

**AIR QUALITY EFFECTS ANALYSIS  
FOR  
PERMIT TO CONSTRUCT  
ACP-18145 v1.2**

**Applicant:**

Hiland Partners Holdings LLC  
1001 Louisiana Street, Suite 1000  
Houston, TX 77002

**Facility Location:**

4Runner Compressor Station  
Williams County, North Dakota  
48.056636, -103.393164  
SE ¼, Sec. 22, T153N, R99W

**Introduction:**

On August 11, 2022, Hiland Partners Holdings LLC (Hiland Partners) submitted a permit revision application to the Department requesting a name change for the Four Runner Compressor Station and changes to the engine specifications. In response, Air Permit to Construct ACP-18145 v1.1 (incorrectly labeled ACP-18145 v2.0) was issued by the Department of Environmental Quality – Division of Air Quality (Department) on September 9, 2022 for the 4Runner Compressor Station and the facility began operation in early 2023. After being inspected in July 2023, an Air Permit to Operate was drafted. During the drafting process, the Department determined that a revised Air Permit to Construct was required. The station is used to compress field natural gas for pipeline transmission. The station is located approximately fifteen miles southeast of Williston, North Dakota, in Williams County.

***Table 1 – Emission units associated with the 4Runner Compressor Station***

| <b>Emission Unit Description</b>   | <b>Emission Unit (EU)</b> | <b>Emission Point (EP)</b> | <b>Air Pollution Control Equipment</b>   |
|--|---------------------------|----------------------------|--|
| Waukesha L7044GSI Series 5 (4SRB) natural gas-fired compressor engine rated at 1,900 bhp manufactured December 2021 (NSPS JJJJ, OOOOa) (MACT ZZZZ) | C1                        | C1                         | Non-Selective Catalytic Reduction (NSCR) |
| Waukesha L7044GSI Series 4 (4SRB) natural gas-fired compressor engine rated at 1,680 bhp manufactured February 2012 (NSPS JJJJ, OOOOa) (MACT ZZZZ) | C2                        | C2                         | NSCR                                     |

| <b>Emission Unit Description</b>   | <b>Emission Unit (EU)</b> | <b>Emission Point (EP)</b> | <b>Air Pollution Control Equipment</b> |
|--|---------------------------|----------------------------|--|
| Waukesha L7044GSI Series 4 (4SRB) natural gas-fired compressor engine rated at 1,680 bhp manufactured February 2019 (NSPS JJJJ, OOOOa) (MACT ZZZZ) | C3                        | C3                         | NSCR                                   |
| Caterpillar G3606 (4SLB) natural gas-fired compressor engine rated at 1,875 bhp manufactured November 2019 (NSPS JJJJ, OOOOa) (MACT ZZZZ)          | C4                        | C4                         | Catalytic Oxidation                    |
| Caterpillar G3606 (4SLB) natural gas-fired compressor engine rated at 1,875 bhp manufactured November 2019 (NSPS JJJJ, OOOOa) (MACT ZZZZ)          | C5                        | C5                         | Catalytic Oxidation                    |
| Waukesha L7044GSI Series 5 (4SRB) natural gas-fired compressor engine rated at 1,900 bhp manufactured December 2021 (NSPS JJJJ, OOOOa) (MACT ZZZZ) | C6                        | C6                         | NSCR                                   |
| TEG regenerator reboiler rated at $1.5 \times 10^6$ Btu/hr   | 7                         | 7                          | BTEX Condenser & TEG Reboiler          |
| Triethylene glycol (TEG) dehydration unit rated at $60 \times 10^6$ scfd (MACT HH)   | 8                         | 7, 9, & 10 <sup>A</sup>    | None                                   |
| Two 400-bbl produced water tanks (atmospheric)   | 9 & 10                    | 9 & 10                     | Submerged Fill Pipes (SFP)             |
| Compressor engine and equipment blowdowns  | BD <sup>B</sup>           | BD                         | None                                   |
| Fugitive emissions   | FUG                       | FUG                        | Leak Detection and Repair (LDAR)       |
| Pigging <sup>C</sup>   | -                         | -                          | -                                      |
| Produced water truck loading <sup>C</sup>  | -                         | -                          | -                                      |
| Three methanol storage tanks <sup>C</sup>  | -                         | -                          | -                                      |

<sup>A</sup> Emissions from the TEG dehydration unit flash tank are recycled back into the process. Emissions from the regenerator are controlled by a condenser with non-condensable gasses exiting the condenser being combusted in the TEG reboiler firebox and condensed liquids routed to the produced water tanks (EU 9 and EU 10).

<sup>B</sup> Some blowdowns do not go through the gas recycle system and are vented to atmosphere.

<sup>C</sup> Insignificant source of emissions.

**Current/Proposed Engine Emission Limits:**

| <b>Unit</b>           | <b>Current Emission Limit <sup>A, B</sup></b>   | <b>Proposed Emission Limit <sup>A, B</sup></b>   |
|-----------------------|---|--|
| Waukesha engine C1    | NO <sub>x</sub> : 3.52 lb/hr and 0.84 g/hp-hr or 82 ppmvd<br>CO: 3.52 lb/hr and 0.84 g/hp-hr or 270 ppmvd<br>VOC: 2.31 lb/hr and 0.55 g/hp-hr or 60 ppmvd<br>Opacity: 20% | NO <sub>x</sub> : 0.84 g/hp-hr<br>CO: 0.84 g/hp-hr<br>VOC: 0.55 g/hp-hr<br>Opacity: 20%  |
| Waukesha engine C2    | NO <sub>x</sub> : 3.52 lb/hr and 0.95 g/hp-hr or 82 ppmvd<br>CO: 3.52 lb/hr and 0.95 g/hp-hr or 270 ppmvd<br>VOC: 2.37 lb/hr and 0.64 g/hp-hr or 60 ppmvd<br>Opacity: 20% | NO <sub>x</sub> : 0.95 g/hp-hr<br>CO: 0.95 g/hp-hr<br>VOC: 0.64 g/hp-hr<br>Opacity: 20%  |
| Waukesha engine C3    | NO <sub>x</sub> : 3.52 lb/hr and 0.95 g/hp-hr or 82 ppmvd<br>CO: 3.52 lb/hr and 0.95 g/hp-hr or 270 ppmvd<br>VOC: 2.37 lb/hr and 0.64 g/hp-hr or 60 ppmvd<br>Opacity: 20% | NO <sub>x</sub> : 0.95 g/hp-hr<br>CO: 0.95 g/hp-hr<br>VOC: 0.64 g/hp-hr<br>Opacity: 20%  |
| Caterpillar engine C4 | NO <sub>x</sub> : 4.13 lb/hr and 1.0 g/hp-hr or 82 ppmvd<br>CO: 4.13 lb/hr and 1.0 g/hp-hr or 270 ppmvd<br>VOC: 3.10 lb/hr and 0.7 g/hp-hr or 60 ppmvd<br>Opacity: 20%    | NO <sub>x</sub> : 1.0 g/hp-hr or 82 ppmvd at 15% O <sub>2</sub><br>CO: 1.0 g/hp-hr<br>VOC: 0.7 g/hp-hr or 60 ppmvd at 15% O <sub>2</sub><br>Opacity: 20% |
| Caterpillar engine C5 | NO <sub>x</sub> : 4.13 lb/hr and 1.0 g/hp-hr or 82 ppmvd<br>CO: 4.13 lb/hr and 1.0 g/hp-hr or 270 ppmvd<br>VOC: 3.10 lb/hr and 0.7 g/hp-hr or 60 ppmvd<br>Opacity: 20%    | NO <sub>x</sub> : 1.0 g/hp-hr or 82 ppmvd at 15% O <sub>2</sub><br>CO: 1.0 g/hp-hr<br>VOC: 0.7 g/hp-hr or 60 ppmvd at 15% O <sub>2</sub><br>Opacity: 20% |
| Waukesha engine C6    | NO <sub>x</sub> : 3.52 lb/hr and 0.84 g/hp-hr or 82 ppmvd<br>CO: 3.52 lb/hr and 0.84 g/hp-hr or 270 ppmvd<br>VOC: 2.31 lb/hr and 0.55 g/hp-hr or 60 ppmvd<br>Opacity: 20% | NO <sub>x</sub> : 0.84 g/hp-hr<br>CO: 0.84 g/hp-hr<br>VOC: 0.55 g/hp-hr<br>Opacity: 20%  |

<sup>A</sup> C4 and C5's NO<sub>x</sub> and VOC emission limits in g/hp-hr and ppmvd at 15% O<sub>2</sub> are from 40 CFR 60, Subpart JJJJ. The NO<sub>x</sub> and VOC emission limits for C1, C2, C3, and C6, and the CO emission limits for C1 through C6 are more stringent than the Subpart JJJJ NO<sub>x</sub> emission limits of 1.0 g/hp-hr and 82 ppmvd at 15% O<sub>2</sub>, CO emission limits of 2.0 g/hp-hr and 270 ppmvd at 15% O<sub>2</sub>, and VOC emission limits of 0.7 g/hp-hr and 60 ppmvd at 15% O<sub>2</sub>. The permittee must also meet all applicable emission limits established by 40 CFR 63, Subpart ZZZZ.

<sup>B</sup> 40% opacity is permissible for not more than one six-minute period per hour.

**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    | PM <sub>10</sub> | PM <sub>2.5</sub> | Total HAPs  | HAP Name (Largest HAP) |
|---|-----|--------------|-----------------|-----------------|--------------|-------------|------------------|-------------------|-------------|------------------------|
| Waukesha L7044GSI compressor engine       | C1  | 15.41        | 15.41           | 0.04            | 10.09        | 1.33        | 1.33             | 1.33              | 0.43        | Methanol               |
| Waukesha L7044GSI compressor engine       | C2  | 15.41        | 15.41           | 0.04            | 10.38        | 1.32        | 1.32             | 1.32              | 0.42        | Methanol               |
| Waukesha L7042GSI compressor engine       | C3  | 15.41        | 15.41           | 0.04            | 10.38        | 1.32        | 1.32             | 1.32              | 0.42        | Methanol               |
| Caterpillar 3606 A4 compressor engine     | C4  | 18.11        | 18.11           | 0.04            | 12.67        | 0.61        | 0.61             | 0.61              | 2.08        | Formaldehyde           |
| Caterpillar 3606 A4 compressor engine     | C5  | 18.11        | 18.11           | 0.04            | 12.67        | 0.61        | 0.61             | 0.61              | 2.08        | Formaldehyde           |
| Waukesha L7044GSI compressor engine       | C6  | 15.41        | 15.41           | 0.04            | 10.09        | 1.34        | 1.34             | 1.34              | 0.43        | Methanol               |
| TEG regenerator reboiler                  | 7   | 0.37         | 0.44            | 0.00            | 0.02         | 0.03        | 0.03             | 0.03              | 0.01        |                        |
| TEG dehydration unit                      | 8   | ---          | ---             | ---             | 3.41         | ---         | ---              | ---               | 0.66        | Hexane                 |
| 400-bbl produced water tank               | 9   | ---          | ---             | ---             | 1.22         | ---         | ---              | ---               |             |                        |
| 400-bbl produced water tank               | 10  | ---          | ---             | ---             | 1.22         | ---         | ---              | ---               |             |                        |
| Fugitive emissions                        | FUG | ---          | ---             | ---             | 5.40         | ---         | ---              | ---               | 0.05        | Hexane                 |
| Compressor engine and equipment blowdowns | BD  | ---          | ---             | ---             | 17.97        | ---         | ---              | ---               | 0.22        |                        |
| Pigging                                   | N/A | ---          | ---             | ---             | 1.00         | ---         | ---              | ---               |             |                        |
| Truck loading – produced water            | N/A | ---          | ---             | ---             | 0.44         | ---         | ---              | ---               |             |                        |
| Two methanol storage tanks                | N/A | ---          | ---             | ---             | 0.03         | ---         | ---              | ---               | 0.27        |                        |
| <b>Total (without Fugitives):</b>         |     | <b>98.22</b> | <b>98.29</b>    | <b>0.24</b>     | <b>91.60</b> | <b>6.56</b> | <b>6.56</b>      | <b>6.56</b>       | <b>7.02</b> |                        |
| <b>Total (with Fugitives):</b>            |     | <b>98.22</b> | <b>98.29</b>    | <b>0.24</b>     | <b>97.01</b> | <b>6.56</b> | <b>6.56</b>      | <b>6.56</b>       | <b>7.08</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

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 Air Permit to Construct revision application from August 11, 2022. 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 six natural gas compressor engines, limiting the allowable amount of NO<sub>x</sub>, CO, and VOC 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 both the prevention of significant deterioration (PSD) and Title V programs.

**Summary and Recommendations:**

A complete review of the proposed project indicates that the 4Runner Compressor Station 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 modified Permit to Construct for the 4Runner Compressor Station following completion of a 30-day public comment period.

Update post comment period:  
[Reserved]

**Date of Draft Analysis:** February 15, 2024

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

**Analysis By:**

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RSM