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ONEOK
ROCKIES MIDSTREAM
A SUBSIDIARY OF ONEOK PARTNERS

SUBMITTED ELECTRONICALLY VIA CERIS

October 2, 2023

Mr. Jim Semerad
North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58501-1947

ONEOK ROCKIES MIDSTREAM, L.L.C.
BOULDER COMPRESSOR STATION
PERMIT TO CONSTRUCT

Dear Mr. Semerad,

ONEOK Rockies Midstream, L.L.C. (ORM) proposes to construct the Boulder Compressor Station, a new facility in Williams County. ORM submits this Permit to Construct application to authorize construction of the facility, which will be a minor source for criteria pollutants.

Boulder Compressor Station will consist of three (3) 2,500-hp Caterpillar G3608 compressor engines, three (3) 400-bbl condensate tanks, one (1) 400-bbl produced water tanks, one (1) 400-bbl methanol tank, and one (1) process/VOC flare for controlling the condensate tank vapor and process blowdowns. Associated emission sources include condensate truck loading, fugitive emissions and other miscellaneous vents and blowdowns. Since tank emissions for each tank will be less than 6 tons per year, ORM requests a federally enforceable emission limitation of 5.99 tons per year per tank so that they will be exempt under NSPS 40 CFR Part 60 Subpart OOOOa.

If you need additional information or have any questions, please call me at 918-588-7862 or Joshua.Hills@oneok.com.

Sincerely,

Joshua Hills
Environmental Specialist

xc: V. Danzeisen/L. Weltikol/D. Vande Bossche/R. Brown/K. Hanner (.pdf)
Tulsa Environmental Files – Boulder Compressor Station – Permit Actions

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Permit to Construct

Boulder Compressor Station

ONEOK Rockies Midstream, L.L.C.

ONEOK
ROCKIES MIDSTREAM
A SUBSIDIARY OF ONEOK PARTNERS

Submitted to NDDEQ Air Quality Division
September 2023

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

Introduction

ONEOK Rockies Midstream, L.L.C. (ORM) proposes to construct the Boulder Compressor Station, a new facility in Williams County. ORM submits this Permit to Construct to authorize construction of the facility, which will be a minor source of criteria pollutants.

Facility Equipment

Boulder Compressor Station will consist of three (3) 2,500-hp Caterpillar G3608 compressor engines, three (3) 400-bbl condensate tanks, one (1) 400-bbl produced water tank, one (1) 400-bbl methanol tank, and one (1) process/VOC flare for controlling tank emissions and emergency relief venting from all equipment. Associated emission sources include condensate truck loading, fugitive emissions and miscellaneous vents and blowdowns.

Process Description

A pipeline gathering system transports field natural gas from wells through an inlet separator where free liquids are removed and stored in the condensate tanks. Natural gas then passes through a suction header and is routed to the compressors, which boost gas pressure. The compressor units discharge natural gas into a pipeline for transmission. Condensate is transported off-site via tank truck for sales. Emissions from fugitive components and miscellaneous vents and blowdowns also occur at the facility. An emergency flare utilized is to combust compressor blowdowns and for emergency upsets.

Regulatory Applicability

The facility is a natural gas compressor station that falls under the North American Industrial Classification System (NAICS) code 211130 (formerly Standard Industrial Classification (SIC) 1311).

New Source Performance Standards 40 CFR Part 60 Subpart JJJJ, Stationary Spark Ignition Internal Combustion Engines (SI-ICE) promulgates emission standards for all new SI engines ordered after June 12, 2006, and all SI engines modified or reconstructed after June 12, 2006, regardless of size. The specific emission standards (either in g/hp-hr or as a concentration limit) vary based on engine class, engine power rating, lean-burn or rich-burn, fuel type, duty (emergency or non-emergency), and various manufacture dates. The compressor engines were manufactured after July 1, 2010; therefore, are subject to the Stage 2 emissions limitations of this subpart.

New Source Performance Standards 40 CFR Part 60 Subpart OOOO, Crude Oil and Natural Gas Production, Transmission and Distribution, establishes emission standards for the following equipment that commences construction, modification, or reconstruction after August 23, 2011 and on or before September 18, 2015 at crude oil and natural gas production, transmission or distribution facilities:

1. Each single gas well;
2. Single centrifugal compressors using wet seals located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
3. Single reciprocating compressors located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment;
4. Single continuous bleed natural gas driven pneumatic controllers with a natural gas bleed rate greater than 6 SCFH, located between the wellhead and the point of custody transfer to the natural gas transmission and storage segment and not located at a natural gas processing plant;
5. Single continuous bleed natural gas driven pneumatic controllers located at a natural gas processing plant;

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6. Single storage vessels located in the oil and natural gas production segment, natural gas processing segment, or natural gas transmission and storage segment with the potential for VOC emissions equal to or greater than 6 tons per year;
7. All equipment, except compressors, within a process unit at an onshore natural gas processing plant;
8. Sweetening units located at onshore natural gas processing plants.

All potentially affected equipment is constructed after September 18, 2015 and is not subject to this subpart.

New Source Performance Standards 40 CFR Part 60 Subpart OOOOa, Crude Oil and Natural Gas Facilities, establishes emission standards for the following equipment that commences construction, modification or reconstruction after September 18, 2015 at crude oil and natural gas production, transmission or distribution facilities:

1. Each single oil or gas well that conducts a completion following hydraulic fracturing or refracturing;
2. Single centrifugal compressors using wet seals that are not located at a well site;
3. Single reciprocating compressors not located at a well site;
4. Single continuous bleed natural gas driven pneumatic controllers with a natural gas bleed rate greater than 6 SCFH, not located at a natural gas processing plant;
5. Single continuous bleed natural gas driven pneumatic controllers located at a natural gas processing plant;
6. Single storage vessels with the potential for VOC emissions equal to or greater than 6 tons per year;
7. The group of all equipment within a process unit;
8. The group of fugitive emissions equipment at a compressor station;
9. The group of fugitive emissions equipment at a well site;
10. Sweetening units located at onshore natural gas processing plants;
11. Pneumatic pumps at natural gas processing plants and well sites.

Potentially affected equipment includes the reciprocating compressors associated with each of the compressor engines. ORM complies with the requirements for rod packing replacement as required. Any continuous bleed pneumatic controllers at the facility have a bleed rate less than 6 SCFH; therefore, they are not be subject to this subpart. The condensate tanks were constructed after September 18, 2015 but are controlled so their emissions are less than 6 tons per year. The produced water tank is also constructed after September 18, 2015, but the emissions are less than 6 tons per year uncontrolled. ORM requests a federally enforceable emission limitation of 5.99 tons per year for each tank so that they are not subject to this subpart. The facility meets the definition of a new compressor station and therefore is subject to the leak detection requirements of this subpart.

National Emission Standards for Hazardous Air Pollutants 40 CFR Part 63 Subpart ZZZZ, Reciprocating Internal Combustion Engines (RICE), affects any existing, new or reconstructed stationary RICE located at a major or area source of HAP emissions. Owners and operators of new or reconstructed engines at area sources must meet the requirements of Subpart ZZZZ by complying with either 40 CFR Part 60 Subpart IIII (for CI engines) or 40 CFR Part 60 Subpart JJJJ (for SI engines). Based on emission calculations, this facility is a minor source of HAP. Since the compressor engines are subject to 40 CFR Part 60 Subpart JJJJ, they automatically satisfy the requirements of Subpart ZZZZ by complying with NSPS Subpart JJJJ. There are no further requirements under Subpart ZZZZ for these engines.

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PERMIT APPLICATION FOR AIR CONTAMINANT SOURCES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8516 (9-2021)

SECTION A - FACILITY INFORMATION

Name of Firm or Organization ONEOK Rockies Midstream, L.L.C.		
Applicant's Name Dick Vande Bossche		
Title Vice President, ONEOK Rockies Midstream Operations	Telephone Number (406) 433-8710	E-mail Address dick.vandebossche@oneok.com
Contact Person for Air Pollution Matters Joshua Hills		
Title Environmental Specialist	Telephone Number (918) 588-7862	E-mail Address Joshua.Hills@oneok.com
Mailing Address (Street & No.) 100 W. Fifth St.		
City Tulsa	State OK	ZIP Code 74103
Facility Name Boulder Compressor Station		
Facility Address (Street & No.) 144th Avenue NW		
City Round Prairie	State ND	ZIP Code 58801

County Williams	Coordinates NAD 83 in Decimal Degrees (to forth decimal degree)	
	Latitude 48.16969400	Longitude -103.99038700

Legal Description of Facility Site

Quarter	Quarter	Section	Township	Range
SW	SW	7	154N	103W

Land Area at Facility Site 10 Acres (or) _____ Sq. Ft.	MSL Elevation at Facility 2214 ft

SECTION B – GENERAL NATURE OF BUSINESS

Describe Nature of Business	North American Industry Classification System Number	Standard Industrial Classification Number (SIC)
Natural Gas Gathering	211130	1311

SECTION C – GENERAL PERMIT INFORMATION

Type of Permit? ☒ Permit to Construct (PTC) ☐ Permit to Operate (PTO)

If application is for a Permit to Construct, please provide the following data:

Planned Start Construction Date	Planned End Construction Date
11/2023	04/2024

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SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION

		Permit to Construct				Minor Source Permit to Operate						
Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
C-1	2,500-hp Caterpillar G3608 Engine	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C-2	2,500-hp Caterpillar G3608 Engine	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
C-3	2,500-hp Caterpillar G3608 Engine	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
FL-1	Process/VOC Flare	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
TK-1 - TK-3	Three 400-bbl Condensate Tanks	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
WTK-1	One 400-bbl Produced Water Tank	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
MTK-1	One 400-bbl Methanol Tank	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
TL-1	Truck Loading	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
FUG	Fugitive Emissions	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Add additional pages if necessary

SECTION D2 – APPLICABLE REGULATIONS

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)
Facility-wide	NSPS OOOOa (Fugitive Monitoring)
C-1 - C-3	NSPS OOOOa (Compressor Rod Packing)
C-1 - C-3	NSPS JJJJ/NESHAP ZZZZ

SECTION E – TOTAL POTENTIAL EMISSIONS

Pollutant	Amount (Tons Per Year)
NO_x	73.48
CO	84.21
PM	2.41

SECTION D – SOURCE IDENTIFICATION AND CATEGORY OF EACH SOURCE INCLUDED ON THIS PERMIT APPLICATION

		Permit to Construct				Minor Source Permit to Operate						
Your Source ID Number	Source or Unit (Equipment, Machines, Devices, Boilers, Processes, Incinerators, Etc.)	New Source	Existing Source Modification	Existing Source Expansion	Existing Source Change of Location	New Source	Existing Source Initial Application	Existing Source After Modification	Existing Source After Expansion	Existing Source After Change of Location	Existing Source After Change of Ownership	Other
BD	Misc. Venting and Blowdowns	☑	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
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		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
		☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

Add additional pages if necessary

SECTION D2 – APPLICABLE REGULATIONS

Source ID No.	Applicable Regulations (NSPS/MACT/NESHAP/etc.)

SECTION E – TOTAL POTENTIAL EMISSIONS

Pollutant	Amount (Tons Per Year)
NO_x	
CO	
PM	

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Pollutant	Amount (Tons Per Year)
PM_{10} (filterable and condensable)	2.41
$PM_{2.5}$ (filterable and condensable)	2.41
SO_2	0.14
VOC	88.18
GHG (as CO_2e)	36224.61
Largest Single HAP	5.78
Total HAPS	9.67

*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee is used provide spec sheet.

SECTION F1 – ADDITIONAL FORMS

Indicate which of the following forms are attached and made part of the application

☒ Air Pollution Control Equipment (SFN 8532)	☐ Fuel Burning Equipment Used for Indirect Heating (SFN 8518)
☐ Construct/Operate Incinerators (SFN 8522)	☐ Hazardous Air Pollutant (HAP) Sources (SFN 8329)
☐ Natural Gas Processing Plants (SFN 11408)	☐ Manufacturing or Processing Equipment (SFN 8520)
☐ Glycol Dehydration Units (SFN 58923)	☒ Volatile Organic Compounds Storage Tank (SFN 8535)
☒ Flares (SFN 59652)	☒ Internal Combustion Engines and Turbines (SFN 8891)
☐ Grain, Feed, and Fertilizer Operations (SFN 8524)	☐ Oil/Gas Production Facility Registration (SFN 14334)

SECTION F2 – OTHER ATTACHMENTS INCLUDED AS PART OF THIS APPLICATION

1.	Process Description and Regulatory Applicability	4.	Emission Calculations
2.	Area Map	5.	Support Documentation
3.	Process Flow Diagram	6.	

I, the undersigned applicant, am fully aware that statements made in this application and the attached exhibits and statements constitute the application for Permit(s) to Construct and/or Operate Air Contaminant sources from the North Dakota Department of Environmental Quality and certify that the information in this application is true, correct and complete to the best of my knowledge and belief. Further, I agree to comply with the provisions of Chapter 23.1-06 of the North Dakota Century Code and all rules and regulations of the Department, or revisions thereof. I also understand the permit is nontransferable and, if granted a permit, I will promptly notify the Department upon sale or legal transfer of this permitted establishment.

Signature	Date
DocuSigned by: Dick Vande Bossche 67B797C4193640F...	10/5/2023

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INSTRUCTIONS

SITE PLANS TO BE ATTACHED TO APPLICATION:

Prepare and attach a plot plan drawn to scale or properly dimensioned, showing at least the following:

a. The property involved and the outlines and heights of all buildings on the property. Identify property lines plainly. Also, indicate if there is a fence around the property that prevents public access.

b. Location and identification of all existing or proposed equipment, manufacturing processes, etc., and points of emission or discharge of air contaminants to the atmosphere.

c. Location of the facility or property with respect to the surrounding area, including residences, businesses and other permanent structures, streets and roadways. Identify all such structures and roadways. Indicate direction (**NORTH**) on the drawing and the prevailing wind direction.

EQUIPMENT PLANS AND SPECIFICATIONS FOR PERMIT TO CONSTRUCT:

Supply plans and specifications, including as a minimum an assembly drawing, dimensioned and to scale, in plan, elevation and as many sections as are needed to show clearly the design and operation of the equipment and the means by which air contaminants are controlled.

The following must be shown:

a. Size and shape of the equipment. Show exterior and interior dimensions and features.

b. Locations, sizes, and shape details of all features which may affect the production, collection, conveying, or control of air contaminants of any kind, location, size, and shape details concerning all material handling equipment.

c. All data and calculations used in selecting or designing the equipment.

d. Horsepower rating of all internal combustion engines driving the equipment.

NOTE: **STRUCTURAL DESIGN CALCULATIONS AND DETAILS ARE NOT REQUIRED.** WHEN STANDARD COMMERCIAL EQUIPMENT IS TO BE INSTALLED, THE MANUFACTURER'S CATALOG DESCRIBING THE EQUIPMENT MAY BE SUBMITTED IN LIEU OF ITEMS a, b, c, and d OF ABOVE, WHICH THE CATALOG COVERS. ALL INFORMATION REQUIRED ABOVE THAT THE CATALOG DOES NOT CONTAIN MUST BE SUBMITTED BY THE APPLICANT.

ADDITIONAL INFORMATION MAY BE REQUIRED:

If the application is signed by an authorized representative of the owner, a LETTER OF AUTHORIZATION must be attached to the application.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
4201 Normandy Street, 2nd Floor
Bismarck, ND 58503-1324
(701) 328-5188

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PERMIT APPLICATION FOR INTERNAL COMBUSTION ENGINES AND TURBINES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8891 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station

SECTION B – FACILITY AND UNIT INFORMATION

Source ID Number (From form SFN 8516): C-1 - C-3 (Each)

Type of Unit (check all that apply):

- ■ Stationary Natural Gas-Fired Engine
- ☐ Stationary Diesel and Dual Fuel Engine
- ☐ Stationary Gasoline Engine
- ☐ Stationary Natural Gas-Fired Turbine
- ☐ Emergency Use Only
- ■ Non-Emergency Use
- ☐ Peaking
- ☐ Demand Response
- ☐ Other – Specify:

SECTION C – MANUFACTURER DATA

Make	Model	Date of Manufacture
Caterpillar	G3608 ADEM4	2023

Reciprocating Internal Combustion Engine

■ Spark Ignition ☐ Compression Ignition

■ 4 Stroke ☐ 2 Stroke ☐ Rich Burn ■ Lean Burn

Maximum Rating (BHP @ rpm)	Operating Capacity (BHP @ rpm)
2,500-HP	2,500-HP

Engine Subject to:
☐ 40 CFR 60, Subpart IIII ■ 40 CFR 60, Subpart JJJJ ■ 40 CFR 63, Subpart ZZZZ
☐ 40 CFR 60, Subpart OOOO ☐ 40 CFR 60, Subpart OOOOa

Turbine — Dry Low Emissions? ☐ Yes ☐ No

Heat Input (MMBtu/hr)	Maximum Rating (HP)	75% Rating (HP)	Efficiency

Turbine Subject to: ☐ 40 CFR 60, Subpart GG ☐ 40 CFR 60, Subpart KKKK

SECTION D – FUELS USED

Natural Gas (10^6 cu ft/year)	Percent Sulfur	Percent H_2S
147.159		
Oil (gal/year)	Percent Sulfur	Grade No.
LP Gas (gal/year)	Other – Specify:	

SECTION E – NORMAL OPERATING SCHEDULE

Hours Per Day	Days Per Week	Weeks Per Year	Hours Per Year	Peak Production Season (if any)
24	7	52	8760	

SECTION F – STACK PARAMETERS

Emission Point ID Number		Stack Height Above Ground Level (feet)	
		30	
Stack Diameter (feet at top)	**Gas Discharged (SCFM)**	**Exit Temp (°F)**	**Gas Velocity (FPS)**
4.5	10,512	1,117	11.02

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SECTION G – EMISSION CONTROL EQUIPMENT

Is any emission control equipment installed on this unit?
☐ No ■ Yes – Complete and attach form SFN 8532

SECTION H – MAXIMUM AIR CONTAMINANTS EMITTED

Pollutant	Maximum Pounds Per Hour	Amount (Tons Per Year)	Basis of Estimate*
NO_x	5.51 (Each)	24.14 (Each)	Manufacturer data
CO	6.21 (Each)	27.22 (Each)	Manufacturer data
PM	0.18 (Each)	0.79 (Each)	AP-42 Table 3.2-2 (7/00)
PM_{10} (filterable and condensable)	0.18 (Each)	0.79 (Each)	AP-42 Table 3.2-2 (7/00)
$PM_{2.5}$ (filterable and condensable)	0.18 (Each)	0.79 (Each)	AP-42 Table 3.2-2 (7/00)
SO_2	0.01 (Each)	0.05 (Each)	AP-42 Table 3.2-2 (7/00)
VOC	3.86 (Each)	16.92 (Each)	Manufacturer data
GHG (as CO_2e)	2,614.65 (Each)	11,452.17 (Each)	40 CFR Tables C-1 and C-2
Largest Single HAP	0.44 (Each)	1.93 (Each)	Formaldehyde: Manufacturer data
Total HAPS	0.55 (Each)	2.39 (Each)	AP-42 Table 3.2-2 (7/00)

* If performance test results are available for the unit, submit a copy of test with this application, if manufacture data used, submit manufacturers specification sheets.

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION RULES AND REGULATIONS?

■ YES ☐ NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants, or other items.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

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PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8532 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must also include forms SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station
Source ID No. of Equipment being Controlled C-1 - C-3 (Each)	

SECTION B – EQUIPMENT

Type: ☐ Cyclone ☐ Multiclone ☐ Baghouse ☐ Electrostatic Precipitator
☐ Wet Scrubber ☐ Spray Dryer ☐ Flare/Combustor
☒ Other – Specify: NSCR

Name of Manufacturer	Model Number	Date to Be Installed
Miratech	MECB-OX-SB2700-2421-233-291	TBD

Application:
☐ Boiler ☐ Kiln ☒ Engine ☐ Other – Specify:

Pollutants Removed	NOx	CO	CH2O	VOC
Design Efficiency (%)	N/A			
Operating Efficiency (%)				

Describe method used to determine operating efficiency:
Data provided by manufacturer

SECTION CD – GAS CONDITIONS

Gas Conditions			Inlet	Outlet
Gas Volume (SCFM; 68°F; 14.7 psia)				
Gas Temperature (°F)				
Gas Pressure (in. H_2O)				
Gas Velocity (ft/sec)				
Pollutant Concentration (Specify Pollutant and Unit of Concentration)	Pollutant	Unit of Concentration		
	NOx	g/hp-hr	1.0	1.0
	CO	g/hp-hr	4.51	1.13
	CH2O	g/hp-hr	0.17	0.08
	VOC	g/hp-hr	1.46	0.70
Pressure Drop Through Gas Cleaning Device (in. H_2O)				

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INSTRUCTIONS FOR PERMIT APPLICATION FOR AIR POLLUTION CONTROL EQUIPMENT

1. Complete this form for each piece of equipment or process, which has air pollution control equipment installed, described in the following Permit Applications: Hazardous Air Pollutant (HAP) Sources (SFN 8329), Fuel Burning Equipment for Indirect Heating (SFN 8518); Manufacturing or Processing Equipment (SFN 8520); Incinerators/Crematories (SFN 8522); Internal Combustion Engines and Turbines (SFN 8891); and Glycol Dehydration Units (SFN 58923). Print or type all information. If an item does not apply, place NA in the appropriate space.

2. Type of Equipment - If the type is not one of those listed; provide enough information so the operating principal of the equipment can be determined.

3. List each pollutant which the device is intended to control, the efficiency of removal intended by the designer, and the actual efficiency under operating conditions.

4. Please attach the following:

   - A brief description and sketch of the air pollution control device if it is of unusual design or used in conjunction with other control devices. Show any bypass of the device and specify the conditions under which the bypass is used.

   - A description of what is done with collected air contaminants from the time they are collected until they reach the final disposal point. Include a description of the transportation methods used.

   - If a stack test has been conducted, attach a copy of the results, date of the test, a description of the techniques used, and the name and address of the organization which performed the test.

5. If the control device is a combustor (e.g.: thermal oxidizer, vapor combustion unit, etc.), include an estimate of potential greenhouse gas emissions (CO_2e).

SUBMIT YOUR APPLICATION WITH ALL SUPPORTING DOCUMENTS, ALONG WITH THE FORMS SPECIFIED IN THE FIRST PARAGRAPH ABOVE, TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

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PERMIT APPLICATION FOR VOLATILE ORGANIC COMPOUNDS STORAGE TANK

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8535 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station

SECTION B – TANK DATA

Source ID Number (From SFN 8516): TK-1

Capacity	Barrels: 400		Gallons: 16,800	
Dimensions	Diameter: 12	Height: 20	Length	Width
Shape	☒ Cylindrical	☐ Spherical	☐ Other – Specify:	
Materials of Construction	(i.e., steel)			
Construction	☐ Riveted	☒ Welded	☐ Other – Specify:	
Color: Tan				
Condition	☒ Good	☐ Fair	☐ Poor	
Status	☒ New Construction	☐ Alteration	☐ Existing (Give Date Constructed):	
Type of Tank	☒ Fixed Roof ☐ Variable Vapor Space ☐ Pressure (low or high)		☐ External Floating ☐ Internal Floating ☐ Other – Specify:	
Type of Roof	☐ Pan	☐ Double Deck	☐ Pontoon	☒ Other – Specify: Cone

Type of Seal	Metallic Shoe Seal	Liquid Mounted Resilient Seal	Vapor Mounted Resilient Seal
	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Shoe Mounted Secondary Seal	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield

SECTION C – TANK CONTENTS

Name all liquids, vapors, gases, or mixtures of such materials to be stored in the tank.
Give density (lbs per gal) or A.P.I.

Natural gas condensate

SECTION D – VAPOR DISPOSAL

☐ Atmosphere ☐ Vapor Recovery Unit ☒ Flare ☐ Enclosed Combustor ☐ Other – Specify:

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

PERMIT APPLICATION FOR VOLATILE ORGANIC COMPOUNDS STORAGE TANK

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8535 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station

SECTION B – TANK DATA

Source ID Number (From SFN 8516)
TK-2, TK-3 (Each)

Capacity	Barrels 400		Gallons 16,800	
Dimensions	Diameter 12	Height 20	Length	Width

Shape	■ Cylindrical	☐ Spherical	☐ Other – Specify:
Materials of Construction	(i.e., steel)		
Construction	☐ Riveted	■ Welded	☐ Other – Specify:
Color Tan			
Condition	■ Good	☐ Fair	☐ Poor
Status	■ New Construction	☐ Alteration	☐ Existing (Give Date Constructed):
Type of Tank	■ Fixed Roof ☐ Variable Vapor Space ☐ Pressure (low or high)		☐ External Floating ☐ Internal Floating ☐ Other – Specify:
Type of Roof	☐ Pan	☐ Double Deck	☐ Pontoon ■ Other – Specify: Cone

Type of Seal	Metallic Shoe Seal	Liquid Mounted Resilient Seal	Vapor Mounted Resilient Seal
	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Shoe Mounted Secondary Seal	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield

SECTION C – TANK CONTENTS

Name all liquids, vapors, gases, or mixtures of such materials to be stored in the tank.
Give density (lbs per gal) or A.P.I.

Natural gas condensate

SECTION D – VAPOR DISPOSAL

☐ Atmosphere ☐ Vapor Recovery Unit ■ Flare ☐ Enclosed Combustor ☐ Other – Specify:

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

SECTION E – VAPOR PRESSURE DATA

psia	
Maximum True Vapor Pressure 12.87 psia	Maximum Reid Vapor Pressure

SECTION F – OPERATIONAL DATA

Maximum Filling Rate (barrels per hour or gallons per hour) 200 bbl/hr (Each)	Vapor Space Outage (See AP-42, 7.1-92, Equation 1-15)
Average Throughput (barrels per day or gallons per day) 58 bbl/day (Each)	Tank Turnovers per Year

SECTION G – SOLUTION STORAGE

If material stored is a solution, supply the following information:	
Name of Solvent	Name of Material Dissolved
Concentration of Material Dissolved (% by weight or % by volume or lbs/gal)	

SECTION H – AIR CONTAMINANATS EMITTED

Pollutant*	Maximum Pounds Per Hour	Tons Per Year	Basis and Calculations for Quantities (Attach separate sheet if needed)
VOC	0.19 (Each)	0.83 (Each)	ProMax Process Simulation
CO2e	0.01 (Each)	0.04 (Each)	ProMax Process Simulation

* Include an estimate of greenhouse gas emissions (CO_2e)

SECTION I – STANDARDS OF PERFORMANCE

Tank subject to: ☐ 40 CFR 60, Subpart K ☐ 40 CFR 60, Subpart Ka ☐ 40 CFR 60, Subpart Kb

☐ 40 CFR 60, Subpart OOOO ☐ 40 CFR 60, Subpart OOOOa

Are the standards of performance for new stationary sources; petroleum liquid storage vessels, 40 CFR Part 60, Subparts K, Ka, and Kb, OOOO, OOOOa being adhered to, where applicable?

☐ Yes ■ No – Explain:

Tank capacities are less than threshold; therefore, NSPS Subpart K, Ka and Kb not applicable. The condensate tanks will be constructed after September 18, 2015, but they will be controlled so their emissions will be less than 6 TPY. Additionally, ORM requests a federally enforceable emission limitation of 5.99 TPY for each tank so they will not be subject to NSPS Subpart OOOOa.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

PERMIT APPLICATION FOR VOLATILE ORGANIC COMPOUNDS STORAGE TANK

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8535 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station

SECTION B – TANK DATA

Source ID Number (From SFN 8516): WTK-1

Capacity	Barrels: 400		Gallons: 16,800	
Dimensions	Diameter: 12	Height: 20	Length	Width

Shape	■ Cylindrical	☐ Spherical	☐ Other – Specify:
Materials of Construction	(i.e., steel)		
Construction	☐ Riveted	■ Welded	☐ Other – Specify:
Color: Tan			
Condition	■ Good	☐ Fair	☐ Poor
Status	■ New Construction	☐ Alteration	☐ Existing (Give Date Constructed):

Type of Tank	■ Fixed Roof ☐ Variable Vapor Space ☐ Pressure (low or high)	☐ External Floating ☐ Internal Floating ☐ Other – Specify:

Type of Roof	☐ Pan	☐ Double Deck	☐ Pontoon	■ Other – Specify: Cone

Type of Seal	Metallic Shoe Seal	Liquid Mounted Resilient Seal	Vapor Mounted Resilient Seal
	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Shoe Mounted Secondary Seal	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield

SECTION C – TANK CONTENTS

Name all liquids, vapors, gases, or mixtures of such materials to be stored in the tank.
Give density (lbs per gal) or A.P.I.

Produced Water - Tanks are assumed to contain 99% produced water and 1% condensate. Therefore, produced water emissions are assumed to be 1% of those calculated for condensate.

SECTION D – VAPOR DISPOSAL

☐ Atmosphere ☐ Vapor Recovery Unit ■ Flare ☐ Enclosed Combustor ☐ Other – Specify:

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

SECTION E – VAPOR PRESSURE DATA

psia	
Maximum True Vapor Pressure 12.87 psia	Maximum Reid Vapor Pressure

SECTION F – OPERATIONAL DATA

Maximum Filling Rate (barrels per hour or gallons per hour) 200 bbl/hr	Vapor Space Outage (See AP-42, 7.1-92, Equation 1-15)
Average Throughput (barrels per day or gallons per day) 190 bbl/day	Tank Turnovers per Year

SECTION G – SOLUTION STORAGE

If material stored is a solution, supply the following information:	
Name of Solvent	Name of Material Dissolved
Concentration of Material Dissolved (% by weight or % by volume or lbs/gal)	

SECTION H – AIR CONTAMINANATS EMITTED

Pollutant*	Maximum Pounds Per Hour	Tons Per Year	Basis and Calculations for Quantities (Attach separate sheet if needed)
VOC	0.01	0.04	ProMax Process Simulation
CO2e	0.02	0.10	ProMax Process Simulation

* Include an estimate of greenhouse gas emissions (CO_2e)

SECTION I – STANDARDS OF PERFORMANCE

Tank subject to: ☐ 40 CFR 60, Subpart K ☐ 40 CFR 60, Subpart Ka ☐ 40 CFR 60, Subpart Kb

☐ 40 CFR 60, Subpart OOOO ☐ 40 CFR 60, Subpart OOOOa

Are the standards of performance for new stationary sources; petroleum liquid storage vessels, 40 CFR Part 60, Subparts K, Ka, and Kb, OOOO, OOOOa being adhered to, where applicable?

☐ Yes ■ No – Explain:

Tank capacities are less than threshold; therefore, NSPS Subpart K, Ka and Kb not applicable. The produced water tanks will be constructed after September 18, 2015, but the emissions will be less than 6 TPY uncontrolled. Additionally, ORM requests a federally enforceable emission limitation of 5.99 TPY for the tank so they will not be subject to this subpart.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

PERMIT APPLICATION FOR VOLATILE ORGANIC COMPOUNDS STORAGE TANK

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 8535 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station

SECTION B – TANK DATA

Source ID Number (From SFN 8516): MTK-1

Capacity	Barrels: 400		Gallons: 16,800	
Dimensions	Diameter: 12	Height: 20	Length	Width

Shape	■ Cylindrical	☐ Spherical	☐ Other – Specify:
Materials of Construction	(i.e., steel)		
Construction	☐ Riveted	■ Welded	☐ Other – Specify:
Color: Tan			
Condition	■ Good	☐ Fair	☐ Poor
Status	■ New Construction	☐ Alteration	☐ Existing (Give Date Constructed):
Type of Tank	■ Fixed Roof ☐ Variable Vapor Space ☐ Pressure (low or high)	☐ External Floating ☐ Internal Floating ☐ Other – Specify:	
Type of Roof	☐ Pan	☐ Double Deck	☐ Pontoon ■ Other – Specify: Cone

Type of Seal	Metallic Shoe Seal	Liquid Mounted Resilient Seal	Vapor Mounted Resilient Seal
	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Shoe Mounted Secondary Seal	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield	☐ Primary Seal Only ☐ With Rim Mounted Seal ☐ With Weather Shield

SECTION C – TANK CONTENTS

Name all liquids, vapors, gases, or mixtures of such materials to be stored in the tank.
Give density (lbs per gal) or A.P.I.

Methanol

SECTION D – VAPOR DISPOSAL

■ Atmosphere ☐ Vapor Recovery Unit ☐ Flare ☐ Enclosed Combustor ☐ Other – Specify:

DocuSign Envelope ID: 65E8CBAA-ED56-4503-A1EA-24B57DDC76AC

SECTION E – VAPOR PRESSURE DATA

psia	
Maximum True Vapor Pressure 12.87 psia	Maximum Reid Vapor Pressure

SECTION F – OPERATIONAL DATA

Maximum Filling Rate (barrels per hour or gallons per hour) 0.78 bbl/hr	Vapor Space Outage (See AP-42, 7.1-92, Equation 1-15)
Average Throughput (barrels per day or gallons per day) 18.7 bbl/day	Tank Turnovers per Year

SECTION G – SOLUTION STORAGE

If material stored is a solution, supply the following information:	
Name of Solvent	Name of Material Dissolved
Concentration of Material Dissolved (% by weight or % by volume or lbs/gal)	

SECTION H – AIR CONTAMINANATS EMITTED

Pollutant*	Maximum Pounds Per Hour	Tons Per Year	Basis and Calculations for Quantities (Attach separate sheet if needed)
VOC	0.04	0.17	AP-42

* Include an estimate of greenhouse gas emissions (CO_2e)

SECTION I – STANDARDS OF PERFORMANCE

Tank subject to: ☐ 40 CFR 60, Subpart K ☐ 40 CFR 60, Subpart Ka ☐ 40 CFR 60, Subpart Kb

☐ 40 CFR 60, Subpart OOOO ☐ 40 CFR 60, Subpart OOOOa

Are the standards of performance for new stationary sources; petroleum liquid storage vessels, 40 CFR Part 60, Subparts K, Ka, and Kb, OOOO, OOOOa being adhered to, where applicable?

☐ Yes ■ No – Explain:

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701) 328-5188

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PERMIT APPLICATION FOR FLARES

NORTH DAKOTA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF AIR QUALITY
SFN 59652 (3-2019)

NOTE: READ INSTRUCTIONS BEFORE COMPLETING THIS FORM.
- Must include SFN 8516 or SFN 52858

SECTION A – GENERAL INFORMATION

Name of Firm or Organization	Facility Name
ONEOK Rockies Midstream, L.L.C.	Boulder Compressor Station

SECTION B - FLARE INFORMATION

Use: ☐ Emergency ☐ Process ■ Both	Subject to NSPS (40 CFR 60.18) ○ Yes ● No	
Emission Point ID FL-1	Height Above Ground Level (ft.) TBD	Diameter at Top (ft.) TBD
Flame Monitor: ■ Thermocouple ☐ Infrared ☐ Ultraviolet ☐ Acoustic ☐ Other:		
Ignition: ■ Automatic ■ Continuous Burning Pilot ■ Other: Electric spark igniter		
Average Btu/1000 scf 1,350	Percent H_2S 0.00%	Maximum Hourly Flow Rate to Flare Max of 1.889 MCF per blowdown event
List source ID numbers controlled by this unit, if any: TK-1 - TK-3, WTK-1, Compressor blowdowns at C-1 - C-3		

SECTION C – AIR CONTAMINANTS EMITTED

Pollutant	Amount (Tons Per Year)	Basis of Estimate*
NO_x	1.06	Stream: AP-42 Table 13.5-1 (2/18) / Pilot: AP-42 Table 1.4-1,-2 (7/98)
CO	2.56	Stream: AP-42 Table 13.5-1 (2/18) / Pilot: AP-42 Table 1.4-1,-2 (7/98)
PM	0.05	Pilot: AP-42 Table 1.4-1, -2 (7/98)
PM_{10} (filterable and condensable)	0.05	Pilot: AP-42 Table 1.4-1, -2 (7/98)
$PM_{2.5}$ (filterable and condensable)	0.05	Pilot: AP-42 Table 1.4-1, -2 (7/98)
SO_2	<0.01	Stream: Stoichiometric / Pilot: AP-42 Table 1.4-1,-2 (7/98)
VOC	0.31	Stream: Mass Balance / Pilot: AP-42 1.4-1,-2 (7/98)
GHG (as CO_2e)	1,524.66	Stream: 40 CFR 98 and Mass Balance / Pilot: 40 CFR 98
Largest Single HAP	0.01	n-Hexane - Stream: Mass Balance / Pilot AP-42 Table 1.4-1,-2 (7/98)
Total HAPS	0.01	Stream: Mass Balance / Pilot: AP-42 Table 1.4-1,-2 (7/98)

*If performance test results are available for the unit, submit a copy of test with this application. If manufacturer guarantee are used provide spec sheet.

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Will flaring of gas comply with applicable Ambient Air Quality Standards? ☒ Yes ☐ No

IS THIS UNIT IN COMPLIANCE WITH ALL APPLICABLE AIR POLLUTION CONTROL RULES AND REGULATIONS?

☒ YES ☐ NO

If "NO" a Compliance Schedule (SFN 61008) must be completed and attached.

Attach and label separate sheet(s) if you need more space to explain any system or answers or to provide complete listings of Emissions, Contaminants or other items.

SEND COMPLETED APPLICATION AND ALL ATTACHMENTS TO:

North Dakota Department of Environmental Quality
Division of Air Quality
918 E Divide Avenue, 2nd Floor
Bismarck, ND 58501-1947
(701)328-5188

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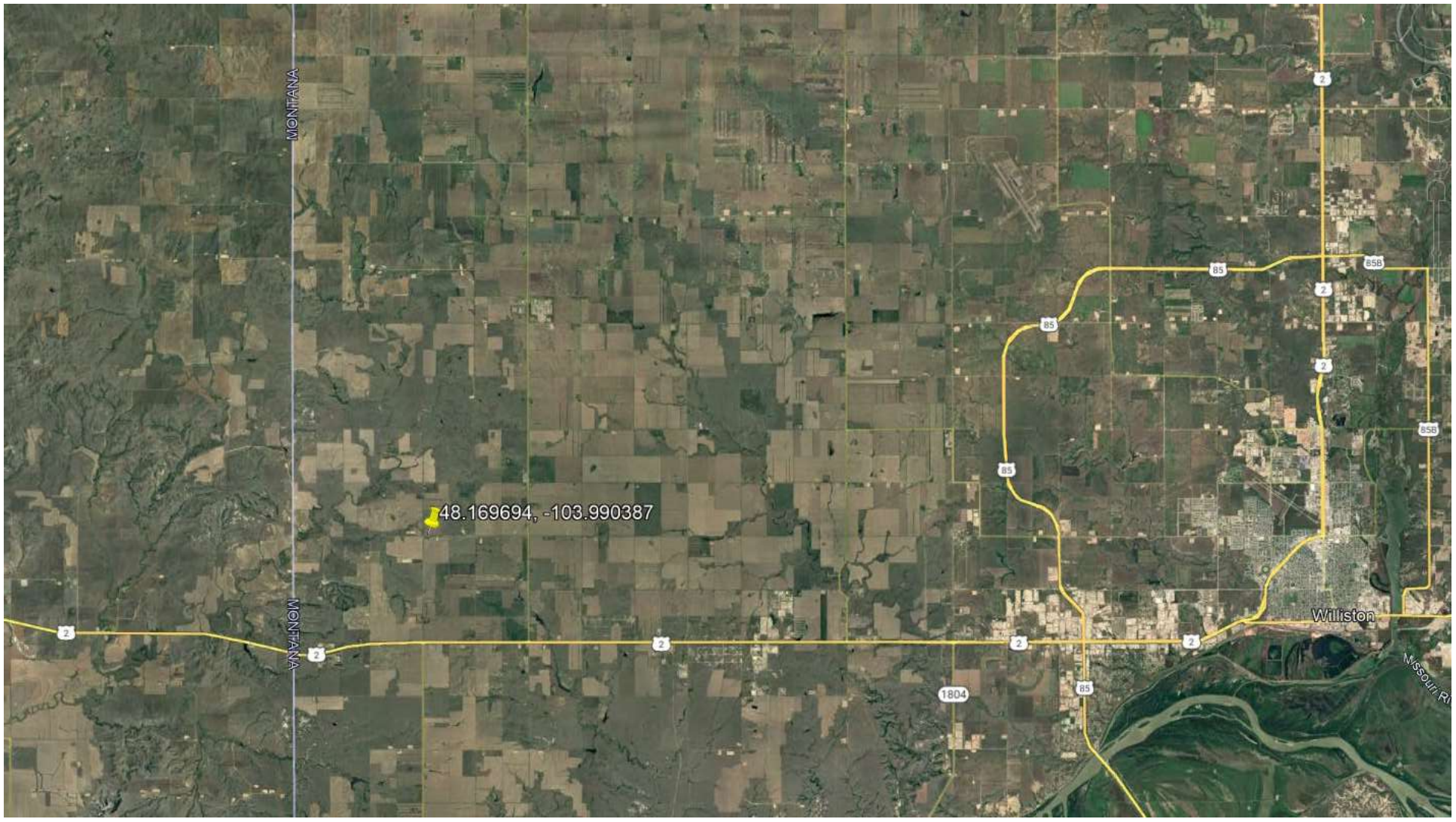

Figure Title: **Area Map**

ONEOK
ROCKIES MIDSTREAM
A SUBSIDIARY OF ONEOK PARTNERS

Figure 1.

ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Williams County, ND

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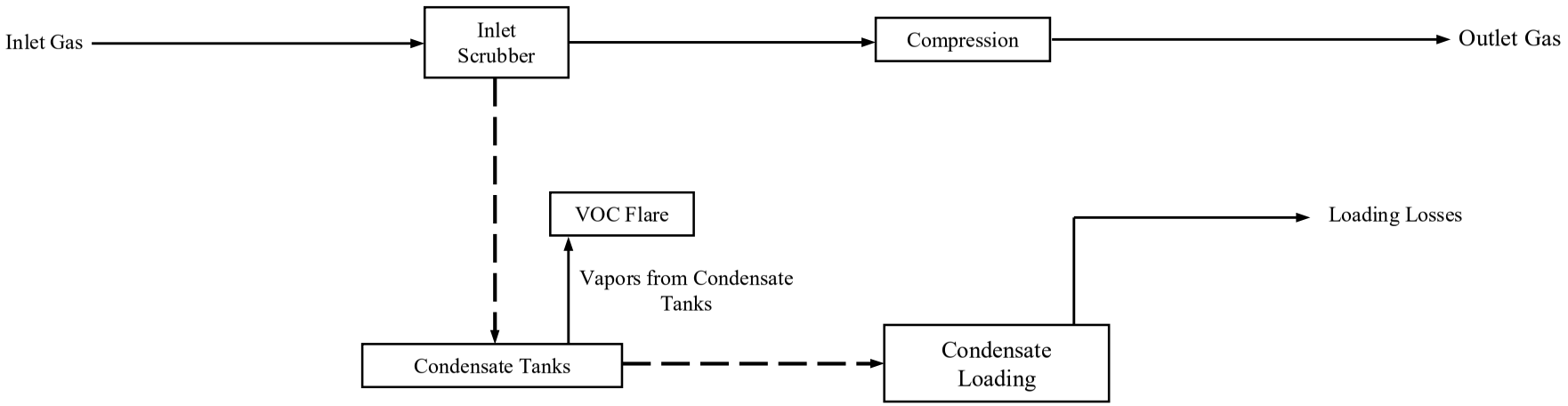

Gas/Vapor

Condensate/Water

ORM Boulder Compressor Station

Figure 2: Process Flow Diagram

McKenzie County, North Dakota

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Facility Emissions Summary - Annual

Unit ID	Description	NOx	CO	VOC	SO_2	PM	HCHO	HAP	CO_2e
		TPY	TPY	TPY	TPY	TPY	TPY	TPY	TPY
C-1	2,500-hp Caterpillar G3608 Engine	24.14	27.22	16.92	0.05	0.79	1.93	2.39	11,452.17
C-2	2,500-hp Caterpillar G3608 Engine	24.14	27.22	16.92	0.05	0.79	1.93	2.39	11,452.17
C-3	2,500-hp Caterpillar G3608 Engine	24.14	27.22	16.92	0.05	0.79	1.93	2.39	11,452.17
FL-1	Process/VOC Flare	1.06	2.56	0.31	<0.01	0.05	<0.01	0.01	1,524.66
TK-1	400-bbl Condensate Tank	--	--	5.99	--	--	--	0.32	13.39
TK-2	400-bbl Condensate Tank	--	--	0.83	--	--	--	0.04	0.00
TK-3	400-bbl Condensate Tank	--	--	0.83	--	--	--	0.04	0.00
WTK-1	400-bbl Produced Water Tank	--	--	0.04	--	--	--	<0.01	0.10
TL-1	Condensate Truck Loading	--	--	11.75	--	--	--	0.62	0.02
MTK-1	400-bbl Methanol Tank	--	--	0.17	--	--	--	0.17	--
FUG	Fugitive Emissions	--	--	11.71	--	--	--	1.18	185.26
BD	Miscellaneous Venting and Blowdowns to Atmosphere	--	--	5.80	--	--	--	0.11	144.66
	Total =	**73.48**	**84.21**	**88.18**	**0.14**	**2.41**	**5.79**	**9.67**	**36,224.61**

Notes:
1) Tank emissions are routed to the Process/VOC Flare which is a single stack. Unburned VOC and HAP reported at the tanks.
2) ORM requests a federally enforceable limits of 5.99 tons per year per each condensate tank and produced water tank.
1) Miscellaneous venting and blowdowns to atmosphere include, but are not limited to, miscellaneous planned and unplanned venting to atmosphere from pressure relief valves, startup, shut-down, maintenance, compressor blowdowns, pigging actions, and/or pneumatic controllers.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Facility Emissions Summary - Hourly

Unit ID	Description	NOx	CO	VOC	SO_2	PM	HCHO	HAP	CO_2e
		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
C-1	2,500-hp Caterpillar G3608 Engine	5.51	6.21	3.86	0.01	0.18	0.44	0.55	2,614.65
C-2	2,500-hp Caterpillar G3608 Engine	5.51	6.21	3.86	0.01	0.18	0.44	0.55	2,614.65
C-3	2,500-hp Caterpillar G3608 Engine	5.51	6.21	3.86	0.01	0.18	0.44	0.55	2,614.65
FL-1	Process/VOC Flare	0.40	1.32	0.94	<0.01	0.01	<0.01	0.02	649.67
TK-1	400-bbl Condensate Tank	--	--	1.37	--	--	--	0.07	3.06
TK-2	400-bbl Condensate Tank	--	--	0.19	--	--	--	0.01	0.00
TK-3	400-bbl Condensate Tank	--	--	0.19	--	--	--	0.01	0.00
WTK-1	400-bbl Produced Water Tank	--	--	0.01	--	--	--	<0.01	0.02
TL-1	Condensate Truck Loading	--	--	2.68	--	--	--	0.14	0.01
MTK-1	400-bbl Methanol Tank	--	--	0.04	--	--	--	0.04	--
FUG	Fugitive Emissions	--	--	2.67	--	--	--	0.27	42.30
BD	Miscellaneous Venting and Blowdowns to Atmosphere	--	--	--	--	--	--	--	--
	Total =	**16.94**	**19.96**	**19.68**	**0.03**	**0.55**	**1.32**	**2.20**	**8,539.00**

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Facility Analyses

Component	Molecular Weight	Stream 1 Inlet Gas				Stream 2 Condensate				Stream 3 Flash Gas			
		Mole %	Equiv. Wt. Basis	Weight %	HC Weight %	Mole %	Equiv. Wt. Basis	Weight %	HC Weight %	Mole %	Equiv. Wt. Basis	Weight %	HC Weight %
Hydrogen Sulfide	34.081	0.0000%	0.00	0.00%	-	0.0000%	0.00	0.00%	-	0.0000%	0.00	0.00%	-
Carbon Dioxide	44.010	0.7680%	0.34	1.31%	-	0.0087%	0.00	0.00%	-	0.5400%	0.24	0.57%	-
Nitrogen	28.013	2.4711%	0.69	2.67%	-	0.0005%	0.00	0.00%	-	0.3350%	0.09	0.22%	-
Helium	4.003	0.0000%	0.00	0.00%	-	0.0000%	0.00	0.00%	-	0.0000%	0.00	0.00%	-
Oxygen	31.999	0.0000%	0.00	0.00%	-	0.0000%	0.00	0.00%	-	0.0000%	0.00	0.00%	-
Methane	16.043	58.3969%	9.37	36.18%	37.67%	0.0858%	0.01	0.02%	0.02%	16.1000%	2.58	6.16%	6.21%
Ethane	30.069	20.2914%	6.10	23.56%	24.54%	1.0600%	0.32	0.36%	0.36%	27.3000%	8.21	19.58%	19.74%
Propane	44.096	10.7128%	4.72	18.24%	19.00%	3.9900%	1.76	1.98%	1.98%	27.5000%	12.13	28.93%	29.16%
i-Butane	58.122	1.1679%	0.68	2.62%	2.73%	1.4700%	0.85	0.96%	0.96%	3.6100%	2.10	5.01%	5.05%
n-Butane	58.122	3.6719%	2.13	8.24%	8.58%	7.9600%	4.63	5.19%	5.19%	12.8000%	7.44	17.75%	17.89%
i-Pentane	72.149	0.6731%	0.49	1.88%	1.95%	5.0900%	3.67	4.12%	4.12%	3.1400%	2.27	5.40%	5.45%
n-Pentane	72.149	1.0288%	0.74	2.87%	2.99%	11.6000%	8.37	9.40%	9.40%	5.1400%	3.71	8.85%	8.92%
n-Hexane	86.175	0.1565%	0.13	0.52%	0.54%	21.0000%	18.10	20.32%	20.32%	2.4000%	2.07	4.93%	4.97%
Other Hexanes	86.175	0.4351%	0.37	1.45%	1.51%	0.0000%	0.00	0.00%	0.00%	0.0000%	0.00	0.00%	0.00%
Heptanes	100.202	0.0820%	0.08	0.32%	0.33%	23.9000%	23.95	26.88%	26.89%	0.7820%	0.78	1.87%	1.88%
Benzene	78.114	0.0168%	0.01	0.05%	0.05%	0.9670%	0.76	0.85%	0.85%	0.1140%	0.09	0.21%	0.21%
Toluene	92.141	0.0130%	0.01	0.05%	0.05%	1.5200%	1.40	1.57%	1.57%	0.0460%	0.04	0.10%	0.10%
Ethylbenzene	106.167	0.0009%	0.00	0.00%	0.00%	0.2740%	0.29	0.33%	0.33%	0.0024%	0.00	0.01%	0.01%
Xylenes	106.167	0.0038%	0.00	0.02%	0.02%	0.8820%	0.94	1.05%	1.05%	0.0059%	0.01	0.01%	0.02%
Octanes	114.229	0.0000%	0.00	0.00%	0.00%	14.6000%	16.68	18.72%	18.72%	0.1330%	0.15	0.36%	0.37%
2,2,4-Trimethylpentane	114.231	0.0084%	0.01	0.04%	0.04%	0.0000%	0.00	0.00%	0.00%	0.0000%	0.00	0.00%	0.00%
Nonanes	128.255	0.0000%	0.00	0.00%	0.00%	4.2800%	5.49	6.16%	6.16%	0.0109%	0.01	0.03%	0.03%
Decanes	142.282	0.0000%	0.00	0.00%	0.00%	1.3120%	1.87	2.10%	2.10%	0.0010%	0.00	0.00%	0.00%
Totals =		99.8984%	25.90	100.00%	100.00%	100.0000%	89.08	100.00%	100.00%	99.9602%	41.92	100.00%	100.00%
		Total HC =	**24.87**	**Total VOC =**	**37.79%**	**Total HC =**	**89.08**	**Total VOC =**	**99.63%**	**Total HC =**	**41.59**	**Total VOC =**	**74.05%**
				Total HAP =	**0.70%**			**Total HAP =**	**24.11%**			**Total HAP =**	**5.31%**

Notes:

1) Representative inlet gas analysis with C6+ estimated per GLYCalc. Condensate and flash gas compositions calculated with ProMax process simulation using representative analysis. (Elm Tree CS, located 6 miles away)

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Estimated Extended Gas Analysis

Component	Production	
	GRI Fraction	Estimated Mole %
Other Hexanes	0.5319	0.4351
n-Hexane	0.1913	0.1565
Heptane	0.1002	0.0820
2,2,4-Trimethylpentane	0.0103	0.0084
Octanes+	0.1241	0.1015
Benzene	0.0205	0.0168
Toluene	0.0159	0.0130
Ethylbenzene	0.0011	0.0009
Xylenes	0.0046	0.0038
Total=		0.8180

C6+ Value From Gas Analysis = 0.8181 mole %

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Engine Information and Manufacturer Emission Factors

Equipment Information			
	C-1	**C-2**	**C-3**
Make	Caterpillar	Caterpillar	Caterpillar
Model	G3608 ADEM4	G3608 ADEM4	G3608 ADEM4
Design Rating (hp)	2,500	2,500	2,500
Fuel Consumption (Btu/hp-hr)	7,205	7,205	7,205
Fuel Consumption (scfh)	17,659	17,659	17,659
Fuel Consumption (mmBtu/hr)	18.01	18.01	18.01
Fuel Consumption (scf/yr)	154,695,588	154,695,588	154,695,588
Fuel Heating Value (Btu/scf)	1,020	1,020	1,020
Design Class	4S-LB	4S-LB	4S-LB
Controls	NSCR	NSCR	NSCR
Operating Hours	8,760	8,760	8,760
Stack Height (ft)	30.0	30.0	30.0
Stack Diameter (ft)	4.5	4.5	4.5
Exhaust Temperature (°F)	784	784	784
Exhaust Flow (acfm)	16,205	16,205	16,205
Exhaust Flow (scfh)	412,680	412,680	412,680
Exit Velocity (ft/s)	16.98	16.98	16.98

Uncontrolled Emission Factors			
	C-1	**C-2**	**C-3**
NOx (g/hp-hr)	1.00	1.00	1.00
CO (g/hp-hr)	4.51	4.51	4.51
VOC (g/hp-hr)	1.46	1.46	1.46
Formaldehyde (g/hp-hr)	0.17	0.17	0.17
CO_2 (g/hp-hr)	474.00	474.00	474.00

Control Efficiency			
	C-1	**C-2**	**C-3**
NOx	0.00%	0.00%	0.00%
CO	75.00%	75.00%	75.00%
VOC	52.00%	52.00%	52.00%
Formaldehyde	50.00%	50.00%	50.00%

Post-Control Emission Factors			
	C-1	**C-2**	**C-3**
NOx (g/hp-hr)	1.00	1.00	1.00
CO (g/hp-hr)	1.13	1.13	1.13
VOC (g/hp-hr)	0.70	0.70	0.70
Formaldehyde (g/hp-hr)	0.08	0.08	0.08
CO_2 (g/hp-hr)	474.00	474.00	474.00

Notes:
1) Nox emission factors based on JJJJ limitations. CO, VOC, and formaldehyde emission factors based on manufacturer specifications.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Engine AP-42/EPA Emission Factors

Emission Factors	
	4S-LB
SO_2 (lb/mmBtu)	5.88E-04
$PM_{10/2.5}$ (lb/mmBtu)	7.71E-05
PM_{COND} (lb/mmBtu)	9.91E-03
PM_{TOT} (lb/mmBtu)	9.99E-03
Acetaldehyde (lb/mmBtu)	8.36E-03
Acrolein (lb/mmBtu)	5.14E-03
Benzene (lb/mmBtu)	4.40E-04
Ethylbenzene (lb/mmBtu)	3.97E-05
Methanol (lb/mmBtu)	2.50E-03
Toluene (lb/mmBtu)	4.08E-04
Xylenes (lb/mmBtu)	1.84E-04
Other HAP (lb/mmBtu)	2.32E-03
Carbon Dioxide (CO_2) (kg/mmBtu)	5.31E+01
Methane (CH_4) (kg/mmBtu)	1.00E-03
Nitrous Oxide (N_2O) (kg/mmBtu)	1.00E-04

Control Efficiency	
	4S-LB
HAP	70.00%

Post-Control Emission Factors	
	4S-LB
Acetaldehyde (lb/mmBtu)	2.51E-03
Acrolein (lb/mmBtu)	1.54E-03
Benzene (lb/mmBtu)	1.32E-04
Ethylbenzene (lb/mmBtu)	1.19E-05
Methanol (lb/mmBtu)	7.50E-04
Toluene (lb/mmBtu)	1.22E-04
Xylenes (lb/mmBtu)	5.52E-05
Other HAP (lb/mmBtu)	6.97E-04

Notes:

1) Criteria pollutant and hazardous air pollutant emission factors are from AP-42 Table 3.2-2 (7/00). Greenhouse gas emission factors are from 40 CFR Tables C-1 and C-2.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Engine Emissions Calculations

Unit ID: **C-1**

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours		Conversion			Annual Emissions	
NOx	1.00E+00	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**5.51**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**24.14**	**TPY**
CO	1.13E+00	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**6.21**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**27.22**	**TPY**
VOC	7.01E-01	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**3.86**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**16.92**	**TPY**
SO_2	5.88E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.05**	**TPY**
$PM_{10/2.5}$	7.71E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
PM_{COND}	9.91E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.18**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.78**	**TPY**
PM_{TOT}	9.99E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.18**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.79**	**TPY**
Acetaldehyde	2.51E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.05**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.20**	**TPY**
Acrolein	1.54E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.03**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.12**	**TPY**
Benzene	1.32E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
Ethylbenzene	1.19E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**<0.01**	**TPY**
Formaldehyde	8.00E-02	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**0.44**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**1.93**	**TPY**
Methanol	7.50E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.06**	**TPY**
Toluene	1.22E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
Xylenes	5.52E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**<0.01**	**TPY**
Other HAP	6.97E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.05**	**TPY**
CO_2	4.74E+02	g/hp-hr	X	2,500.00	hp	X	0.00220462	lb/gr	=	**2,612.47**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**11,442.64**	**TPY**
CH_4	1.00E-03	kg/mmBtu	X	18.01	mmBtu/hr	X	2.20462	lb/kg	=	**0.04**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.17**	**TPY**
N_2O	1.00E-04	kg/mmBtu	X	18.01	mmBtu/hr	X	2.20462	lb/kg	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.02**	**TPY**

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Engine Emissions Calculations

Unit ID: **C-2**

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours		Conversion			Annual Emissions	
NOx	1.00E+00	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**5.51**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**24.14**	**TPY**
CO	1.13E+00	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**6.21**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**27.22**	**TPY**
VOC	7.01E-01	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**3.86**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**16.92**	**TPY**
SO_2	5.88E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.05**	**TPY**
$PM_{10/2.5}$	7.71E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
PM_{COND}	9.91E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.18**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.78**	**TPY**
PM_{TOT}	9.99E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.18**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.79**	**TPY**
Acetaldehyde	2.51E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.05**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.20**	**TPY**
Acrolein	1.54E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.03**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.12**	**TPY**
Benzene	1.32E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
Ethylbenzene	1.19E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**<0.01**	**TPY**
Formaldehyde	8.00E-02	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**0.44**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**1.93**	**TPY**
Methanol	7.50E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.06**	**TPY**
Toluene	1.22E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
Xylenes	5.52E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**<0.01**	**TPY**
Other HAP	6.97E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.05**	**TPY**
CO_2	4.74E+02	g/hp-hr	X	2,500.00	hp	X	0.00220462	lb/gr	=	**2,612.47**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**11,442.64**	**TPY**
CH_4	1.00E-03	kg/mmBtu	X	18.01	mmBtu/hr	X	2.20462	lb/kg	=	**0.04**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.17**	**TPY**
N_2O	1.00E-04	kg/mmBtu	X	18.01	mmBtu/hr	X	2.20462	lb/kg	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.02**	**TPY**

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Engine Emissions Calculations

Unit ID: **C-3**

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours		Conversion			Annual Emissions	
NOx	1.00E+00	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**5.51**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**24.14**	**TPY**
CO	1.13E+00	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**6.21**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**27.22**	**TPY**
VOC	7.01E-01	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**3.86**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**16.92**	**TPY**
SO_2	5.88E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.05**	**TPY**
$PM_{10/2.5}$	7.71E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
PM_{COND}	9.91E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.18**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.78**	**TPY**
PM_{TOT}	9.99E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.18**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.79**	**TPY**
Acetaldehyde	2.51E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.05**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.20**	**TPY**
Acrolein	1.54E-03	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.03**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.12**	**TPY**
Benzene	1.32E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
Ethylbenzene	1.19E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**<0.01**	**TPY**
Formaldehyde	8.00E-02	g/hp-hr	X	2,500	hp	X	0.00220462	lb/gr	=	**0.44**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**1.93**	**TPY**
Methanol	7.50E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.06**	**TPY**
Toluene	1.22E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.01**	**TPY**
Xylenes	5.52E-05	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**<0.01**	**TPY**
Other HAP	6.97E-04	lb/mmBtu	X	18.01	mmBtu/hr	X	-	-	=	**0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.05**	**TPY**
CO_2	4.74E+02	g/hp-hr	X	2,500.00	hp	X	0.00220462	lb/gr	=	**2,612.47**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**11,442.64**	**TPY**
CH_4	1.00E-03	kg/mmBtu	X	18.01	mmBtu/hr	X	2.20462	lb/kg	=	**0.04**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.17**	**TPY**
N_2O	1.00E-04	kg/mmBtu	X	18.01	mmBtu/hr	X	2.20462	lb/kg	=	**<0.01**	**lb/hr**	X	8,760	X	0.0005	ton/lb	=	**0.02**	**TPY**

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Flare Information and Emission Factors

Equipment Information	
	FL-1A
Description	Process Flare
VOC to Flare (lb/hr)	46.86
Stream Heat Content (Btu/scf)	1,350
Stream Net Btu Value (Btu/hr)	2,550,891
Operating Hours	600
Control Efficiency	98%
Pilot Stream Heat Content (Btu/scf)	1,026
Pilot Gas Flow Rate (scfh)	1,200.00
Pilot Gas Capacity (mmBtu/hr)	1.231
Pilot Operating Hours	8,760

AP-42/EPA Emission Factors			
	Flare Stream		**Pilot Gas**
NOx (lb/mmBtu)	0.068	**NOx (lb/mmscf)**	100.0
CO (lb/mmBtu)	0.31	**CO (lb/mmscf)**	84.0
VOC	Mass Balance	**VOC (lb/mmscf)**	5.5
SO_2	Stoichiometric	**SO_2 (lb/mmscf)**	0.6
$PM_{10/2.5}$	--	**$PM_{10/2.5}$ (lb/mmscf)**	1.9
PM_{COND}	--	**PM_{COND} (lb/mmscf)**	5.7
PM_{TOT}	--	**PM_{TOT} (lb/mmscf)**	7.6
Formaldehyde	--	**Formaldehyde (lb/mmscf)**	7.50E-02
n-Hexane	Mass Balance	**n-Hexane (lb/mmscf)**	1.80E+00
Benzene	Mass Balance	**Benzene (lb/mmscf)**	2.10E-03
Toluene	Mass Balance	**Toluene (lb/mmscf)**	3.40E-03
Ethylbenzene	Mass Balance	**Ethylbenzene**	--
Xylenes	Mass Balance	**Xylenes**	--
Other HAP	Mass Balance	**Other HAP (lb/mmscf)**	1.90E-03
Carbon Dioxide (CO_2) (kg/mmBtu)	53.06/Mass Balance	**Carbon Dioxide (CO_2) (kg/mmBtu)**	53.06
Methane (CH_4) (kg/mmBtu)	0.001/Mass Balance	**Methane (CH_4) (kg/mmBtu)**	1.00E-03
Nitrous Oxide (N_2O) (kg/mmBtu)	1.00E-04	**Nitrous Oxide (N_2O) (kg/mmBtu)**	1.00E-04

Notes:
1) NOx and CO emission factors (lb/mmBtu), flare stream: AP-42, Table 13.5-1 and 13.5-2 (2/2018). Pilot criteria and HAP emission factors (lb/mmscf): AP-42, Table 1.4-1, -2 (7/98). GHG emission factors (kg/mmBtu): 40 CFR 98.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Flare Emissions Calculations

Unit ID: **FL-1A**

Total: Stream + Pilot

Pollutant	Hourly Emissions		Annual Emissions	
NOx	0.29	lb/hr	0.58	TPY
CO	0.89	lb/hr	0.68	TPY
VOC	0.94	lb/hr	0.31	TPY
SO_2	<0.01	lb/hr	<0.01	TPY
$PM_{10/2.5}$	<0.01	lb/hr	0.01	TPY
PM_{COND}	0.01	lb/hr	0.03	TPY
PM_{TOT}	0.01	lb/hr	0.04	TPY
Formaldehyde	<0.01	lb/hr	<0.01	TPY
n-Hexane	0.02	lb/hr	0.01	TPY
Benzene	<0.01	lb/hr	<0.01	TPY
Toluene	<0.01	lb/hr	<0.01	TPY
Ethylbenzene	<0.01	lb/hr	<0.01	TPY
Xylenes	<0.01	lb/hr	<0.01	TPY
Other HAP	<0.01	lb/hr	<0.01	TPY
CO_2	444.10	lb/hr	720.84	TPY
CH_4	0.94	lb/hr	0.29	TPY
N_2O	<0.01	lb/hr	<0.01	TPY

Stream Emissions

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours		Conversion			Annual Emissions	
NOx	6.80E-02	lb/mmBtu	X	2.55E+00	mmBtu/hr	X	-	-	=	0.17	lb/hr	X	600	X	0.0005	ton/lb	=	0.05	TPY
CO	3.10E-01	lb/mmBtu	X	2.55E+00	mmBtu/hr	X	-	-	=	0.79	lb/hr	X	600	X	0.0005	ton/lb	=	0.24	TPY
VOC	-	-	-	-	-	-	-	-	=	0.94	lb/hr	X	600	X	0.0005	ton/lb	=	0.28	TPY
SO_2	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	600	X	0.0005	ton/lb	=	0.00	TPY
n-Hexane	-	-	-	-	-	-	-	-	=	0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
Benzene	-	-	-	-	-	-	-	-	=	<0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
Toluene	-	-	-	-	-	-	-	-	=	<0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
Ethylbenzene	-	-	-	-	-	-	-	-	=	<0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
Xylenes	-	-	-	-	-	-	-	-	=	<0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
Other HAP	-	-	-	-	-	-	-	-	=	<0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
CO_2	5.31E+01	kg/mmBtu	X	2.55E+00	mmBtu/hr	X	2.20462	lb/kg	=	298.40	lb/hr	X	600	X	0.0005	ton/lb	=	89.52	TPY
CO_2	-	-	-	-	-	-	-	-	=	1.69	lb/hr	X	600	X	0.0005	ton/lb	=	0.51	TPY
CH_4	1.00E-03	kg/mmBtu	X	2.55E+00	mmBtu/hr	X	2.20462	lb/kg	=	0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY
CH_4	-	-	-	-	-	-	-	-	=	0.93	lb/hr	X	600	X	0.0005	ton/lb	=	0.28	TPY
N_2O	1.00E-04	kg/mmBtu	X	2.55E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	600	X	0.0005	ton/lb	=	<0.01	TPY

Pilot Emissions

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours		Conversion			Annual Emissions	
NOx	1.00E+02	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	0.12	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.53	TPY
CO	8.40E+01	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	0.10	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.44	TPY
VOC	5.50E+00	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.03	TPY
SO_2	6.00E-01	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
$PM_{10/2.5}$	1.90E+00	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.01	TPY
PM_{COND}	5.70E+00	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.03	TPY
PM_{TOT}	7.60E+00	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.04	TPY
Formaldehyde	7.50E-02	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
n-Hexane	1.80E+00	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.01	TPY
Benzene	2.10E-03	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Toluene	3.40E-03	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Other HAP	1.90E-03	lb/mmscf	X	1.20E-03	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
CO_2	5.31E+01	kg/mmBtu	X	1.23E+00	mmBtu/hr	X	2.20462	lb/kg	=	144.02	lb/hr	X	8,760	X	0.0005	ton/lb	=	630.82	TPY
CH_4	1.00E-03	kg/mmBtu	X	1.23E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.01	TPY
N_2O	1.00E-04	kg/mmBtu	X	1.23E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Flare Emissions Calculations - Flare Stream Analysis

Unit ID: **FL-1A**

Component	Molecular Weight	Stream 1 Miscellaneous Vents and Blowdowns		Total Streams Burned in Flare					Net Heating Value	Net Btu Rate
		1.89E+03	scfh	Uncontrolled		scfd	Controlled			
		Mole %	lb/hr	lb/hr	TPY		lb/hr	TPY	Btu/scf	Btu/hr
Water	18.0153	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Hydrogen Sulfide	34.081	0.000%	0.00	0.00	0.00	0	0.00	0.00	586.80	0
Carbon Dioxide	44.010	0.768%	1.69	1.69	0.51	349	1.69	0.51	0.00	0
Nitrogen	28.013	2.471%	3.45	3.45	1.04	1,122	3.45	1.04	0.00	0
Helium	4.003	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Oxygen	31.999	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Methane	16.043	58.397%	46.72	46.72	14.02	26,517	0.93	0.28	909.40	1,004,768
Ethane	30.069	20.291%	30.43	30.43	9.13	9,214	0.61	0.18	1,618.70	621,440
Propane	44.096	10.713%	23.56	23.56	7.07	4,864	0.47	0.14	2,314.90	469,198
i-Butane	58.122	1.168%	3.39	3.39	1.02	530	0.07	0.02	3,000.40	66,299
n-Butane	58.122	3.672%	10.64	10.64	3.19	1,667	0.21	0.06	3,010.80	209,167
i-Pentane	72.149	0.673%	2.42	2.42	0.73	306	0.05	0.01	3,699.00	47,107
n-Pentane	72.149	1.029%	3.70	3.70	1.11	467	0.07	0.02	3,706.90	72,154
n-Hexane	86.175	0.157%	0.67	0.67	0.20	71	0.01	0.00	4,403.80	13,040
Other Hexanes	86.175	0.435%	1.87	1.87	0.56	198	0.04	0.01	4,403.80	36,252
Heptanes	100.202	0.082%	0.41	0.41	0.12	37	0.01	0.00	5,100.00	7,912
Benzene	78.114	0.017%	0.07	0.07	0.02	8	0.00	0.00	3,590.90	1,141
Toluene	92.141	0.013%	0.06	0.06	0.02	6	0.00	0.00	4,273.60	1,051
Ethylbenzene	106.167	0.001%	0.00	0.00	0.00	0	0.00	0.00	4,970.50	85
Xylenes	106.167	0.004%	0.02	0.02	0.01	2	0.00	0.00	4,957.10	356
Octanes	114.229	0.000%	0.00	0.00	0.00	0	0.00	0.00	5,796.00	0
2,2,4-Trimethylpentane	114.231	0.008%	0.05	0.05	0.01	4	0.00	0.00	5,778.80	918
Nonanes	128.255	0.000%	0.00	0.00	0.00	0	0.00	0.00	6,493.20	0
Decanes	142.282	0.000%	0.00	0.00	0.00	0	0.00	0.00	7,189.60	0
Totals =		**99.8984%**	**129.14**	**129.14**	**38.74**	**45,362**	**--**	**--**	**--**	**2,550,891**
Total VOC =		**17.971%**	**46.86**	**46.86**	**14.06**	**--**	**0.94**	**0.28**	**Heat Value (Btu/scf)**	**1,350**
Total HAP =				**0.87**	**0.26**	**--**	**0.02**	**0.01**		
Total H_2S=				**0.00**	**0.00**	**--**	**0.00**	**0.00**		
MW of Stream =						**25.92**				

Notes:
1) Representative inlet gas analysis with C6+ estimated per GLYCalc. Estimated 600 vents or blowdowns at 1.889 MCF and one hour each.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Flare Information and Emission Factors

Equipment Information	
	FL-1B
Description	VOC Flare
VOC to Flare (lb/hr)	49.43
Stream Heat Content (Btu/scf)	2,187
Stream Net Btu Value (Btu/hr)	1,331,169
Operating Hours	8,760
Control Efficiency	98%
Pilot Stream Heat Content (Btu/scf)	1,026
Pilot Gas Flow Rate (scfh)	194.93
Pilot Gas Capacity (mmBtu/hr)	0.2
Pilot Operating Hours	8,760

AP-42/EPA Emission Factors[1]			
	Flare Stream		**Pilot Gas**
NOx (lb/mmBtu)	0.068	**NOx (lb/mmscf)**	100.0
CO (lb/mmBtu)	0.31	**CO (lb/mmscf)**	84.0
VOC	Mass Balance	**VOC (lb/mmscf)**	5.5
SO_2	Stoichiometric	**SO_2 (lb/mmscf)**	0.6
$PM_{10/2.5}$	--	**$PM_{10/2.5}$ (lb/mmscf)**	1.9
PM_{COND}	--	**PM_{COND} (lb/mmscf)**	5.7
PM_{TOT}	--	**PM_{TOT} (lb/mmscf)**	7.6
Formaldehyde	--	**Formaldehyde (lb/mmscf)**	7.50E-02
n-Hexane	Mass Balance	**n-Hexane (lb/mmscf)**	1.80E+00
Benzene	Mass Balance	**Benzene (lb/mmscf)**	2.10E-03
Toluene	Mass Balance	**Toluene (lb/mmscf)**	3.40E-03
Ethylbenzene	Mass Balance	**Ethylbenzene**	--
Xylenes	Mass Balance	**Xylenes**	--
Other HAP	Mass Balance	**Other HAP (lb/mmscf)**	1.90E-03
Carbon Dioxide (CO_2) (kg/mmBtu)	53.06/Mass Balance	**Carbon Dioxide (CO_2) (kg/mmBtu)**	53.06
Methane (CH_4) (kg/mmBtu)	0.001/Mass Balance	**Methane (CH_4) (kg/mmBtu)**	1.00E-03
Nitrous Oxide (N_2O) (kg/mmBtu)	1.00E-04	**Nitrous Oxide (N_2O) (kg/mmBtu)**	1.00E-04

Notes:
1) NOx and CO emission factors (lb/mmBtu), flare stream: AP-42, Table 13.5-1 (2/2018). Pilot criteria and HAP emission factors (lb/mmscf): AP-42, Table 1.4-1, -2 (7/98). GHG emission factors (kg/mmBtu): 40 CFR 98.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Flare Emissions Calculations

Unit ID: **FL-1B**

Total: Stream + Pilot

Pollutant	Hourly Emissions		Annual Emissions	
NOx	0.11	lb/hr	0.48	TPY
CO	0.43	lb/hr	1.88	TPY
VOC	<0.01	lb/hr	<0.01	TPY
SO_2	<0.01	lb/hr	<0.01	TPY
$PM_{10/2.5}$	<0.01	lb/hr	<0.01	TPY
PM_{COND}	<0.01	lb/hr	<0.01	TPY
PM_{TOT}	<0.01	lb/hr	0.01	TPY
Formaldehyde	<0.01	lb/hr	<0.01	TPY
n-Hexane	<0.01	lb/hr	<0.01	TPY
Benzene	<0.01	lb/hr	<0.01	TPY
Toluene	<0.01	lb/hr	<0.01	TPY
Other HAP	<0.01	lb/hr	<0.01	TPY
CO_2	179.49	lb/hr	786.18	TPY
CH_4	0.09	lb/hr	0.38	TPY
N_2O	<0.01	lb/hr	<0.01	TPY

Stream Emissions

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours			Conversion			Annual Emissions	
NOx	6.80E-02	lb/mmBtu	X	1.33E+00	mmBtu/hr	X	-	-	=	0.09	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.40	TPY
CO	3.10E-01	lb/mmBtu	X	1.33E+00	mmBtu/hr	X	-	-	=	0.41	lb/hr	X	8,760	X	0.0005	ton/lb	=	1.81	TPY
SO_2	-	-	-	-	-	-	-	-	=	0.00	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.00	TPY
CO_2	5.31E+01	kg/mmBtu	X	1.33E+00	mmBtu/hr	X	2.20462	lb/kg	=	155.72	lb/hr	X	8,760	X	0.0005	ton/lb	=	682.04	TPY
CO_2	-	-	-	-	-	-	-	-	=	0.38	lb/hr	X	8,760	X	0.0005	ton/lb	=	1.67	TPY
CH_4	1.00E-03	kg/mmBtu	X	1.33E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.01	TPY
CH_4	-	-	-	-	-	-	-	-	=	0.08	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.36	TPY
N_2O	1.00E-04	kg/mmBtu	X	1.33E+00	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY

Pilot Emissions

Pollutant	Emission Factor			Capacity			Conversion			Hourly Emissions			Operating Hours			Conversion			Annual Emissions	
NOx	1.00E+02	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	0.02	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.09	TPY
CO	8.40E+01	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	0.02	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.07	TPY
VOC	5.50E+00	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
SO_2	6.00E-01	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
$PM_{10/2.5}$	1.90E+00	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
PM_{COND}	5.70E+00	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
PM_{TOT}	7.60E+00	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.01	TPY
Formaldehyde	7.50E-02	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
n-Hexane	1.80E+00	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Benzene	2.10E-03	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Toluene	3.40E-03	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
Other HAP	1.90E-03	lb/mmscf	X	1.95E-04	mmscf/hr	X	-	-	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
CO_2	5.31E+01	kg/mmBtu	X	2.00E-01	mmBtu/hr	X	2.20462	lb/kg	=	23.40	lb/hr	X	8,760	X	0.0005	ton/lb	=	102.47	TPY
CH_4	1.00E-03	kg/mmBtu	X	2.00E-01	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY
N_2O	1.00E-04	kg/mmBtu	X	2.00E-01	mmBtu/hr	X	2.20462	lb/kg	=	<0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	<0.01	TPY

1) Tank emissions are routed to the VOC flare. Unburned VOC and HAP reported at the tanks. Pilot VOC and HAP reported at the VOC flare.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Flare Emissions Calculations - Stream Analysis

Unit ID: **FL-1B**

Component	Molecular Weight	Stream 1 Tank Emissions		Total Streams Burned in Flare					Net Heating Value	Net Btu Rate
		6.09E+02	scfh	Uncontrolled		scfd	Controlled			
		Mole %	lb/hr	lb/hr	TPY		lb/hr	TPY	Btu/scf	Btu/hr
Water	18.0153	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Hydrogen Sulfide	34.081	0.000%	0.00	0.00	0.00	0	0.00	0.00	586.80	0
Carbon Dioxide	44.010	0.540%	0.38	0.38	1.67	79	0.38	1.67	0.00	0
Nitrogen	28.013	0.335%	0.15	0.15	0.66	49	0.15	0.66	0.00	0
Helium	4.003	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Oxygen	31.999	0.000%	0.00	0.00	0.00	0	0.00	0.00	0.00	0
Methane	16.043	16.100%	4.15	4.15	18.16	2,353	0.08	0.36	909.40	89,166
Ethane	30.069	27.300%	13.18	13.18	57.71	3,990	0.26	1.15	1,618.70	269,120
Propane	44.096	27.500%	19.46	19.46	85.26	4,019	0.39	1.71	2,314.90	387,688
i-Butane	58.122	3.610%	3.37	3.37	14.75	528	0.07	0.30	3,000.40	65,963
n-Butane	58.122	12.800%	11.94	11.94	52.31	1,871	0.24	1.05	3,010.80	234,698
i-Pentane	72.149	3.140%	3.64	3.64	15.93	459	0.07	0.32	3,699.00	70,734
n-Pentane	72.149	5.140%	5.95	5.95	26.07	751	0.12	0.52	3,706.90	116,036
n-Hexane	86.175	2.400%	3.32	3.32	14.54	351	0.07	0.29	4,403.80	64,366
Other Hexanes	86.175	0.000%	0.00	0.00	0.00	0	0.00	0.00	4,403.80	0
Heptanes	100.202	0.782%	1.26	1.26	5.51	114	0.03	0.11	5,100.00	24,288
Benzene	78.114	0.114%	0.14	0.14	0.63	17	0.00	0.01	3,590.90	2,493
Toluene	92.141	0.046%	0.07	0.07	0.30	7	0.00	0.01	4,273.60	1,197
Ethylbenzene	106.167	0.002%	0.00	0.00	0.02	0	0.00	0.00	4,970.50	72
Xylenes	106.167	0.006%	0.01	0.01	0.04	1	0.00	0.00	4,957.10	179
Octanes	114.229	0.133%	0.24	0.24	1.07	19	0.00	0.02	5,796.00	4,695
2,2,4-Trimethylpentane	114.231	0.000%	0.00	0.00	0.00	0	0.00	0.00	5,778.80	0
Nonanes	128.255	0.011%	0.02	0.02	0.10	2	0.00	0.00	6,493.20	431
Decanes	142.282	0.001%	0.00	0.00	0.01	0	0.00	0.00	7,189.60	43
Totals =		**100.0%**	**67.29**	**67.29**	**294.73**	**14,610**	**--**	**--**	**--**	**1,331,169**
Total VOC =		**55.685%**	**49.43**	**49.43**	**216.53**	**--**	**0.99**	**4.33**	**Heat Value (Btu/scf)**	**2,187**
Total HAP =				**3.54**	**15.53**	**--**	**0.07**	**0.31**		
Total H_2S=				**0.00**	**0.00**	**--**	**0.00**	**0.00**		
MW of Stream =						**41.94**				

Notes:
1) Stream composition calculated with ProMax process simulation.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Tank Information

Equipment Information			
	TK-1	**TK-2, -3**	**WTK-1**
Contents[1]	Condensate	Condensate	Produced Water
Number of Tanks	1	2	1
Capacity (bbl)	400	400	400
Capacity (gal)	16,800	16,800	16,800
Total Throughput (bbl/yr)	146,836	146,836	107,178
Total Throughput (gal/yr)	6,167,121	6,167,121	4,501,476
Per Tank Throughput (bbl/yr)	146,836	146,836	107,178
Per Tank Throughput (gal/yr)	6,167,121	3,083,560	4,501,476
Emission Calculation Method	Process Simulation	Process Simulation	Process Simulation
VOC Tank Working Emission Factor (lb VOC/bbl)[2]	0.352	0.352	0.004
VOC Tank Breathing Losses (lb/yr)[2]	3,823.00	3,823.00	38.23
VOC Tank Flashing Emission Factor (lb VOC/bbl)[2]	2.36	N/A	0.024
CO_2 Tank Flashing Emission Factor (lb CO_2/bbl)[2]	0.022	N/A	0.000
CH_4 Tank Flashing Emission Factor (lb CH_4/bbl)[2]	0.244	N/A	0.002
Control Type	VOC Flare	VOC Flare	VOC Flare
Capture Efficiency[3]	99%	99%	99%
Control Efficiency[3]	98%	98%	98%

Notes:

1) Produced water tanks are assumed to contain 99% produced water and 1% condensate. Therefore, produced water emissions are assumed to be 1% of those calculated for condensate.

2) Working, breathing, and flashing calculated with ProMax process simulation. See attached reports and following tables.

3) Tank emissions are routed to the FL-1 with 99% capture efficiency and 98% control efficiency

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Condensate Tank Emissions Calculations

Unit ID: TK-1

Uncontrolled Emissions

Pollutant	Working Losses			Breathing Losses			Flashing Losses			Annual Emissions			Operating Hours			Conversion			Hourly Emissions[1]	
VOC[2]	25.83	TPY	+	1.91	TPY	+	173.27	TPY	=	**201.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**45.89**	**lb/hr**
n-Hexane	0.41	TPY	+	0.03	TPY	+	2.77	TPY	=	**3.22**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.73**	**lb/hr**
Benzene	0.23	TPY	+	0.02	TPY	+	1.56	TPY	=	**1.81**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.41**	**lb/hr**
Toluene	0.34	TPY	+	0.02	TPY	+	2.25	TPY	=	**2.61**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.60**	**lb/hr**
Ethylbenzene	0.03	TPY	+	<0.01	TPY	+	0.17	TPY	=	**0.20**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.05**	**lb/hr**
Xylenes	0.13	TPY	+	0.01	TPY	+	0.87	TPY	=	**1.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.23**	**lb/hr**
Other HAP	0.23	TPY	+	0.02	TPY	+	1.56	TPY	=	**1.81**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.41**	**lb/hr**
CO_2[3]	-	TPY	+	-	TPY	+	1.64	TPY	=	**1.64**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.38**	**lb/hr**
CH_4[3]	-	TPY	+	-	TPY	+	17.91	TPY	=	**17.91**	**TPY**	/	8,760	X	2,000	lb/ton	=	**4.09**	**lb/hr**

Controlled Emissions[4]

Pollutant	Working Losses			Breathing Losses			Flashing Losses			Annual Emissions			Operating Hours			Conversion			Hourly Emissions	
VOC	0.77	TPY	+	0.06	TPY	+	5.16	TPY	=	**5.99**	**TPY**	/	8,760	X	2,000	lb/ton	=	**1.37**	**lb/hr**
n-Hexane	0.01	TPY	+	<0.01	TPY	+	0.08	TPY	=	**0.10**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.02**	**lb/hr**
Benzene	0.01	TPY	+	<0.01	TPY	+	0.05	TPY	=	**0.05**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.01**	**lb/hr**
Toluene	0.01	TPY	+	<0.01	TPY	+	0.07	TPY	=	**0.08**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.02**	**lb/hr**
Ethylbenzene	<0.01	TPY	+	<0.01	TPY	+	0.01	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Xylenes	<0.01	TPY	+	<0.01	TPY	+	0.03	TPY	=	**0.03**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.01**	**lb/hr**
Other HAP	0.01	TPY	+	<0.01	TPY	+	0.05	TPY	=	**0.05**	**TPY**	/	8,760	X	2000	lb/ton	=	**0.01**	**lb/hr**
CO_2	-	TPY	+	-	TPY	+	0.05	TPY	=	**0.05**	**TPY**	/	8,760	X	2000	lb/ton	=	**0.01**	**lb/hr**
CH_4	-	TPY	+	-	TPY	+	0.53	TPY	=	**0.53**	**TPY**	/	8,760	X	2000	lb/ton	=	**0.12**	**lb/hr**

Estimated HAP Composition (% by Weight)[5]

Pollutant	Wt%
n-Hexane	1.600%
Benzene	0.900%
Toluene	1.300%
Ethylbenzene	0.100%
Xylenes	0.500%
Other HAP	0.900%
Total HAP =	5.300%

Notes:
1) Due to variable short-term emission rates, average lb/hr based on annual emissions shown for reference only.
2) VOC TPY breathing losses calculated from lb/yr ProMax flash emission results as follows: lb/yr * 1/2000 = TPY. VOC working losses and VOC, CO_2 and CH_4 TPY flashing losses calculated with ProMax flash emission factor as follows: lb/bbl factor * annual bbl throughput * 1/2000 = TPY.

3) Per API Chapter 5: CH_4 and CO_2 emissions from crude storage tanks occur mainly as a result of flashing; working and breathing loss emissions of these gases are very small in production and virtually non-existent in downstream segments. Unless site-specific data indicate otherwise, working and breathing losses are presumed to contain no CH_4 or CO_2 .

4) Condensate tank emissions are routed to the VOC flare with 99% capture efficiency and 99% combustor control efficiency for 98.01% effective control efficiency. ORM requested a federally enforceable limit of 5.99 tons per year per tank by adding the tanks to the North Dakota Tank Registry.

5) HAP composition of tank vapors calculated with representative ProMax process simulation.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Condensate Tank Emissions Calculations

Unit ID: **TK-2 - TK-3[1]** **(EACH)**

Uncontrolled Emissions

Pollutant	Working Losses			Breathing Losses			Flashing Losses			Annual Emissions			Operating Hours			Conversion			Hourly Emissions[2]	
VOC[3]	25.84	TPY	+	1.91	TPY	+	0.00	TPY	=	**27.75**	**TPY**	/	8,760	X	2,000	lb/ton	=	**6.34**	**lb/hr**
n-Hexane	0.41	TPY	+	0.03	TPY	+	0.00	TPY	=	**0.44**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.10**	**lb/hr**
Benzene	0.23	TPY	+	0.02	TPY	+	0.00	TPY	=	**0.25**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.06**	**lb/hr**
Toluene	0.34	TPY	+	0.02	TPY	+	0.00	TPY	=	**0.36**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.08**	**lb/hr**
Ethylbenzene	0.03	TPY	+	<0.01	TPY	+	0.00	TPY	=	**0.03**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.01**	**lb/hr**
Xylenes	0.13	TPY	+	0.01	TPY	+	0.00	TPY	=	**0.14**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.03**	**lb/hr**
Other HAP	0.23	TPY	+	0.02	TPY	+	0.00	TPY	=	**0.25**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.06**	**lb/hr**
CO_2[4]	-	TPY	+	-	TPY	+	0.00	TPY	=	**0.00**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.00**	**lb/hr**
CH_4[4]	-	TPY	+	-	TPY	+	0.00	TPY	=	**0.00**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.00**	**lb/hr**

Controlled Emissions[5]

Pollutant	Working Losses			Breathing Losses			Flashing Losses			Annual Emissions			Operating Hours			Conversion			Hourly Emissions	
VOC	0.77	TPY	+	0.06	TPY	+	0.00	TPY	=	**0.83**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.19**	**lb/hr**
n-Hexane	0.01	TPY	+	<0.01	TPY	+	0.00	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Benzene	0.01	TPY	+	<0.01	TPY	+	0.00	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Toluene	0.01	TPY	+	<0.01	TPY	+	0.00	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Ethylbenzene	<0.01	TPY	+	<0.01	TPY	+	0.00	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Xylenes	<0.01	TPY	+	<0.01	TPY	+	0.00	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Other HAP	0.01	TPY	+	<0.01	TPY	+	0.00	TPY	=	**0.01**	**TPY**	/	8,760	X	2000	lb/ton	=	**<0.01**	**lb/hr**
CO_2	-	TPY	+	-	TPY	+	0.00	TPY	=	**0.00**	**TPY**	/	8,760	X	2000	lb/ton	=	**0.00**	**lb/hr**
CH_4	-	TPY	+	-	TPY	+	0.00	TPY	=	**0.00**	**TPY**	/	8,760	X	2000	lb/ton	=	**0.00**	**lb/hr**

Estimated HAP Composition (% by Weight)[6]

Pollutant	Wt%
n-Hexane	1.600%
Benzene	0.900%
Toluene	1.300%
Ethylbenzene	0.100%
Xylenes	0.500%
Other HAP	0.900%
Total HAP =	**5.300%**

Notes:

1) The tanks are connected in one series of three tanks; therefore, condensate flows through each tank in each series and only flashes at the inlet to the first tank in each series (TK-1).

2) Due to variable short-term emission rates, average lb/hr based on annual emissions shown for reference only.

3) VOC TPY breathing losses calculated from lb/yr ProMax flash emission results as follows: lb/yr * 1/2000 = TPY. VOC working losses and VOC, CO_2 and CH_4 TPY flashing losses calculated with ProMax flash emission factor as follows: lb/bbl factor * annual bbl throughput * 1/2000 = TPY.

4) Per API Chapter 5: CH_4 and CO_2 emissions from crude storage tanks occur mainly as a result of flashing; working and breathing loss emissions of these gases are very small in production and virtually non-existent in downstream segments. Unless site-specific data indicate otherwise, working and breathing losses are presumed to contain no CH_4 or CO_2 .

5) Condensate tank emissions are routed to the combustor with 98% capture efficiency and 98% control efficiency, for 96.04% effective control efficiency. ORM requested a federally enforceable limit of 5.99 tons per year per tank by adding the tanks to the North Dakota Tank Registry.

6) HAP composition of tank vapors calculated with site-specific ProMax process simulation.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Produced Water Tank Emissions Calculations

Unit ID: WTK-1

Uncontrolled Emissions

Pollutant	Working Losses			Breathing Losses			Flashing Losses			Annual Emissions			Operating Hours			Conversion			Hourly Emissions[1]	
VOC[2]	<0.01	TPY	+	0.02	TPY	+	1.26	TPY	=	**1.28**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.29**	**lb/hr**
n-Hexane	<0.01	TPY	+	<0.01	TPY	+	0.02	TPY	=	**0.02**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Benzene	<0.01	TPY	+	<0.01	TPY	+	0.01	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Toluene	<0.01	TPY	+	<0.01	TPY	+	0.02	TPY	=	**0.02**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Ethylbenzene	<0.01	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Xylenes	<0.01	TPY	+	<0.01	TPY	+	0.01	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Other HAP	<0.01	TPY	+	<0.01	TPY	+	0.01	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
CO_2[3]	-	TPY	+	-	TPY	+	0.01	TPY	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
CH_4[3]	-	TPY	+	-	TPY	+	0.13	TPY	=	**0.13**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.03**	**lb/hr**

Controlled Emissions[4]

Pollutant	Working Losses			Breathing Losses			Flashing Losses			Annual Emissions			Operating Hours			Conversion			Hourly Emissions	
VOC	<0.01	TPY	+	<0.01	TPY	+	0.04	TPY	=	**0.04**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.01**	**lb/hr**
n-Hexane	<0.01	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Benzene	0.00	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Toluene	<0.01	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Ethylbenzene	0.00	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Xylenes	0.00	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Other HAP	0.00	TPY	+	<0.01	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2000	lb/ton	=	**<0.01**	**lb/hr**
CO_2	-	TPY	+	-	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2000	lb/ton	=	**<0.01**	**lb/hr**
CH_4	-	TPY	+	-	TPY	+	<0.01	TPY	=	**<0.01**	**TPY**	/	8,760	X	2000	lb/ton	=	**<0.01**	**lb/hr**

Estimated HAP Composition (% by Weight)[5]

Pollutant	Wt%
n-Hexane	1.600%
Benzene	0.900%
Toluene	1.300%
Ethylbenzene	0.100%
Xylenes	0.500%
Other HAP	0.900%
Total HAP =	**5.300%**

Notes:

1) Due to variable short-term emission rates, average lb/hr based on annual emissions shown for reference only.

2) VOC TPY working and breathing losses calculated from lb/yr TANKS 4.0.9d results as follows: lb/yr * 1/2000 = TPY. VOC TPY flashing losses calculated with ProMax flash emission factor as follows: lb VOC/bbl * annual bbl throughput * 1/2000 = TPY.

3) Per API Chapter 5: CH_4 and CO_2 emissions from crude storage tanks occur mainly as a result of flashing; working and breathing loss emissions of these gases are very small in production and virtually non-existent in downstream segments. Unless site-specific data indicate otherwise, working and breathing losses are presumed to contain no CH_4 or CO_2 .

4) Water tank emissions are routed to the VOC flare with 99% capture efficiency and 99% combustor control efficiency for 98.01% effective control efficiency.

5) HAP composition of tank vapors calculated with site-specific ProMax process simulation.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Truck Loading Information

Equipment Information	
	TL-1
Contents Loaded	Condensate
Fill Method	Submerged
Type of Service	Dedicated
Mode of Operation	Normal
Saturation Factor	0.6
Throughput (1000 gal/yr)	6,167
Throughput (10^6 gal/yr)	6.167
Maximum Loading Rate (gal/hr)	7,500
VOC Emission Factor (lb/bbl)	0.1600
ProMax Flash Gas CH_4 wt%	0.015%
ProMax Flash Gas CO_2 wt%	0.004%
Control Type	None

Notes:
1) Based on vapor analysis of loading operations at nine ORM facilities.

2) API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry, Table 5-12. Emission factor converted as follows: tonne/10^6 gal * 1.10231131 ton/tonne.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Condensate Truck Loading Emissions Calculations

Unit ID: TL-1

Uncontrolled Emissions

Pollutant	Emission Factor			Throughput			Conversion			Annual Emissions			Operating Hours		Conversion			Average Hourly Emissions[1]	
VOC	0.1600	lb/bbl	X	146,836	bbl/yr	X	0.0005	ton/lb	=	**11.75**	**TPY**	/	8,760	X	2,000	lb/ton	=	**2.68**	**lb/hr**
n-Hexane	-	-	-	-	-	-	-	-	=	**0.19**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.04**	**lb/hr**
Benzene	-	-	-	-	-	-	-	-	=	**0.11**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.02**	**lb/hr**
Toluene	-	-	-	-	-	-	-	-	=	**0.15**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.03**	**lb/hr**
Ethylbenzene	-	-	-	-	-	-	-	-	=	**0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
Xylenes	-	-	-	-	-	-	-	-	=	**0.06**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.01**	**lb/hr**
Other HAP	-	-	-	-	-	-	-	-	=	**0.11**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.02**	**lb/hr**
CO_2	1.00	ton/10^6 gal	X	6.167	10^6 gal/yr	X	0.004%	Wt%	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**
CH_4	1.00	ton/10^6 gal	X	6.167	10^6 gal/yr	X	0.015%	Wt%	=	**<0.01**	**TPY**	/	8,760	X	2,000	lb/ton	=	**<0.01**	**lb/hr**

Estimated HAP Composition (% by Weight)[2]

Pollutant	Wt%
n-Hexane	1.600%
Benzene	0.900%
Toluene	1.300%
Ethylbenzene	0.100%
Xylenes	0.500%
Other HAP	0.900%
Total HAP =	**5.300%**

Notes:
1) Due to variable short-term emission rates, average lb/hr rate shown for reference only.
2) See speciated liquids analysis on Facility Analyses page. HAP weight% calculated as % of total hydrocarbons in the sample. All HAP assumed to volatize from liquids for most conservative emissions estimate.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Methanol Tank Information

Equipment Information	
	MTK-1
Contents	Methanol
Number of Tanks	1
Capacity (bbl)	400
Capacity (gal)	16,800
Total Throughput (bbl/yr)	6,811
Total Throughput (gal/yr)	286,062
Per Tank Throughput (bbl/yr)	6,811
Per Tank Throughput (gal/yr)	286,062
ODEQ Calculation Tool Working Losses (lb/yr)[2]	204.60
ODEQ Calculation Tool Breathing Losses (lb/yr)[2]	130.60
Control Type	None

Notes:
1) Working and breathing calculated using ODEQ Calculation Tool. See attached reports and following table.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Methanol Tank Emissions Calculations

Unit ID: **MTK-1**

Uncontrolled Emissions

Pollutant	Working Losses			Breathing Losses			Annual Emissions			Operating Hours		Conversion			Hourly Emissions[1]	
VOC/Methanol [2]	0.10	TPY	+	0.07	TPY	=	**0.17**	**TPY**	/	8,760	X	2,000	lb/ton	=	**0.04**	**lb/hr**

Notes:
1) Due to variable short-term emission rates, average lb/hr based on annual emissions shown for reference only.
2) VOC TPY working and breathing losses calculated from lb/yr TANKS 4.0.9d results as follows: lb/yr * 1/2000 = TPY.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Fugitive Equipment Data and Emission Factors

Equipment Information - Gas Service							TOC Emissions											
Component	Count[1]		Emission Factor[2]		Control Efficiency			Hourly Emissions		Operating Hours		Conversion			Annual Emissions	
Valves - Gas	750	X	9.92E-03	lb/hr/source	X	75.00%	=	1.86	lb/hr	X	8,760	X	0.0005	ton/lb	=	8.15	TPY
Connectors - Gas	1900	X	4.41E-04	lb/hr/source	X	30.00%	=	0.59	lb/hr	X	8,761	X	0.0005	ton/lb	=	2.57	TPY
Flanges - Gas	1000	X	8.60E-04	lb/hr/source	X	30.00%	=	0.60	lb/hr	X	8,760	X	0.0005	ton/lb	=	2.64	TPY
Relief Valves - Gas	60	X	1.94E-02	lb/hr/source	X	0.00%	=	1.16	lb/hr	X	8,760	X	0.0005	ton/lb	=	5.10	TPY
Compressor Seals - Gas	16	X	1.94E-02	lb/hr/source	X	75.00%	=	0.08	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.34	TPY
Other - Gas	10	X	1.94E-02	lb/hr/source	X	0.00%	=	0.19	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.85	TPY

Equipment Information - Liquid Service							TOC Emissions											
Component	Count[1]		Emission Factor[2]		Control Efficiency			Hourly Emissions		Operating Hours		Conversion			Annual Emissions	
Valves - Light Oil	380	X	5.51E-03	lb/hr/source	X	75.00%	=	0.52	lb/hr	X	8,760	X	0.0005	ton/lb	=	2.29	TPY
Flanges - Light Oil	40	X	2.43E-04	lb/hr/source	X	30.00%	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.03	TPY
Connectors - Light Oil	1,100	X	4.63E-04	lb/hr/source	X	30.00%	=	0.36	lb/hr	X	8,760	X	0.0005	ton/lb	=	1.56	TPY
Pump Seals - Light Oil	2	X	2.87E-02	lb/hr/source	X	75.00%	=	0.01	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.06	TPY
Other - Light Oil	5	X	1.65E-02	lb/hr/source	X	0.00%	=	0.08	lb/hr	X	8,760	X	0.0005	ton/lb	=	0.36	TPY

Notes:
1) Component counts estimated based on similar site.
2) Emission Factor Source: EPA-453/R-95-017. TOC multiplied by pollutant content of streams (weight %) to obtain pollutant emissions.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Fugitive Emissions Calculations

Component	VOC Emissions				CO_2 Emissions				CH_4 Emissions				H_2S Emissions			
Valves - Gas	0.70	lb/hr	3.08	TPY	0.02	lb/hr	0.11	TPY	0.70	lb/hr	3.07	TPY	0.00	lb/hr	0.00	TPY
Connectors - Gas	0.22	lb/hr	0.97	TPY	0.01	lb/hr	0.03	TPY	0.22	lb/hr	0.97	TPY	0.00	lb/hr	0.00	TPY
Flanges - Gas	0.23	lb/hr	1.00	TPY	0.01	lb/hr	0.03	TPY	0.23	lb/hr	0.99	TPY	0.00	lb/hr	0.00	TPY
Relief Valves - Gas	0.44	lb/hr	1.93	TPY	0.02	lb/hr	0.07	TPY	0.44	lb/hr	1.92	TPY	0.00	lb/hr	0.00	TPY
Compressor Seals - Gas	0.03	lb/hr	0.13	TPY	<0.01	lb/hr	<0.01	TPY	0.03	lb/hr	0.13	TPY	0.00	lb/hr	0.00	TPY
Other - Gas	0.07	lb/hr	0.32	TPY	<0.01	lb/hr	0.01	TPY	0.07	lb/hr	0.32	TPY	0.00	lb/hr	0.00	TPY
Valves - Light Oil	0.52	lb/hr	2.28	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Flanges - Light Oil	0.01	lb/hr	0.03	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Connectors - Light Oil	0.36	lb/hr	1.56	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Pump Seals - Light Oil	0.01	lb/hr	0.06	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Other - Light Oil	0.08	lb/hr	0.36	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Total	**2.67**	**lb/hr**	**11.71**	**TPY**	**0.06**	**lb/hr**	**0.26**	**TPY**	**1.69**	**lb/hr**	**7.40**	**TPY**	**0.00**	**lb/hr**	**0.00**	**TPY**

Component	n-Hexane Emissions				Benzene Emissions				Toluene Emissions				Ethylbenzene Emissions				Xylene Emissions				2,2,4-Trimethylpentane Emissions			
Valves - Gas	0.01	lb/hr	0.04	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY
Connectors - Gas	<0.01	lb/hr	0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY
Flanges - Gas	<0.01	lb/hr	0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY
Relief Valves - Gas	0.01	lb/hr	0.03	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY
Compressor Seals - Gas	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY
Other - Gas	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY
Valves - Light Oil	0.11	lb/hr	0.47	TPY	<0.01	lb/hr	0.02	TPY	0.01	lb/hr	0.04	TPY	<0.01	lb/hr	0.01	TPY	0.01	lb/hr	0.02	TPY	0.00	lb/hr	0.00	TPY
Flanges - Light Oil	<0.01	lb/hr	0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Connectors - Light Oil	0.07	lb/hr	0.32	TPY	<0.01	lb/hr	0.01	TPY	0.01	lb/hr	0.02	TPY	<0.01	lb/hr	0.01	TPY	<0.01	lb/hr	0.02	TPY	0.00	lb/hr	0.00	TPY
Pump Seals - Light Oil	<0.01	lb/hr	0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Other - Light Oil	0.02	lb/hr	0.07	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	0.01	TPY	<0.01	lb/hr	<0.01	TPY	<0.01	lb/hr	<0.01	TPY	0.00	lb/hr	0.00	TPY
Total	**0.22**	**lb/hr**	**0.98**	**TPY**	**0.01**	**lb/hr**	**0.05**	**TPY**	**0.02**	**lb/hr**	**0.08**	**TPY**	**<0.01**	**lb/hr**	**0.01**	**TPY**	**0.01**	**lb/hr**	**0.05**	**TPY**	**<0.01**	**lb/hr**	**0.01**	**TPY**

Notes:
1) TOC from previous table multiplied by pollutant content of streams (weight%) to obtain pollutant emissions. See attached analyses table.

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ONEOK Rockies Midstream, L.L.C.
Boulder Compressor Station
Miscellaneous Venting and Blowdown Emissions Calculations

Component	Molecular Weight	Stream 1 Inlet Gas	Emissions	
		Mole %	scf/yr[1]	TPY[2]
Hydrogen Sulfide	34.081	0.000%	0	0.00
Carbon Dioxide	44.010	0.768%	3,594	0.21
Nitrogen	28.013	2.471%	11,565	0.43
Helium	4.003	0.000%	0	0.00
Oxygen	31.999	0.000%	0	0.00
Methane	16.043	58.397%	273,297	5.78
Ethane	30.069	20.291%	94,964	3.76
Propane	44.096	10.713%	50,136	2.91
i-Butane	58.122	1.168%	5,466	0.42
n-Butane	58.122	3.672%	17,184	1.32
i-Pentane	72.149	0.673%	3,150	0.30
n-Pentane	72.149	1.029%	4,815	0.46
n-Hexane	86.175	0.157%	732	0.08
Other Hexanes	86.175	0.435%	2,036	0.23
Heptanes	100.202	0.082%	384	0.05
Benzene	78.114	0.017%	79	0.01
Toluene	92.141	0.013%	61	0.01
Ethylbenzene	106.167	0.001%	4	<0.01
Xylenes	106.167	0.004%	18	<0.01
Octanes	114.229	0.000%	0	0.00
2,2,4-Trimethylpentane	114.231	0.008%	39	0.01
Nonanes	128.255	0.000%	0	0.00
Decanes	142.282	0.000%	0	0.00
	Totals =	99.898%	**467,525**	**15.97**
		Total VOC =	**84,104**	**5.80**
		Total HAP =	**933**	**0.11**

Estimated Annual Volume 468,000 scf/yr
Molar volume conversion @60° F and 1 atm: 1 lb/mole = 379.4 scf

Notes:
1) Calculated as follows: Total Losses scf/yr * mol% of component.
2) Calculated as follows: component scf/yr / 379.4 molar volume conversion * MW component / 2000 lb/ton.

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MIRATECH

Equipment Specification

Proposal Information

Proposal Number:	RJ-23-003078	Date:	**5/9/2023**
Project Reference:	OP2766-Q2346 One-OK		

Engine Information

Engine Make:	Caterpillar	Speed:	Rated
Engine Model:	G3608	Power Output:	2,500 bhp
Rated Speed:	1000 RPM	Exhaust Flow Rate:	16,205 acfm (cfm)
Fuel Description:	Natural Gas	Exhaust Temperature:	784 ° F
Hours Of Operation:	8760 Hours per year	O_2:	11.9%
Load:	100%	H_2O:	15%

Emission Data (100% Load)

Emission	Raw Engine Emissions						Target Outlet Emissions						Calculated Reduction
	g/bhp-hr	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	*g/bhp-hr*	*tons/yr*	*ppmvd @ 15% O_2*	*ppmvd*	*g/kW-hr*	*lb/MW-hr*	
NO_x*	*0.3*	7.24	26	39	0.402	0.89							
CO	*4.51*	108.87	639	974	6.048	13.33	1.13	27.22	160	244	1.512	3.33	*75%*
NMNEHC**	*1.46*	35.25	361	551	1.958	4.32	0.73	17.62	181	275	0.979	2.16	50%
CH_2O	*0.17*	4.1	22	34	0.228	0.5	0.08	2.05	11	17	0.114	0.25	*50%*

System Specifications

Catalyst (Replacement Catalyst)

Element Model Number:	MECB-OX-SB2700-2421-2338-291
Number of Catalyst Layers:	1
Number of Catalyst Per Layer:	2
Catalyst Back Pressure:	0.0 inWC (Clean)
Design Exhaust Flow Rate:	16,205 acfm
Design Exhaust Temperature:	784f
Dimensions:	24.21 in x 23.38 in
Exhaust Temperature Limits***:	550f – 1250f (catalyst inlet); 1350f (catalyst outlet)

* MW referenced as NO_2

** MW referenced as CH_4. Propane in the exhaust shall not exceed 15% by volume of the NMHC compounds in the exhaust, excluding aldehydes. The 15% (vol.) shall be established on a wet basis, reported on a methane molecular weight basis. The measurement of exhaust NMHC composition shall be based upon EPA method 320 (FTIR), and shall exclude formaldehyde.

*** General catalyst temperature operating range. Performance is based on the Design Exhaust Temperature.

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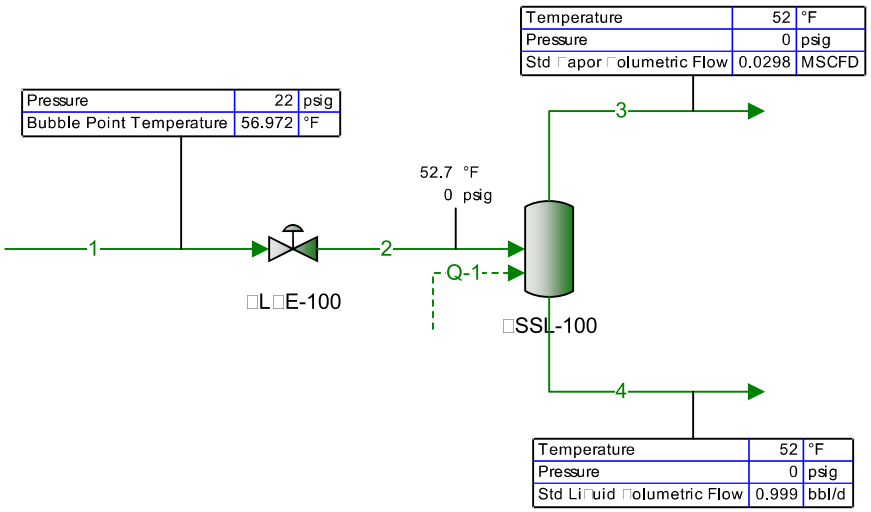
□ala□y – Flash Calc 9/19/2018

Sample Pressure: 22 psig
Sample Temperature: 60 F



Atm Tan□ Losses

Working Losses Factor - 0.3518 lb/d

Breathing Losses Factor -3,823 lb/yr

Flashing Losses Factor - 2.36 lb/d

CO2 Tank Flashing Emission Factor - 0.005395 lb CO2/bbl

CH4 Tank Flashing Emission Factor - 0.2381 lb CH4/bbl

Names	□nits	1	2	3	4
Temperature	°F	57	52.7	52*	52
Pressure	psig	22*	0*	0	0
Mole Fraction □apor	%	0*	3.02	100	0
Molecular Weight	lb/lbmol	90.3	90.3	41.4	91.8
Mass Density	lb/ft□3	42.7	6.46	0.105	43
Mass Flow	lb/h	10	10	0.136	9.9
Molar Flow	lbmol/h	0.111	0.111	0.00328	0.108
Compressibility		0.0136	0.0349	0.985	0.00534
Specific Gravity		0.684		1.43	0.689
Std □apor □olumetric Flow	MMSCFD	0.00101	0.00101	2.98e-05	0.000982
Std Li□uid □olumetric Flow	sgpm	0.0297□	0.0297	0.000562	0.0291
Enthalpy	MMBtu/h	-0.00953	-0.00953	-0.000146	-0.00939

Names	□nits	1	2	3	4
N2(Mole Fraction)	%	0.030001*	0.030001	0.97061	0.0014108
CO2(Mole Fraction)	%	0.0070002*	0.0070002	0.15591	0.002474
C1(Mole Fraction)	%	0.65502*	0.65502	18.876	0.1012
C2(Mole Fraction)	%	1.7811*	1.7811	26.616	1.0262
C3(Mole Fraction)	%	4.1091*	4.1091	24.146	3.5001
iC4(Mole Fraction)	%	1.583*	1.583	3.7436	1.5174
nC4(Mole Fraction)	%	8.1042*	8.1042	12.775	7.9623
iC5(Mole Fraction)	%	6.0012*	6.0012	3.704	6.071
nC5(Mole Fraction)	%	12.923*	12.923	5.754	13.141
C6(Mole Fraction)	%	18.769*	18.769	2.2195	19.272
C7(Mole Fraction)	%	21.629*	21.629	0.72876	22.264
C8(Mole Fraction)	%	14.179*	14.179	0.13362	14.606
C9(Mole Fraction)	%	3.8651*	3.8651	0.010132	3.9823
C11(Mole Fraction)	%	0*	0	0	0
C12(Mole Fraction)	%	0*	0	0	0
Ben□ene(Mole Fraction)	%	1.023*	1.023	0.12295	1.0504
Toluene(Mole Fraction)	%	1.139*	1.139	0.0349	1.1726
Ethylben□ene(Mole Fraction)	%	0.22001*	0.22001	0.0019465	0.22663
o-Xylene(Mole Fraction)	%	1.057*	1.057	0.0071934	1.0889
m-Xylene(Mole Fraction)	%	0*	0	0	0
p-Xylene(Mole Fraction)	%	0*	0	0	0
C10□(Mole Fraction)	%	2.9251*	2.9251	4.2485e-06	3.014

OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY
AQD Storage Tank Calculation Tool (21294)
Calculation Report
Based on AP-42 (06/2020) Section 7.1: Organic Liquid Storage Tanks

Print this page

INPUT SUMMARY

Identification

Tank type	Vertical Fixed Roof
Tank identifier	MTK-1
Description:	400-bbl Methanol Tank

Meteorological Data:

Nearest major city:	Williston, ND

Tank Contents:

Data source	Calculator Database
Liquid category	Other Organic Liquids
Liquid name	Methyl alcohol {methanol}

Tank Dimensions:

Tank shell height, ft	H_S	20.0000
Tank diameter, ft	D	12.0000
Maximum liquid height, ft	H_{LX}	19.0000
Minimum liquid height, ft	H_{LN}	1.0000
Liquid height, ft	H_L	10.0000
Number of turnovers per year, dimensionless	N	18.7827
Annual net throughput, gal/yr		286,062.0000
Annual net throughput, bbl/yr	Q	6,811.0000
Flashing/vapor balanced unloading?		No

Paint Characteristics:

Shell color/shade	Tan
Shell condition	Average
Roof color/shade	Tan
Roof condition	Average

Roof Characteristics:

Roof type		Cone Roof
Tank roof height, ft	H_R	0.0000
Tank cone roof slope, ft/ft	S_R	0.0625

Breather Vent Settings:

Breather vent vacuum setting, psig	P_{BV}	-0.0300
Breather vent pressure setting, psig	P_{BP}	0.0300

Insulation Characteristics:

Tank insulation	None
Tank heating	No

METEOROLOGICAL DATA

Nearest major city:		Williston, ND
Average daily ambient temperature, °R	T_{AA}	501.2500
Average daily minimum ambient temperature, °R	T_{AN}	489.6000
Average daily maximum ambient temperature, °R	T_{AX}	512.9000
Average daily ambient temperature range, °R	ΔT_A	23.3000
Average wind speed, mph	v	8.9000
Average daily total insolation factor, Btu/ft^2•d	I	1,193.0000
Atmospheric pressure, psi	P_A	13.7200

LIQUID DATA

Liquid category		Other Organic Liquids
Liquid name		Methyl alcohol {methanol}
Liquid bulk temperature, °R	T_B	503.0037
Average daily liquid surface temperature, °R	T_{LA}	504.4931
Average daily minimum liquid surface temperature, °R	T_{LN}	497.2650
Average daily maximum liquid surface temperature, °R	T_{LX}	511.7213
Vapor pressure at average daily liquid surface temperature, psia	P_{VA}	0.9068
Vapor pressure at the average daily minimum liquid surface temperature, psia	P_{VN}	0.7104
Vapor pressure at the average daily maximum liquid surface temperature, psia	P_{VX}	1.1484
Vapor molecular weight, lb/lb-mole	M_V	32.0400
Constant in vapor pressure equation, dimensionless	A	8.0790
Constant in vapor pressure equation, °C	B	1,581.3000
Constant in vapor pressure equation, °C	C	239.6500

CALCULATION DETAILS

Standing Losses

Standing losses, lb/yr	L_S	130.6005
Vapor space volume, ft^3	V_V	1,145.1105
Vapor density, lb/ft^3	W_V	0.0054
Vapor space expansion factor, per day	K_E	0.0868
Vented vapor saturation factor, dimensionless	K_S	0.6727

Vapor Space Volume

Vapor space volume, ft^3	V_V	1,145.1105
Tank diameter, ft	D	12.0000
Vapor space outage, ft	H_{VO}	10.1250

Vapor Space Outage

Vapor space outage, ft	H_{VO}	10.1250
Tank shell height, ft	H_S	20.0000
Liquid height, ft	H_L	10.0000
Roof outage, ft	H_{RO}	0.1250

Roof Outage

Roof outage, ft	H_{RO}	0.1250
Tank roof height, ft	H_R	0.3750
Tank shell radius, ft	R_S	6.0000
Tank cone roof slope, ft/ft	S_R	0.0625

Vapor Density

Vapor density, lb/ft^3	W_V	0.0054
Vapor molecular weight, lb/lb-mole	M_V	32.0400
Vapor pressure at average daily liquid surface temperature, psia	P_{VA}	0.9068
Ideal gas constant, psia•ft^3/lb-mole•°R	R	10.7310
Average vapor temperature, °R	T_V	505.9826
Tank roof surface solar absorptance, dimensionless	α_R	0.4900
Tank shell surface solar absorptance, dimensionless	α_S	0.4900
Average daily total insolation factor, Btu/ft^2•d	I	1,193.0000

Vapor Space Expansion Factor

Vapor space expansion factor, per day	K_E	0.0868
Average daily vapor temperature range, °R	ΔT_V	28.9126
Average daily vapor pressure range, psi	ΔP_V	0.4380
Breather vent pressure setting range, psig	ΔP_B	0.0600
Atmospheric pressure, psi	P_A	13.7200

Vapor pressure at average daily liquid surface temperature, psia	P_{VA}	0.9068
Average daily liquid surface temperature, °R	T_{LA}	504.4931

Vented Vapor Saturation Factor

Vented vapor saturation factor, dimensionless	K_S	0.6727
Vapor pressure at average daily liquid surface temperature, psia	P_{VA}	0.9068
Vapor space outage, ft	H_{VO}	10.1250

Working Losses

Working losses, lb/yr	L_W	204.5961
Net working loss throughput, ft^3/yr	V_Q	38,236.9540
Turnover factor, dimensionless	K_N	1.0000
Working loss product factor for fixed roof tanks, dimensionless	K_P	1.0000
Vapor density, lb/ft^3	W_V	0.0054
Vent setting correction factor, dimensionless	K_B	1.0000

EMISSIONS SUMMARY

Total Losses

Standing losses, lb/yr	L_S	130.6005
Working losses, lb/yr	L_W	204.5961
Total routine losses, lb/yr	L_T	335.1966