

**AIR QUALITY EFFECTS ANALYSIS  
FOR  
PERMIT TO CONSTRUCT  
ACP-18220 v1.0**

**Applicant:**

ONEOK Rockies Midstream, L.L.C.  
100 West Fifth Street  
Tulsa, Oklahoma 74103

**Facility Location:**

Boulder Compressor Station  
15287 52<sup>nd</sup> Street NW  
Williston, North Dakota 58801  
48.169694, -103.990387  
SW ¼, SW ¼, Sec. 7, T154N, R103W  
Williams County

**Introduction:**

ONEOK Rockies Midstream, L.L.C. submitted a permit to construct application to the North Dakota Department of Environmental Quality – Division of Air Quality (Department) on October 5, 2023. The application was for the construction of a new natural gas pipeline compressor station, Boulder Compressor Station (facility), to be located in Williams County, North Dakota.

The facility will consist of three 2,500 hp Caterpillar compressor engines (EUs C-1, C-2, & C-3), three 400-bbl condensate tanks (EUs TK-1, TK-2, & TK-3), one 400-bbl produced water tank (EU WTK-1), one 400-bbl methanol tank (EU MTK-1), and one process/VOC flare (EU FL-1). Upon completion, the facility will be a synthetic minor source.

Table 1 lists the emissions units associated with the Boulder Compressor Station.

Table 1 - Source-wide Permitted Equipment.

<b>Emission Unit Description <sup>A</sup></b>	<b>Emission Unit (EU)</b>	<b>Emission Point (EP)</b>	<b>Air Pollution Control Equipment</b>
Caterpillar G3608 (ADEM4) (4SLB) natural gas-fired engine rated at 2,500 hp (NSPS JJJJ, NESHAP ZZZZ)	C-1	C-1	Non-Selective Catalytic Reduction (NSCR)
Caterpillar G3608 (ADEM4) (4SLB) natural gas-fired engine rated at 2,500 hp (NSPS JJJJ, NESHAP ZZZZ)	C-2	C-2	NSCR
Caterpillar G3608 (ADEM4) (4SLB) natural gas-fired engine rated at 2,500 hp (NSPS JJJJ, NESHAP ZZZZ)	C-3	C-3	NSCR
Three 400-barrel condensate tanks	TK-1 through TK-3	FL-1	Process/VOC flare (EU FL-1)
400-barrel produced water tank	WTK-1	FL-1	FL-1
400-barrel methanol tank	MTK-1	MTK-1	Submerged Fill Pipe (SFP)
Process/VOC flare	FL-1	FL-1	None
Condensate truck loading	TL-1	TL-1	None
Fugitives (NSPS OOOOb)	FUG	FUG	Leak Detection and Repair (LDAR)

<sup>A</sup> All emission unit ratings are considered nominal ratings.

**Facility Wide Emissions Profile**  
**Potential to Emit (PTE)**

Table 2 - PTE (tons per year) <sup>A</sup>

Emission Unit Description	EU	CO	NO <sub>x</sub>	SO <sub>2</sub>	VOCs	Total PM	Total HAPs	Formaldehyde (Largest HAP)
Natural gas-fired compressor engine	C-1	27.3	24.1	0.0	16.9	0.8	2.4	1.9
	C-2	27.3	24.1	0.0	16.9	0.8	2.4	1.9
	C-3	27.3	24.1	0.0	16.9	0.8	2.4	1.9
400-barrel condensate storage tank	TK-1	-	-	-	6.0	-	0.3	-
400-barrel condensate storage tank	TK-2	-	-	-	0.8	-	0.0	-
400-barrel condensate storage tank	TK-3	-	-	-	0.8	-	0.0	-
400-barrel produced water storage tank	WTK-1	-	-	-	0.0	-	0.0	-
400-barrel methanol tank	MTK-1	-	-	-	0.2	-	0.2	-
Process/VOC flare	FL-1	2.6	1.1	0.0	0.3	0.1	0.0	0.0
Condensate truck loading	TL-1	-	-	-	11.8	-	0.6	-
Miscellaneous <sup>B</sup>	BD	-	-	-	5.8	-	0.1	-
Fugitives	FUG	-	-	-	12.1	-	1.2	-
<b>Total (without Fugitives):</b>		<b>84.4</b>	<b>73.5</b>	<b>0.1</b>	<b>76.4</b>	<b>2.4</b>	<b>8.5</b>	<b>5.8</b>
<b>Total (with Fugitives):</b>		<b>84.4</b>	<b>73.5</b>	<b>0.1</b>	<b>88.6</b>	<b>2.4</b>	<b>9.7</b>	<b>5.8</b>

<sup>A</sup> Abbreviations:

Total PM: filterable and condensable particulate matter

PM<sub>10</sub>: particulate matter with an aerodynamic diameter less than or equal to 10 microns ( $\leq 10 \mu\text{m}$ ) including PM<sub>2.5</sub>

PM<sub>2.5</sub>: particulate matter with an aerodynamic diameter less than or equal to 2.5 microns ( $\leq 2.5 \mu\text{m}$ )

SO<sub>2</sub>: sulfur dioxide

NO<sub>x</sub>: oxides of nitrogen

CO: carbon monoxide

VOCs: volatile organic compounds

HAPs: hazardous air pollutants as defined in Section 112(b) of the Clean Air Act

<sup>B</sup> Includes fugitive emissions from venting and blowdowns.

As shown in Table 2, the facility wide PTE is below 100 tons per year (tpy) for all criteria air pollutants, below 10 tpy for any single hazardous air pollutant (HAP), and below 25 tpy for the combined HAP emissions. Detailed calculations have been provided in the permit application received on October 5, 2023. The Department has reviewed these calculations and believes they accurately represent the proposed facility operations.

The facility PTE is based on enforceable emissions restrictions put in place on the three natural gas compressor engines limiting the allowable amount of CO emissions. These restrictions mean the facility will be a synthetic minor source of air pollution, as the emissions are limited to below major source thresholds for the Title V permit to operate program.

DRAFT

**Rules Analysis****Potentially Applicable Rules and Expected Compliance Status**

## A. NDAC 33.1-15-01 – General Provisions:

Multiple topics are included in the General Provisions chapter: entry onto premises - authority, variances, circumvention, severability, land use plans and zoning regulations (only to provide air quality information), measurement of air contaminants, shutdown and malfunction of an installation - requirements for notification, time schedule for compliance, prohibition of air pollution, confidentiality of records, enforcement, and compliance certifications.

*Applicability and Expected Compliance*

Based on the review of the information provided, the facility will comply with all applicable sections of this rule.

## B. NDAC 33.1-15-02 – Ambient Air Quality Standards:

The facility must comply with the North Dakota and Federal Ambient Air Quality Standards (AAQS). In addition to these standards, compliance with the “Criteria Pollutant Modeling Requirements for a Permit to Construct” guidelines<sup>1</sup>.

*Applicability and Expected Compliance*

The facility is not subject to PSD nor does the facility’s PTE trigger the modeling thresholds listed in the “Criteria Pollutant Modeling Requirements for a Permit to Construct”, therefore, preconstruction modeling for this facility was not required. Based on the facility PTE and proposed stack heights, compliance with the ambient air quality standards is expected to be maintained.

## C. NDAC 33.1-15-03 – Restriction of Emission of Visible Air Contaminants:

This chapter requires all non-flare sources from new facilities to comply with an opacity limit of 20% except for one six-minute period per hour when 40% opacity is permissible. This chapter also requires facility flares to comply with an opacity limit of 20% except for one six-minute period per hour when 60% opacity is permissible. Lastly, this chapter restricts opacity of fugitive emissions transported off property to 40% except for one six-minute period per hour when 60% opacity is permissible. This chapter also contains exceptions under certain circumstances and provides the method of measurement to determine compliance with the referenced limits.

*Applicability and Expected Compliance*

---

<sup>1</sup> See October 6, 2014, Criteria Pollutant Modeling Requirements for a Permit to Construct. Available at: [https://www.deq.nd.gov/publications/AQ/policy/Modeling/Criteria\\_Modeling\\_Memo.pdf](https://www.deq.nd.gov/publications/AQ/policy/Modeling/Criteria_Modeling_Memo.pdf)

In lieu of this chapters flare standards, the Department is requiring that the flare (EU FL-1) comply with the requirements in 40 CFR §60.18(c) through (f). See Condition 2.D of ACP-18220 v1.0.

Engines (EUs C-1, C-2, & C-3) will be fired on natural gas (or equivalent) and will undergo routine maintenance; therefore, the units are expected to operate well below the 20% limit stated in the rule.

D. NDAC 33.1-15-04 – Open Burning:

No person may dispose of refuse and other combustible material by open burning, or cause, allow, or permit open burning of refuse and other combustible material, except as provided for in Section 33.1-15-04-02 or 33.1-15-10-02, and no person may conduct, cause, or permit the conduct of a salvage operation by open burning.

Applicability and Expected Compliance

The facility is subject to this chapter and will comply with all open burning regulations.

E. NDAC 33.1-15-05 – Emissions of Particulates Matter Restricted:

This chapter establishes particulate matter emission limits for industrial process equipment and fuel burning equipment used for indirect heating.

Applicability and Expected Compliance

The facility will not emit any particulate matter which results from industrial process equipment, nor will the facility operate any fuel burning equipment used for indirect heating.

F. NDAC 33.1-15-06 – Emissions of Sulfur Compounds Restricted:

This chapter applies to any installation in which fuel is burned and the SO<sub>2</sub> emissions are substantially due to the sulfur content of the fuel; and in which the fuel is burned primarily to produce heat. This chapter is not applicable to installations which are subject to an SO<sub>2</sub> emission limit under Chapter 33.1-15-12, Standards for Performance for New Stationary Sources, or installations which burn pipeline quality natural gas.

Applicability and Expected Compliance

The facility is exempt from this chapter since each engine (EUs C-1, C-2, & C-3) will be fired on gas containing no more than 2 grains of sulfur per 100 standard cubic feet.

G. NDAC 33.1-15-07 – Control of Organic Compounds Emissions:

This chapter establishes requirements for organic compound facilities and the disposal of organic compounds.

Applicability and Expected Compliance

For leak detection and repair of equipment in VOC service (EU FUG), the facility will comply with the applicable requirements under New Source Performance Standard (NSPS) Subpart OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022. The facility will also comply with the pumps and compressors provision by installing and maintaining appropriate seals for their service and operating conditions.

For the facility flare, the facility will comply with this chapter by equipping and operating an automatic igniter or a continuous burning pilot. Additionally, the flare will control organic compounds generated from the VOC storage tanks and produced water tank resulting from process operations.

- H. NDAC 33.1-15-08 – Control of Air Pollution from Vehicles and Other Internal Combustion Engines:

This chapter restricts the operation of internal combustion engines which emit from any source unreasonable and excessive smoke, obnoxious or noxious gas, fumes or vapor. This chapter also prohibits the removal or disabling of motor vehicle pollution control devices.

Applicability and Expected Compliance

The engines (EUs C-1, C-2, & C-3) are also subject to opacity requirements under NDAC 33.1-15-03-02 and subject to the requirements of NSPS Subpart JJJJ. As a result of expected compliance with these provisions, the engines are not expected to emit any unreasonable and excessive smoke, obnoxious or noxious gases, fumes, or vapor.

- I. NDAC 33.1-15-09 – [repealed]
- J. NDAC 33.1-15-10 – Control of Pesticides:

This chapter provides restrictions on pesticide use and restrictions on the disposal of surplus pesticides and empty pesticide containers.

Applicability and Expected Compliance

The facility is subject to this chapter and is expected to comply with all applicable requirements should pesticides be used.

- K. NDAC 33.1-15-11 – Prevention of Air Pollution Emergency Episodes:

When an air pollution emergency episode is declared by the Department, the facility shall comply with the requirements in Chapter 33.1-15-11 of the North Dakota Air Pollution Control (NDAPC) rules.

- L. NDAC 33.1-15-12 – Standards of Performance for New Stationary Sources [40 Code of Federal Regulations Part 60 (40 CFR Part 60)]:

This chapter adopts most of the Standards of Performance for New Stationary Sources (NSPS) under 40 CFR Part 60. The Boulder Compressor Station is subject to the following subparts under 40 CFR Part 60 which have been adopted by North Dakota:

Subpart A – General Provisions

Subpart A contains general requirements for plan reviews, notification, recordkeeping, performance tests, reporting, monitoring and general control device requirements.

Applicability and Expected Compliance

The facility will comply with the general provisions of Subpart A through submission of timely notifications, performance testing, reporting, and following the general control device and work practice requirements under Subpart A. In addition, any changes to the facility after it is built will be evaluated with respect to this subpart as well as others.

Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

Subpart JJJJ establishes emissions standards (NO<sub>x</sub>, CO, VOC) and compliance schedules for all new, modified and reconstructed stationary spark ignition (SI) internal combustion engines (ICE) manufactured on or after July 1, 2007, regardless of size. SI ICE are categorized in this subpart by usage, size and fuel type.

Applicability and Expected Compliance

The natural gas compressor engines (EUs C-1, C-2, & C-3) are subject to the requirements of NSPS Subpart JJJJ. The facility engines are each rated at 2,500 horsepower (hp), were manufactured in 2023, and will be equipped with non-selective catalytic reduction (NSCR) control. Control efficiencies of 75% for CO, 52% for VOC, and 50% for formaldehyde were applied to each engine.

Subpart JJJJ requires each engine to comply with the following emissions standards:

- NO<sub>x</sub> of 1.0 g/hp-hr or 82 ppmvd @ 15% O<sub>2</sub>
- CO of 2.0 g/hp-hr or 270 ppmvd @ 15% O<sub>2</sub>
- VOC of 0.7 g/hp-hr or 60 ppmvd @ 15% O<sub>2</sub>

Beyond the Subpart JJJJ limits, the facility is restricted to lower engine emissions limits to avoid major source thresholds under Title V. As a result, Condition 3 of ACP-18220 v1.0 established the following limits:

- CO of 1.13 g/hp-hr

To demonstrate compliance with the above limits, the facility must conduct emissions testing every 8,760 hours of operations or every three years, whichever comes first.

The facility is also expected to comply with Subpart JJJJ requirements by properly maintaining and operating an air-to-fuel ratio controller and keeping a maintenance plan and records of conducted maintenance and, to the extent practicable, will maintain and operate the engines in a manner consistent with good air pollution control for minimizing emissions.

Subpart OOOOb – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After December 6, 2022

Subpart OOOOb establishes emission standards and compliance schedules for the control of the pollutant greenhouse gases (GHG). The greenhouse gas standard in this subpart is in the form of a limitation on emissions of methane from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after December 6, 2022. This subpart also establishes emission standards and compliance schedules for the control of volatile organic compounds (VOC) and sulfur dioxide (SO<sub>2</sub>) emissions from affected facilities in the crude oil and natural gas source category that commence construction, modification, or reconstruction after December 6, 2022.

Applicability and Expected Compliance

The facility compressors, fugitive emissions (EU FUG), and storage vessels (EUs TK-1 through TK-3, & WTK-1) are subject to the requirements of Subpart OOOOb.

The compressors driven by the natural gas compressor engines (EUs C-1, C-2, & C-3) are considered affected facilities under Subpart OOOOb. The compressors are expected to comply with the applicable standards for reciprocating compressors under Subpart OOOOb.

The fugitive emissions (EU FUG) components that have a potential to emit VOCs are considered affected facilities under Subpart OOOOb. The facility is expected to comply with the applicable fugitive emissions VOC standards through development and implementation of a leak detection and repair (LDAR) program in compliance with Subpart OOOOb requirements. The LDAR program, at a minimum, shall require monitoring, reporting, and recordkeeping.

The storage vessels (EUs TK-1 through TK-3, & WTK-1) meet the definition for applicability under Subpart OOOOb. The vessels will be manifolded together with piping to gather overhead vapors, and the vapors collected will be routed to the facility flare (EU FL-1) which reduces VOCs by at least 95%. The storage vessels are expected to comply with the applicable standards under Subpart OOOOb.

- M. NDAC 33.1-15-13 – Emission Standards for Hazardous Air Pollutants [40 Code of Federal Regulations Part 61 (40 CFR Part 61)]:

This chapter adopts most of the National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR Part 61.

Applicability and Expected Compliance

The facility does not appear to have any applicable requirements under this chapter.

- N. NDAC 33.1-15-14 – Designated Air Contaminant Sources, Permit to Construct, Minor Source Permit to Operate, Title V Permit to Operate:

This chapter requires the facility to obtain a Permit to Construct and a Permit to Operate.

Applicability and Expected Compliance

The facility has submitted an application for a permit to construct and has met all requirements necessary to obtain a permit to construct. The facility will be considered a synthetic minor source via federally enforceable restrictions limiting the CO PTE below 100 tons per year.

The permit must undergo public comment per NDAC 33.1-15-14-06.5.a.

Once the facility completes construction and meets the permit to construct requirements, a facility inspection will be performed by the Department. Pending a satisfactory facility inspection, the facility will be issued a permit to operate by the Department.

- O. NDAC 33.1-15-15 – Prevention of Significant Deterioration of Air Quality [40 CFR 52.21]:

This chapter adopts the federal provisions of the prevention of significant deterioration of air quality (PSD) program. A facility is subject to PSD review if it is classified as a “major stationary source” under Chapter 33.1-15-15.

Applicability and Expected Compliance

This facility is not classified as a “major stationary source” under 40 CFR 52.21(b)(1)(i)(a) and is therefore only subject to PSD review if emissions of a regulated new source review (NSR) pollutant<sup>2</sup> exceed 250 tpy (excluding fugitive emissions). The PTE for this facility, as shown in Table 2, is below the 250 tpy threshold and therefore not subject to PSD review.

- P. NDAC 33.1-15-16 – Restriction of Odorous Air Contaminants:

This chapter restricts the discharge of objectionable odorous air contaminants which measures seven odor concentration units or greater outside the property boundary.

Applicability and Expected Compliance

Based on Department experience with sources having similar emission units, processes, and low hydrogen sulfide concentrations, the facility is expected to comply with this chapter.

---

<sup>2</sup> See 40 CFR 52.21(b)(50). Available at: [https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-52/subpart-A/section-52.21#p-52.21\(b\)\(50\)](https://www.ecfr.gov/current/title-40/chapter-I/subchapter-C/part-52/subpart-A/section-52.21#p-52.21(b)(50))

Q. NDAC 33.1-15-17 – Restriction of Fugitive Emissions:

This Chapter restricts fugitive emissions from particulate matter or other visible air contaminants and gaseous emissions that would violate Chapter 2 (ambient air quality standards), Chapter 15 (PSD), Chapter 16 (odor), or Chapter 19 (visibility).

Applicability and Expected Compliance

The facility will be required to take reasonable precautions to prevent fugitive emissions in violation of the above referenced NDAC chapters.

R. NDAC 33.1-15-18 – Stack Heights:

This chapter restricts the use of stack heights above good engineering practices (GEP). This chapter also restricts the use of dispersion techniques to affect the concentration of a pollutant in the ambient air.

Applicability and Expected Compliance

The stack height of the new engines (EUs C-1, C-2, & C-3) shall be at least 1.5 times the nearby building height. A nearby building is any building located a distance of less than five times the building height from the stack.

S. NDAC 33.1-15-19 – Visibility Protection:

This chapter applies to new major stationary sources as defined in Section 33.1-15-15-01.

Applicability and Expected Compliance

The facility is not a new major stationary source and therefore is not subject to the requirements of this chapter. Given the minor source levels of the visibility impairing air pollutants, such as NO<sub>x</sub>, SO<sub>2</sub>, and PM<sub>2.5</sub>, it is expected that the facility will not adversely contribute to visibility impairment within the three units of the Theodore Roosevelt National Park (nearest federal Class I areas) or at the Lostwood National Wildlife Refuge.

T. NDAC 33.1-15-20 – Control of Emissions from Oil and Gas Well Production Facilities:

The facility is not an oil or gas well facility and is therefore not subject to the requirements of this chapter.

U. NDAC 33.1-15-21 – Acid Rain Program:

This chapter adopts the acid rain provisions of the Clean Air Act specified under 40 CFR Parts 72-78. The facility is not subject to the acid rain provision as they are not an electric utility.

V. NDAC 33.1-15-22 – Emissions Standards for Hazardous Air Pollutants for Source Categories [40 Code of Federal Regulations Part 63 (40 CFR Part 63)]:

This chapter adopts the 40 CFR Part 63 regulations which regulates hazardous air pollutants (HAPs) from regulated source categories. Typically, these standards apply to major sources of air pollution that are a regulated source category. In addition to the major source requirements, some of the regulations have “area source” standards (for non-major sources). Some of the area source standards have not been adopted by the Department and compliance will be determined by the United States Environmental Protection Agency (USEPA) (i.e. 40 CFR 63, Subpart ZZZZ area source provisions have not been adopted by the Department).

Applicability

The facility’s potential HAP emissions are less than 10 tons/year of any single HAP and are less than 25 tons/year of any combination of HAPs, so the facility is an area (minor) source of HAPs. As shown in the Table 2, total potential HAPs from the facility are approximately 9.7 tons/year. The greatest single potential HAP is formaldehyde at less than 6 tons/year.

Subpart A – General Provisions

Subpart A contains general requirements for prohibited activities and circumvention, preconstruction review and notification, standards and maintenance requirements, performance tests, monitoring, recordkeeping, reporting, and control device work practice requirements.

Applicability and Expected Compliance

The facility will comply with the general provisions of Subpart A through submission of timely notifications, performance testing, monitoring, recordkeeping, reporting, and following the control device work practice requirements under Subpart A.

Subpart ZZZZ – National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Applicability and Expected Compliance

The facility has engines (EUs C-1, C-2, & C-3) subject to the requirements under this subpart. The requirements of Subpart ZZZZ for the engines are met by complying with the requirements of NDAC 33.1-15-12 [40 CFR 60]Subpart JJJJ.

W. NDAC 33.1-15-23 – Fees:

This chapter requires a filing fee of \$325 for permit to construct applications, plus any additional fees based on actual processing costs. The additional fees based on processing costs will be assessed upon issuance of the draft permit to construct. The annual operating permit fee is also applicable.

The applicant has paid the \$325 filing fee and may be required to pay the additional fees associated with the permit processing.

X. NDAC 33.1-15-24 – Standards for Lead-Based Paint Activities:

The facility will not perform any lead-based painting and is therefore not subject to this chapter.

Y. NDAC 33.1-15-25 – Regional Haze Requirements:

This chapter is specific to existing stationary sources or groups of sources which have the potential to “contribute to visibility impairment” as defined in Section 33.1-15-25-01.2. Existing stationary sources or groups of sources determined to contribute to visibility impairment may be required to implement emissions reduction measures to help the Department make reasonable progress toward North Dakota’s reasonable progress goals established in accordance with 40 CFR 51.308.

Applicability and Expected Compliance

The facility is a new source and based on low PTE of visibility impairment pollutants is not expected to contribute to visibility impairment. Therefore, the facility is not subject to the requirements of this chapter.

**Summary:**

A complete review of the proposed project indicates that the facility is expected to comply with the applicable federal and state air pollution rules and regulations. The Department will make a final recommendation on the issuance of a Permit to Construct for the Boulder Compressor Station following completion of a 30-day public comment period. The public comment period will run from March 8, 2024, through April 7, 2024.

Update post comment period:  
[Reserved]

**Date of Draft Analysis:** March 8, 2024

**Date of Final Analysis:** [Reserved]

**Analysis By:**

Raina Cardwell  
Environmental Scientist  
Division of Air Quality

RLC: