP	Existing	-
02005	E05	Reciprocating Engine/Integral Compressor; Ingersoll-Rand 410 KVG-1; 4-cycle, rich burn	1959	1,100 HP	Existing	NSCR-E05
02006	E06	Reciprocating Engine/Integral Compressor; Ingersoll-Rand 410 KVG-1; 4-cycle, rich burn	1959	1,100 HP	Existing	NSCR-E06
02007	E07	Reciprocating Engine/Integral Compressor; Ingersoll-Rand 410 KVG-1; 4-cycle, rich burn	1959	1,100 HP	Existing	NSCR-E07
02008	E08	Reciprocating Engine/Integral Compressor; Ingersoll-Rand 410 KVG-1; 4-cycle, rich burn	1959	1,100 HP	Existing	NSCR-E08
HTR1	H1	Line Heater; BS&B	1963	1.5 MMBtu/hr	Existing	-
BLR2	BL2	Boiler, Natural Gas-fired; Hurst S-4-G-150-15	2013	6.3 MMBtu/hr	Existing	-
020G3	G3	Reciprocating Engine/Generator; Waukesha VGF-H24GL; 4-cycle, lean burn; emergency	2003	500 HP	Existing	-
A24	FL1	Mercaptan Tank	1999	1,000 gallon	Existing	Vapor Recovery

[1] For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
[2] For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

Attachment J

Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
E01		02001		-		-	-	NO_x	122.10	221.63			Gas	EE	
								CO	4.11	9.81			Gas	EE	
								VOC	2.22	8.83			Gas	EE	
								SO_2	1.06	0.05			Gas	EE	
								PM	0.89	3.55			Solid	EE	
								CH_2O	0.50	1.99			Gas	EE	
E02		02002		-		-	-	NO_x	122.10	221.63			Gas	EE	
								CO	4.11	9.81			Gas	EE	
								VOC	2.22	8.83			Gas	EE	
								SO_2	1.06	0.05			Gas	EE	
								PM	0.89	3.55			Solid	EE	
								CH_2O	0.50	1.99			Gas	EE	
E03		02003		-		-	-	NO_x	122.10	221.63			Gas	EE	
								CO	4.11	9.81			Gas	EE	
								VOC	2.22	8.83			Gas	EE	
								SO_2	1.06	0.05			Gas	EE	
								PM	0.89	3.55			Solid	EE	
								CH_2O	0.50	1.99			Gas	EE	
E04		02004		-		-	-	NO_x	122.10	221.63			Gas	EE	
								CO	4.11	9.81			Gas	EE	
								VOC	2.22	8.83			Gas	EE	
								SO_2	1.06	0.05			Gas	EE	
								PM	0.89	3.55			Solid	EE	
								CH_2O	0.50	1.99			Gas	EE	
E05		02005		NSCR -E05	NSCR	-	-	NO_x	28.35	112.87	28.35	112.87	Gas	EE	
								CO	47.71	189.98	11.93	47.50	Gas	EE	
								VOC	0.38	1.51	0.27	1.06	Gas	EE	
								SO_2	0.73	0.04	0.73	0.04	Gas	EE	
								PM	0.25	0.99	0.25	0.99	Solid	EE	
								CH_2O	0.09	0.36	0.09	0.36	Gas	EE	

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
E06		02006		NSCR -E06	NSCR	-	-	NO_x	28.35	112.87	28.35	112.87	Gas	EE	
								CO	47.71	189.98	11.93	47.50	Gas	EE	
								VOC	0.38	1.51	0.27	1.06	Gas	EE	
								SO_2	0.73	0.04	0.73	0.04	Gas	EE	
								PM	0.25	0.99	0.25	0.99	Solid	EE	
								CH_2O	0.09	0.36	0.09	0.36	Gas	EE	
E07		02007		NSCR -E07	NSCR	-	-	NO_x	28.35	112.87	28.35	112.87	Gas	EE	
								CO	47.71	189.98	11.93	47.50	Gas	EE	
								VOC	0.38	1.51	0.27	1.06	Gas	EE	
								SO_2	0.73	0.04	0.73	0.04	Gas	EE	
								PM	0.25	0.99	0.25	0.99	Solid	EE	
								CH_2O	0.09	0.36	0.09	0.36	Gas	EE	
E08		02008		NSCR -E08	NSCR	-	-	NO_x	28.35	112.87	28.35	112.87	Gas	EE	
								CO	47.71	189.98	11.93	47.50	Gas	EE	
								VOC	0.38	1.51	0.27	1.06	Gas	EE	
								SO_2	0.73	0.04	0.73	0.04	Gas	EE	
								PM	0.25	0.99	0.25	0.99	Solid	EE	
								CH_2O	0.09	0.36	0.09	0.36	Gas	EE	
H1		HTR1		-		-	-	NO_x	0.15	0.64			Gas	EE	
								CO	0.12	0.54			Gas	EE	
								VOC	0.01	0.04			Gas	EE	
								SO_2	0.09	0.005			Gas	EE	
								PM	0.01	0.05			Solid	EE	
								CH_2O	0.0001	0.0005			Gas	EE	
BL2		BLR2		-		-	-	NO_x	0.62	2.71			Gas	EE	
								CO	0.52	2.27			Gas	EE	
								VOC	0.03	0.15			Gas	EE	
								SO_2	0.36	0.02			Gas	EE	
								PM	0.05	0.21			Solid	EE	
								CH_2O	0.0005	0.002			Gas	EE	

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^3)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
G3		020G3		-		-	-	NO_x	1.27	0.29			Gas	EE	
								CO	1.57	0.36			Gas	EE	
								VOC	0.90	0.21			Gas	EE	
								SO_2	0.30	0.0008			Gas	EE	
								PM	0.05	0.01			Solid	EE	
								CH_2O	0.28	0.06			Gas	EE	
FL1		A24		-		-	-	NO_x	-	-			Gas	EE	
								CO	-	-			Gas	EE	
								VOC	-	-			Gas	EE	
								SO_2	-	-			Gas	EE	
								PM	-	-			Solid	EE	
								CH_2O	-	-			Gas	EE	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
E01	1.7	600	15,743	115.7	556	41.0	4,248.2	360.9
E02	1.7	600	15,743	115.7	556	42.4	4,248.2	360.9
E03	1.7	600	15,743	115.7	556	42.4	4,248.2	360.9
E04	1.7	600	15,743	115.7	556	41.0	4,248.2	360.9
E05	1.0	1150	7,530	159.8	556	42.7	4,248.2	360.9
E06	1.0	1150	7,530	159.8	556	42.7	4,248.2	360.9
E07	1.0	1150	7,530	159.8	556	42.7	4,248.2	360.9
E08	1.0	1150	7,530	159.8	556	42.7	4,248.2	360.9
H1	1.06	350	1,244	23.5	556	24	4,248.2	360.9
BL2	1.33				556	20	4,248.2	360.9
G3	0.73	1000	2,404	96.0	556	2	4,248.2	360.9
FL1					556		4,248.2	360.9

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

Attachment K

Fugitive Emissions Data Summary Sheet

There will be no changes in fugitive emissions.

Attachment L

Emissions Unit Data Sheets

There will be no changes in emission units.

Attachment M

Air Pollution Control Device Sheet

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): NSCR-E05 through NSCR-E08

Equipment Information

1. Manufacturer: DCL Model No. DC76-16 CC	2. Control Device Name: Type: Non-selective catalytic reduction (NSCR)
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: 90% formaldehyde reduction	
8. Attached efficiency curve and/or other efficiency information.	
9. Design inlet volume: SCFM	10. Capacity:
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. N/A	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment.	
13. Description of method of handling the collected material(s) for reuse of disposal. N/A	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☒ No
Are particulates present?	☐ Yes	☒ No
Are metals present?	☐ Yes	☒ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):		
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☐ Particulate (type): ☐ SO_x	☐ Odor ☒ Other CO, VOC
17. Inlet gas velocity: 125.3 ft/sec	18. Pollutant specific gravity:
19. Gas flow into the collector: 5,901 ACF @ 1,000 °F and PSIA	20. Gas stream temperature: Inlet: 1000 °F Outlet: 1150 – 1200 °F
21. Gas flow rate: Design Maximum: 7,530 ACFM Average Expected: 7,530 ACFM	22. Particulate Grain Loading in grains/scf: N/A Inlet: Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant lb/hr	IN Pollutant grains/acf	Emission Capture Efficiency %	OUT Pollutant lb/hr	OUT Pollutant grains/acf	Control Efficiency %
A – CO	47.71		100%	11.93		75%
B – VOC	0.38		100%	0.27		30%
C						
D						
E						

24. Dimensions of stack: Height 42.7 ft. Diameter 1.0 ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table: N/A

Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector: Weight % for Size Range	Fraction Efficiency of Collector: Weight % for Size Range
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification): N/A

28. Describe the collection material disposal system: N/A

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet? Yes

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Columbia automatically shuts down the engine if the catalyst inlet temperature exceeds 1250 °F as specified in 40 CFR 63 Subpart ZZZZ.	RECORDKEEPING: Columbia maintains records as specified in 40 CFR 63.6655.
REPORTING: A compliance report is submitted semi-annually, outlining the results of the annual compliance demonstration as specified in 40 CFR 63 Subpart ZZZZ.	TESTING: Columbia conducts annual compliance demonstrations as specified in 40 CFR 63 Subpart ZZZZ.

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant. 75% CO; 30% VOC (as required per 40 CFR 63 Subpart ZZZZ)

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant. 75% CO; 30% VOC (as required per 40 CFR 63 Subpart ZZZZ)

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty. N/A

Attachment N

Supporting Emissions Calculations

Columbia Gas Transmission, LLC
Kenova Compressor Station

Facility Total PTE Prior to Installation of NSCR on Engines E05-E08

Source	Annual Emissions (tpy)							
	NO_x	CO	CO_2e	$PM_{10}/PM_{2.5}$	VOC	SO_2	CH_2O	Total HAP
Cooper-Bessemer Reciprocating Engines (E01-E04)	886.51	39.24	34,466	14.22	35.32	0.21	7.95	15.11
Ingersoll-Rand Reciprocating Engines (E05-E08)	451.47	759.93	23,921	3.97	6.05	0.15	1.45	3.89
Waukesha Emergency Generator (G3)	0.29	0.36	139	0.01	0.21	8.48E-04	0.06	0.09
Boiler (BL2)	2.71	2.27	3,231	0.21	0.15	0.02	2.03E-03	0.05
Line Heater (H1)	0.64	0.54	769	0.05	0.04	4.69E-03	4.83E-04	0.01
Facility PTE	1,341.62	802.35	62,527	18.45	41.76	0.38	9.46	19.14

Facility Total PTE After Installation of NSCR on Engines E05-E08

Source	Annual Emissions (tpy)							
	NO_x	CO	CO_2e	$PM_{10}/PM_{2.5}$	VOC	SO_2	CH_2O	Total HAP
Cooper-Bessemer Reciprocating Engines (E01-E04)	886.51	39.24	34,466	14.22	35.32	0.21	7.95	15.11
Ingersoll-Rand Reciprocating Engines (E05-E08)	451.47	189.98	23,921	3.97	4.23	0.15	1.45	3.89
Waukesha Emergency Generator (G3)	0.29	0.36	139	0.01	0.21	8.48E-04	0.06	0.09
Boiler (BL2)	2.71	2.27	3,231	0.21	0.15	0.02	2.03E-03	0.05
Line Heater (H1)	0.64	0.54	769	0.05	0.04	4.69E-03	4.83E-04	0.01
Facility PTE	1,341.62	232.40	62,527	18.45	39.94	0.38	9.46	19.14

Columbia Gas Transmission, LLC
Kenova Compressor Station

Cooper-Bessemer GMWA-8 2SLB Reciprocating Engines (E01 through E04)

Horsepower	2000 HP
Maximum Horsepower	2200 HP
Brake Specific Fuel Consumption	8400 Btu/Bhp-hr
Total Heat Input	16.80 MMBtu/hr
Maximum Heat Input	18.48 MMBtu/hr
Operating Hours	8760 hr/yr
Natural Gas Heat Content	1020 Btu/scf
Fuel Consumption	144.28 MMscf/yr
	18,118 scf/hr based on maximum heat input
Quantity	4

Pollutant	Emission Factor		Emission Rate			Emission Factor Reference
	lb/bhp-hr	lb/MMBtu	lb/hr[1]	ton/yr (1 engine)	ton/yr (4 engines)	
NO_x (Maximum Hourly)	5.55E-02		122.10			Stack Test-Based Emission Factor
NO_x (Average Annual)	2.53E-02			221.63	886.51	Stack Test-Based Emission Factor
CO (Maximum Hourly)	1.87E-03		4.11			Stack Test-Based Emission Factor
CO (Average Annual)	1.12E-03			9.81	39.24	Stack Test-Based Emission Factor
CO_2e		117.1	2,164	8,617	34,466	40 CFR 98 Subpart C
PM_{10}		0.048	0.89	3.55	14.22	AP-42 Table 3.2-1 (7/00) - 2SLB
$PM_{2.5}$		0.048	0.89	3.55	14.22	AP-42 Table 3.2-1 (7/00) - 2SLB
VOC		0.120	2.22	8.83	35.32	AP-42 Table 3.2-1 (7/00) - 2SLB
SO_2 (Maximum Hourly)		0.0571	1.06			20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		0.05	0.21	0.25 grains S / 100 scf
Formaldehyde		0.0270	0.50	1.99	7.95	Source Test Max -- March 2005
Total HAPs		0.05134	0.95	3.78	15.11	AP-42 Table 3.2-1 (7/00) - 2SLB

1. Maximum hourly emission rate based on maximum horsepower under optimum conditions (10% greater than site rating).

Columbia Gas Transmission, LLC
Kenova Compressor Station

Ingersoll-Rand 410 KVG-1 4SRB Reciprocating Compressor Engines (E05-E08) - Pre-Control

Horsepower	1100	HP
Maximum Horsepower	1210	HP
Brake Specific Fuel Consumption	10,600	Btu/Bhp-hr
Total Heat Input	11.66	MMBtu/hr
Maximum Heat Input	12.83	MMBtu/hr
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	100.14	MMscf/yr
	12574.5	scf/hr based on maximum heat input
Quantity	4	

Pollutant	Emission Factor	Emission Rate			Emission Factor Reference
	lb/MMBtu	lb/hr[1]	ton/yr (1 engine)	ton/yr (4 engines)	
NO_x	2.21	28.35	112.87	451.47	AP-42 Table 3.2-3 (7/00) - 4SRB
CO	3.72	47.71	189.98	759.93	AP-42 Table 3.2-3 (7/00) - 4SRB
CO_2e	117.1	1,502	5,980	23,921	40 CFR 98 Subpart C
PM_{10}	0.019	0.25	0.99	3.97	AP-42 Table 3.2-3 (7/00) - 4SRB
$PM_{2.5}$	0.019	0.25	0.99	3.97	AP-42 Table 3.2-3 (7/00) - 4SRB
VOC	0.0296	0.38	1.51	6.05	AP-42 Table 3.2-3 (7/00) - 4SRB
SO_2 (Maximum Hourly)	0.0571	0.73			20 grains S / 100 scf
SO_2 (Average Annual)	0.000714		0.04	0.15	0.25 grains S / 100 scf
Formaldehyde	0.0071	0.09	0.36	1.45	Source Test Max -- March 2005
Total HAPs	0.0190	0.24	0.97	3.89	AP-42 Table 3.2-3 (7/00) - 4SRB

1. Maximum hourly emission rate based on maximum horsepower under optimum conditions (10% greater than site rating).

Columbia Gas Transmission, LLC
Kenova Compressor Station

Ingersoll-Rand 410 KVG-1 4SRB Reciprocating Compressor Engines (E05-E08) - With NSCR

Horsepower	1100 HP
Maximum Horsepower	1210 HP
Brake Specific Fuel Consumption	10,600 Btu/Bhp-hr
Total Heat Input	11.66 MMBtu/hr
Maximum Heat Input	12.83 MMBtu/hr
Operating Hours	8760 hr/yr
Natural Gas Heat Content	1020 Btu/scf
Fuel Consumption	100.14 MMscf/yr
	12574.5 scf/hr based on maximum heat input
Quantity	4

Pollutant	Emission Factor	Emission Rate			Emission Factor Reference
	lb/MMBtu	lb/hr[1]	ton/yr (1 engine)	ton/yr (4 engines)	
NO_x	2.21	28.35	112.87	451.47	AP-42 Table 3.2-3 (7/00) - 4SRB
CO	0.93	11.93	47.50	189.98	AP-42 Table 3.2-3 (7/00) - 4SRB; 75% Reduction[2]
CO_2e	117.1	1,502	5,980	23,921	40 CFR 98 Subpart C
PM_{10}	0.019	0.25	0.99	3.97	AP-42 Table 3.2-3 (7/00) - 4SRB
$PM_{2.5}$	0.019	0.25	0.99	3.97	AP-42 Table 3.2-3 (7/00) - 4SRB
VOC	0.0207	0.27	1.06	4.23	AP-42 Table 3.2-3 (7/00) - 4SRB; 30% Reduction[2]
SO_2 (Maximum Hourly)	0.0571	0.73			20 grains S / 100 scf
SO_2 (Average Annual)	0.000714		0.04	0.15	0.25 grains S / 100 scf
Formaldehyde	0.0071	0.09	0.36	1.45	Source Test Max -- March 2005
Total HAPs	0.0190	0.24	0.97	3.89	AP-42 Table 3.2-3 (7/00) - 4SRB

1. Maximum hourly emission rate based on maximum horsepower under optimum conditions (10% greater than site rating).
2. Reduction as required by 40 CFR 63 Subpart ZZZZ Table 5 Item 14.

Columbia Gas Transmission, LLC
Kenova Compressor Station

Waukesha VGF-H24GL Emergency Generator (G3)

Horsepower	500	HP
Maximum Horsepower	550	HP
Brake Specific Fuel Consumption	9500	Btu/Bhp-hr
Total Heat Input	4.75	MMBtu/hr
Maximum Heat Input	5.23	MMBtu/hr
Operating Hours	500	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	2.33	MMscf/yr
	5122.5	scf/hr based on maximum heat input

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/bhp-hr	lb/MMBtu	lb/hr[1]	ton/yr	
NO_x	2.31E-03		1.27	0.29	Vendor Data
CO	2.86E-03		1.57	0.36	Vendor Data
CO_2e		117.1	612	139	40 CFR 98 Subpart C
PM_{10}		0.010	0.05	0.01	AP-42 Table 3.2-2 (7/00) - 4SLB
$PM_{2.5}$		0.010	0.05	0.01	AP-42 Table 3.2-2 (7/00) - 4SLB
VOC	1.65E-03		0.91	0.21	Vendor Data
SO_2 (Maximum Hourly)		0.0571	0.30		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		8.48E-04	0.25 grains S / 100 scf
Formaldehyde		0.05280	0.28	0.06	AP-42 Table 3.2-2 (7/00) - 4SLB
Total HAPs		0.07220	0.38	0.09	AP-42 Table 3.2-2 (7/00) - 4SLB

1. Maximum hourly emission rate based on maximum horsepower under optimum conditions (10% greater than site rating).

Columbia Gas Transmission, LLC
Kenova Compressor Station

Natural Gas-Fired Boiler (BL2)

Heat Input	6.30	MMBtu/hr
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	54.11	MMscf/yr
	6176.5	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO_x	100	0.098	0.62	2.71	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.52	2.27	AP-42 Table 1.4-1 (7/98)
CO_2e		117.1	738	3,231	40 CFR 98 Subpart C
PM_{10}	7.6	0.007	0.05	0.21	AP-42 Table 1.4-2 (7/98)
$PM_{2.5}$	7.6	0.007	0.05	0.21	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	0.03	0.15	AP-42 Table 1.4-2 (7/98)
SO_2 (Maximum Hourly)		0.0571	0.36		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		0.02	0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	4.63E-04	2.03E-03	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	1.17E-02	0.05	AP-42 Table 1.4-3 & 4 (7/98)

Columbia Gas Transmission, LLC
Kenova Compressor Station

BS&B Line Heater (H1)

Heat Input	1.50	MMBtu/hr
Operating Hours	8760	hr/yr
Natural Gas Heat Content	1020	Btu/scf
Fuel Consumption	12.88	MMscf/yr
	1470.6	scf/hr

Pollutant	Emission Factor		Emission Rate		Emission Factor Reference
	lb/MMscf	lb/MMBtu	lb/hr	ton/yr	
NO_x	100	0.098	0.15	0.64	AP-42 Table 1.4-1 (7/98)
CO	84	0.082	0.12	0.54	AP-42 Table 1.4-1 (7/98)
CO_2e		117.1	176	769	40 CFR 98 Subpart C
PM_{10}	7.6	0.007	0.01	0.05	AP-42 Table 1.4-2 (7/98)
$PM_{2.5}$	7.6	0.007	0.01	0.05	AP-42 Table 1.4-2 (7/98)
VOC	5.5	0.005	8.09E-03	0.04	AP-42 Table 1.4-2 (7/98)
SO_2 (Maximum Hourly)		0.0571	0.09		20 grains S / 100 scf
SO_2 (Average Annual)		0.000714		4.69E-03	0.25 grains S / 100 scf
Formaldehyde	0.075	0.00007	1.10E-04	4.83E-04	AP-42 Table 1.4-3 (7/98)
Total HAPs	1.89	0.00185	2.78E-03	0.01	AP-42 Table 1.4-3 & 4 (7/98)

Attachment O

Monitoring / Recordkeeping / Reporting / Testing Plans

Monitoring/Recordkeeping/Reporting/Testing Plans

Emergency Generator (G3)

Columbia complies with the required work practice standards as follows:

- Change oil and filter every 500 hours of operation or annually, whichever comes first (or perform oil analysis at same frequency);
- Inspect spark plugs every 1,000 hours of operation or annually, whichever comes first, and replace as necessary; and
- Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.

Records of the operating hours recorded through the non-resettable hour meter are maintained.

Reciprocating Internal Combustion Engines (E01 through E04)

Columbia complies with the required work practice standards as follows:

- Change oil and filter every 4,320 hours of operation or annually, whichever comes first (or perform oil analysis at same frequency);
- Inspect spark plugs every 4,320 hours of operation or annually, whichever comes first, and replace as necessary; and
- Inspect all hoses and belts every 4,320 hours of operation or annually, whichever comes first, and replace as necessary.

Reciprocating Internal Combustion Engines (E05 through E08)

Columbia has installed non-selective catalytic reduction (NSCR) to reduce HAP emissions. As specified in 40 CFR §63.6640(c), Columbia conducts an annual compliance demonstration to show that the average reduction of emissions of CO is 75% or more, or the CO concentration is less than or equal to 270 ppmvd at 15% O2, or the average reduction of emissions of THC is 30% or more. In addition, Columbia automatically shuts down the engine if the catalyst inlet temperature exceeds 1250 °F.

A compliance report are submitted semiannually, outlining the results of the annual compliance demonstration.

Attachment P

Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Columbia Gas Transmission LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Permit Modification for its existing natural gas compression station located on Route 1, Kenova, in Wayne County, West Virginia. The latitude and longitude coordinates are: 38° 22' 15.34" N and 82° 35' 32.07" W.

There will be a reduction in carbon monoxide (CO) and volatile organic compound (VOC) emissions due to this modification; potential to discharge the following Regulated Air Pollutants will be: CO at 232.4 tons per year, Nitrogen Oxides at 1,341.6 tons per year, PM10 and PM2.5 at 18.5 tons per year, Sulfur Dioxide at 0.38 tons per year, VOC at 39.9 tons per year, Carbon Dioxide Equivalents (CO2e) at 62,527 tons per year, and Formaldehyde at 9.5 tons per year.

Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 24th day of June, 2015.

By: Columbia Gas Transmission LLC
Leland Johnston
Manager of Operations
485 Industrial Road
St. Albans, WV 25177-1831

Attachment R

Delegation of Authority

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone: 304 926 0475 • FAX: 304 926 0479

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

July 27, 2011

CERTIFIED MAIL
91 7108 2133 3936 1583 6144

Mr. Victor M. Gaglio
Senior Vice-President of Operations
Columbia Gas Transmission
1700 MacCorkle Avenue, S.E.
Charleston, WV 25314

Re: Delegation of Authority Confirmation

Dear Mr. Gaglio:

Based on your letter, dated July 22, 2011, the Division of Air Quality (DAQ) hereby acknowledges the titles of Regional Director and Manager of Operations as delegated authorized representatives for the facilities listed below.

Company Name	Facility	Facility ID No.
Columbia Gas Transmission, LLC	Horse Creek Station	005-00039
Columbia Gas Transmission, LLC	Frametown Station	007-00100
Columbia Gas Transmission, LLC	Glenville Station	021-00001
Columbia Gas Transmission, LLC	Lost River Station	031-00002
Columbia Gas Transmission, LLC	Hardy Station	031-00031
Columbia Gas Transmission, LLC	Ripley Station	035-00003
Columbia Gas Transmission, LLC	Lanham Station	039-00047
Columbia Gas Transmission, LLC	Clendenin Station	039-00048
Columbia Gas Transmission, LLC	Coco Station	039-00049
Columbia Gas Transmission Corporation	Walgrove Station	039-00074
Columbia Gas Transmission Corporation	Cobb Station	039-00100
Columbia Gas Transmission Corporation	Hunt Station	039-00101
Columbia Gas Transmission Corporation	Charleston Office	039-00154
Columbia Gas Transmission Corporation	Clendenin Office	039-00546
Columbia Gas Transmission, LLC	Hubball Station	043-00002
Columbia Gas Transmission Corporation	Nye Station	043-00011
Columbia Gas Transmission, LLC	Hamlin Station	043-00027
Columbia Gas Transmission, LLC	Majorsville Station	051-00025
Columbia Gas Transmission, LLC	Adaline Station	051-00100

Company Name	Facility	Facility ID No.
Columbia Gas Transmission, LLC	Seneca Station	071-00008
Columbia Gas Transmission, LLC	Terra Alta Station	077-00017
Columbia Gas Transmission, LLC	Glady Station	083-00017
Columbia Gas Transmission, LLC	Files Creek Station	083-00019
Columbia Gas Transmission, LLC	Flat Top Station	089-00004
Columbia Gas Transmission, LLC	Cleveland Station	097-00009
Columbia Gas Transmission, LLC	Ceredo Station	099-00013
Columbia Gas Transmission, LLC	Kenova Station	099-00014
Columbia Gas Transmission, LLC	Smithfield Station	103-00010
Columbia Gas Transmission, LLC	Rockport Station	107-00100
Columbia Gas Transmission, LLC	Huff Creek Station	109-00021

Should you have any questions or comments, please feel free to contact our office at the address or telephone number listed above.

Sincerely,

John A. Benedict
Director

JAB/sch

cc: Joe Morgan
Megan Murphy
File Room

Attachment S

Title V Permit Revision Information

Attachment S

Title V Permit Revision Information

1. New Applicable Requirements Summary	
Mark all applicable requirements associated with the changes involved with this permit revision:	
☐ SIP	☐ FIP
☐ Minor source NSR (45CSR13)	☐ PSD (45CSR14)
☐ NESHAP (45CSR15)	☐ Nonattainment NSR (45CSR19)
☐ Section 111 NSPS (Subpart(s)_____)	☒ Section 112(d) MACT standards (Subpart(s)_ ZZZZ_____)
☐ Section 112(g) Case-by-case MACT	☐ 112(r) RMP
☐ Section 112(i) Early reduction of HAP	☐ Consumer/commercial prod. reqts., section 183(e)
☐ Section 129 Standards/Reqts.	☐ Stratospheric ozone (Title VI)
☐ Tank vessel reqt., section 183(f)	☐ Emissions cap 45CSR§30-2.6.1
☐ NAAQS, increments or visibility (temp. sources)	☐ 45CSR27 State enforceable only rule
☐ 45CSR4 State enforceable only rule	☐ Acid Rain (Title IV, 45CSR33)
☐ Emissions Trading and Banking (45CSR28)	☐ Compliance Assurance Monitoring (40CFR64) (1)
☐ NO_x Budget Trading Program Non-EGUs (45CSR1)	☐ NO_x Budget Trading Program EGUs (45CSR26)

(1) If this box is checked, please include **Compliance Assurance Monitoring (CAM) Form(s)** for each Pollutants Specific Emission Unit (PSEU) (See Attachment H to Title V Application). If this box is not checked, please explain why **Compliance Assurance Monitoring** is not applicable:

This regulation does not apply because engines E05 through E08 are subject to NESHAP Subpart ZZZZ which was promulgated after 1990 as discussed in Attachment D.

2. Non Applicability Determinations

List all requirements, which the source has determined not applicable to this permit revision and for which a permit shield is requested. The listing shall also include the rule citation and a rationale for the determination.

N/A

☐ **Permit Shield Requested** *(not applicable to Minor Modifications)*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

3. Suggested Title V Draft Permit Language

Are there any changes involved with this Title V Permit revision outside of the scope of the NSR Permit revision? ☐ Yes ☒ No If Yes, describe the changes below.

Also, please provide **Suggested Title V Draft Permit language** for the proposed Title V Permit revision (including all applicable requirements associated with the permit revision and any associated monitoring /recordkeeping/ reporting requirements), OR attach a marked up pages of current Title V Permit. Please include appropriate citations (Permit or Consent Order number, condition number and/or rule citation (e.g. 45CSR§7-4.1)) for those requirements being added / revised.

4. Active NSR Permits/Permit Determinations/Consent Orders Associated With This Permit Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	MM/DD/YYYY	
	/ /	
	/ /	

5. Inactive NSR Permits/Obsolete Permit or Consent Orders Conditions Associated With This Revision

Permit or Consent Order Number	Date of Issuance	Permit/Consent Order Condition Number
	MM/DD/YYYY	
	/ /	
	/ /	

6. Change in Potential Emissions

Pollutant	Change in Potential Emissions (+ or -), TPY
NO_x	0.00
CO	-570.0
VOC	-1.81
PM_{10}	0.00
SO_2	0.00
Formaldehyde	0.00

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

7. Certification For Use Of Minor Modification Procedures ***(Required Only for Minor Modification Requests)***

Note	*This certification must be signed by a responsible official. Applications without a signed certification will be returned as incomplete. The criteria for allowing the use of Minor Modification Procedures are as follows*

i. Proposed changes do not violate any applicable requirement;

ii. Proposed changes do not involve significant changes to existing monitoring, reporting, or recordkeeping requirements in the permit;

iii. Proposed changes do not require or change a case-by-case determination of an emission limitation or other standard, or a source-specific determination for temporary sources of ambient air quality impacts, or a visibility increment analysis;

iv. Proposed changes do not seek to establish or change a permit term or condition for which there is no underlying applicable requirement and which permit or condition has been used to avoid an applicable requirement to which the source would otherwise be subject (synthetic minor). Such terms and conditions include, but are not limited to a federally enforceable emissions cap used to avoid classification as a modification under any provision of Title I or any alternative emissions limit approved pursuant to regulations promulgated under § 112(j)(5) of the Clean Air Act;

v. Proposed changes do not involve preconstruction review under Title I of the Clean Air Act or 45CSR14 and 45CSR19;

vi. Proposed changes are not required under any rule of the Director to be processed as a significant modification;

Notwithstanding subparagraph 45CSR§30-6.5.a.1.A. (items i through vi above), minor permit modification procedures may be used for permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, to the extent that such minor permit modification procedures are explicitly provided for in rules of the Director which are approved by the U.S. EPA as a part of the State Implementation Plan under the Clean Air Act, or which may be otherwise provided for in the Title V operating permit issued under 45CSR30.

Pursuant to 45CSR§30-6.5.a.2.C., the proposed modification contained herein meets the criteria for use of Minor permit modification procedures as set forth in Section 45CSR§30-6.5.a.1.A. The use of Minor permit modification procedures are hereby requested for processing of this application.

(Signed):	*(Please use blue ink)*	Date:	06 / 30 / 15 *(Please use blue ink)*
Named (typed):	**Leland Johnston**	Title:	**Manager of Operations**

Note: Please check if the following included (if applicable):

☐	Compliance Assurance Monitoring Form(s)
☐	Suggested Title V Draft Permit Language

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone