

AIR POLLUTION CONTROL  
 MINOR SOURCE  
 PERMIT TO OPERATE

Pursuant to Chapter 23.1-06 of the North Dakota Century Code (NDCC), and the Air Pollution Control Rules of the State of North Dakota (Article 33.1-15 of the North Dakota Administrative Code), and in reliance on statements and representations heretofore made by the permittee designated below, a Permit to Operate is hereby issued authorizing such permittee to operate the source unit(s) at the location designated below. This Permit to Operate is subject to all applicable rules and orders now or hereafter in effect of the North Dakota Department of Environmental Quality (Department) and to any conditions specified below:

<p>1. <b>Permittee:</b></p> <p>A. <b>Name:</b> Arrow Field Services, LLC</p> <p>B. <b>Address:</b> 1300 Main Street Houston, TX 77002</p>	<p>2. A. <b>Permit Number:</b> AOP-28043 v2.0</p> <p>B. <b>Permit Description:</b> Synthetic Minor Source: NDAC 33.1-15-14-03.1.e</p>
<p>3. <b>Source Name &amp; Location:</b> Bear Den Gas Plant Watford City, ND 58854 NW ¼, NE ¼, Sec. 21, T149N, R98W Lat: 47.71603, Long: -103.22660 McKenzie County</p>	<p>4. <b>Source Type:</b> Natural Gas Processing</p>
<p>5. <b>Expiration Date:</b> <span style="float: right;">December 23, 2029</span></p>	

6. **Source Unit(s):**

Emission Unit Description	Emission Unit (EU)	Emission Point (EP)	Air Pollution Control Equipment
Waukesha VHP L7044GSI natural gas-fired engine (4SRB) rated at 1,680 bhp manufactured 2014 (NSPS JJJJ, OOOO) (MACT ZZZZ)	C-1 (C-101)	1	3-way catalyst, [nonselective catalytic reduction (NSCR)]
Waukesha VHP L7044GSI natural gas-fired engine (4SRB) rated at 1,680 bhp manufactured 2014 (NSPS JJJJ, OOOO) (MACT ZZZZ)	C-2 (C-102)	2	3-way catalyst (NSCR)
Waukesha VHP L7044GSI natural gas-fired engine (4SRB) rated at 1,680 bhp manufactured 2014 (NSPS JJJJ, OOOO) (MACT ZZZZ)	C-3 (C-103)	3	3-way catalyst (NSCR)

<b>Emission Unit Description</b>	<b>Emission Unit (EU)</b>	<b>Emission Point (EP)</b>	<b>Air Pollution Control Equipment</b>
Waukesha VHP L7044GSI natural gas-fired engine (4SRB) rated at 1,680 bhp manufactured 2014 (NSPS JJJJ, OOOO) (MACT ZZZZ)	C-4 (C-201)	4	3-way catalyst (NSCR)
Waukesha VHP L7044GSI natural gas-fired engine (4SRB) rated at 1,680 bhp manufactured 2014 (NSPS JJJJ, OOOO) (MACT ZZZZ)	C-5 (C-202)	5	3-way catalyst (NSCR)
30 x 10 <sup>6</sup> scfd ethylene glycol dehydration unit (still vent)	EG1	6	None
Ethylene glycol flash tank	TK-EG	18	Flare (EU FL3)
Natural gas-fired hot oil heater rated at approximately 5.9 x 10 <sup>6</sup> Btu/hr	H1 (H-0720)	8	None
Natural gas-fired heat medium heater rated at approximately 18 x 10 <sup>6</sup> Btu/hr (NSPS Dc)	H2 (H-21610)	15	None
Natural gas-fired hot oil heater rated at approximately 48.7 x 10 <sup>6</sup> Btu/hr (NSPS Dc)	H3 (H-21660)	16	None
Natural gas-fired regen gas heater rated at approximately 4.63 x 10 <sup>6</sup> Btu/hr	H4 (HT-750)	17	None
Three 500-bbl condensate storage tanks (NSPS Kb)	TK-CO1, TK-CO2, TK-CO3	N/A	Submerged Fill Pipe (SFP) & Vapor Recover Unit (VRU)
Two 500-bbl slop storage tanks (NSPS Kb)	TK-SLOP1, TK-SLOP2	N/A	SFP & VRU
Two 500-bbl produced water tanks	TK-WT1 <sup>A</sup> , TK-WT2 <sup>A</sup>	13	SFP
Two 400-bbl methanol storage tanks	TK-METH1 <sup>A</sup> , TK-METH2 <sup>A</sup>	14	SFP
Eight 90,000-gallon NGL bullet tanks	TK-NGL <sup>A</sup>	N/A	None
NGL truck loading	L1	11	None
Slop truck loading	L2	12	None
Condensate truck loading	L3	10	Enclosed combustor (EU FL2)
Produced water truck loading	L4	12	None
Enclosed combustor for truck loading	FL2	10	None
Cryo flare	FL3	18	None
Process fugitive emissions (NSPS OOOOa)	FUG	FUG	Leak Detection & Repair (LDAR) Program
Six electric-driven compressors (NSPS OOOOa)	EC-1 through EC-6 <sup>A</sup>	EC-1 through EC-6	NSPS OOOOa

<sup>A</sup> Insignificant or fugitive emission sources (no specific emission limit).

CONDITIONS

7. A. **Emission Limits:** Emission limits from the operation of the source unit(s) identified in Item 6 of this Permit to Operate (hereafter referred to as “permit”) are as follows. Source units not listed are subject to the applicable emission limits specified in the North Dakota Air Pollution Control Rules.

Emission Unit Description	EU	EP	Pollutant/Parameter	Emission Limit / Work Practice <sup>A</sup>
Five natural gas-fired engines	C-1 through C-5	1 through 5	NO <sub>x</sub>	0.5 g/hp-hr <sup>B</sup>
			CO	0.5 g/hp-hr <sup>B</sup>
			VOC	0.7 g/hp-hr or 60 ppmvd
			Opacity	20% <sup>C</sup>
Hot oil heater	H1	8	Opacity	20% <sup>C</sup>
Heat medium heater	H2	15	Opacity	20% <sup>C</sup>
Hot oil heater	H3	16	Opacity	20% <sup>C</sup>
Regen gas heater	H4	17	Opacity	20% <sup>C</sup>
Enclosed combustor	FL2	10	Opacity	20% <sup>D</sup>
Cryo flare	FL3	18	Opacity	20% <sup>D</sup>

<sup>A</sup> Emission limits apply to each emission point.

<sup>B</sup> Less restrictive 40 CFR 60 Subpart JJJJ limits also apply.

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

<sup>D</sup> 60% opacity is permissible for not more than one six-minute period per hour.

- B. **Fuel Restriction:** The fuel gas combustion devices (EUs C1 through C5, H1, H2, H3, H4, FL2, and FL3) are restricted to combusting only pipeline quality natural gas containing no more than 2 grains of sulfur per 100 standard cubic feet or commercial propane as defined by the Gas Processors Association.
- C. **Best Management Practices:** At all times, including periods of startup, shutdown, and malfunction, the permittee shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.
- D. **Storage Tanks:** EUs TK-CO1, TK-CO2, TK-CO3, TK-SLOP1, TK-SLOP2, TK-METH1, TK-METH2, TK-WT1, and TK-WT2 shall be equipped with a submerged fill pipe in accordance with NDAC 33.1-15-07-01.3
- E. **Loading Operations:** The slop truck loadout (EU L2), the condensate truck loadout (EU L3), and the produced water truck loadout (EU L4) shall be operated with a submerged filling arm.

F. **Flare and Combustor Restrictions:**

- 1) When it is necessary to operate the combustor (EU FL2) and the flare (EU FL3) during emergency, malfunction or maintenance, all precautions shall be taken to minimize emissions and maintain compliance with the applicable ambient air quality standards as outlined in NDAC 33.1-15-02 and the opacity standard of 20% visible emissions, except for periods of 60% opacity is permissible for not more than one six-minute period per hour.
- 2) The combustor (EU FL2) and flare (EU FL3) must be equipped and operated with an automatic ignitor or a continuous burning pilot which must be maintained in good working order as outlined in NDAC 33.1-15-07-02.
- 3) The presence of a flame shall be monitored using a thermocouple or any other equivalent device approved by the Department.

G. **Stack Heights:** Emissions shall be vented through stacks that meet the following requirements:

<b>Emission Point Number</b>	<b>Minimum Stack Height (feet)</b>
C-1	49.5
C-2	49.5
C-3	49.5
C-4	49.5
C-5	49.5

H. **New Source Performance Standards (NSPS):** The permittee shall comply with all applicable requirements of the following NSPS subparts as referenced in Chapter 33.1-15-12 of the North Dakota Air Pollution Control Rules and 40 CFR 60.

- 1) 40 CFR 60, Subpart Dc - Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units (EUs H2 and H3).
- 2) 40 CFR 60, Subpart Kb - Standards of Performance for Volatile Organic Liquid Storage Vessels (including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction or Modification Commenced after July 23, 1984 (EUs TK-CO1, TK-CO2, TK-CO3, TK-SLOP1, and TK-SLOP2).
- 3) 40 CFR 60, Subpart JJJJ - Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (EUs C1 through C5).
- 4) 40 CFR 60, Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After August 23, 2011 and On or Before September 18, 2015 (compressors driven by EUs C1 through C5).

- 5) 40 CFR 60, Subpart OOOOa - Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced after September 18, 2015 [six compressors (EC-1 through EC-6) driven by electric motors and EU FUG].

I. **Maximum Achievable Control Technology Standards (MACT):** The permittee shall comply with all applicable requirements of the following MACT subparts as referenced in Chapter 33.1-15-22 of the North Dakota Air Pollution Control Rules and 40 CFR 63.

- 1) 40 CFR 63, Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (EUs C1 through C5). As an area source of HAP emissions, compliance with 40 CFR 60, Subpart JJJJ constitutes compliance with 40 CFR 63, Subpart ZZZZ for EUs C1 through C5. The North Dakota Department of Environmental Quality has not adopted the area source provisions of this subpart. Please send all documentation to EPA at the following address:

U.S. EPA Region 8  
1595 Wynkoop Street  
Mail Code 8ENF-AT  
Denver, CO 80202-1129

J. **Organic Compounds Emissions:** The permittee shall comply with the applicable requirements of NDAC 33.1-15-07, Control of Organic Compounds Emissions.

K. **Fugitive Emissions:** The release of fugitive emissions shall comply with the applicable requirements in NDAC 33.1-15-17.

L. **Annual Emission Inventory/Annual Production Reports:** The permittee shall submit an annual emission inventory report and/or an annual production report upon Department request, on forms supplied or approved by the Department.

M. **Source Operations:** Operations at the facility shall be in accordance with statements, representations, procedures and supporting data contained in the initial application, and any supplemental information or renewal application(s) submitted thereafter. Any operations not listed in this permit are subject to all applicable North Dakota Air Pollution Control Rules.

N. **Alterations, Modifications or Changes:** Any alteration, repairing, expansion, or change in the method of operation of the source which results in the emission of an additional type or greater amount of air contaminants or which results in an increase in the ambient concentration of any air contaminant, must be reviewed and approved by the Department prior to the start of such alteration, repairing, expansion or change in the method of operation.

- O. **Recordkeeping:** The permittee shall maintain any compliance monitoring records required by this permit or applicable requirements. The permittee shall retain records of all required monitoring data and support information for a period of at least five years from the date of the monitoring sample, measurement, report or application. Support information may include all calibration and maintenance records and all original strip-chart recordings/computer printouts for continuous monitoring instrumentation, and copies of all reports required by the permit.
- P. **Air Pollution from Internal Combustion Engines:** The permittee shall comply with all applicable requirements of NDAC 33.1-15-08-01 – Internal Combustion Engine Emissions Restricted.
- Q. **Nuisance or Danger:** This permit shall in no way authorize the maintenance of a nuisance or a danger to public health or safety.
- R. **Malfunction Notification:** The permittee shall notify the Department as soon as possible during normal working hours of any malfunction which can be expected to last longer than twenty-four hours and can cause the emission of air contaminants in violation of applicable rules and regulations. Immediate notification to the Department is required for any malfunction that would threaten health or welfare or pose an imminent danger.
- S. **Operation of Air Pollution Control Equipment:** The permittee shall maintain and operate all air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions.
- T. **Permit Renewal and Invalidation:** This permit shall be effective from the date of its issuance until the date specified in Item 5 unless sooner suspended, revoked or surrendered. Upon suspension or revocation, the permit shall be returned to the Department. Application for renewal of this permit shall be submitted ninety days prior to such expiration date. The Department shall approve or disapprove the renewal of the permit within ninety days of receipt of the renewal application.
- U. **Change of Ownership:** This permit may not be transferred without prior approval from the Department.
- V. **Right of Entry:** Any duly authorized officer, employee or agent of the North Dakota Department of Environmental Quality may enter and inspect any property, premise or place at which the source listed in Item 3 of this permit is located at any time for the purpose of ascertaining the state of compliance with the North Dakota Air Pollution Control Rules. The Department may conduct tests and take samples of air contaminants, fuel, processing material, and other materials which affect or may affect emissions of air contaminants from any source. The Department shall have the right to access and copy any records required by the Department's rules and to inspect monitoring equipment located on the premises.

- W. **Other Regulations:** The permittee of the source unit(s) described in Item 6 of this permit shall comply with all State and Federal environmental laws and rules. In addition, the permittee shall comply with all local burning, fire, zoning, and other applicable ordinances, codes, rules and regulations.
- X. **Permit Issuance:** This permit is issued in reliance upon the accuracy and completeness of the information set forth in the application. The conditions of this permit herein become, upon the effective date of this permit, enforceable by the Department pursuant to any remedies it now has, or may in the future have, under the North Dakota Air Pollution Control Law, NDCC Chapter 23.1-06. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- Y. **Odor Restrictions:** The permittee shall not discharge into the ambient air any objectionable odorous air contaminant which is in excess of the limits established in NDAC 33.1-15-16.

The permittee shall not discharge into the ambient air hydrogen sulfide (H<sub>2</sub>S) in concentrations that would be objectionable on land owned or leased by the complainant or in areas normally accessed by the general public. For the purpose of complaint resolution, two samples with concentrations greater than 0.05 parts per million (50 parts per billion) sampled at least 15 minutes apart within a two-hour period and measured in accordance with Section 33.1-15-16-04 constitute a violation.

- Z. **Sampling and Testing:** The Department may require the permittee to conduct tests to determine the emission rate of air contaminants from the source. The Department may observe the testing and may specify testing methods to be used. A signed copy of the test results shall be furnished to the Department within 60 days of the test date. The basis for this condition is NDAC 33.1-15-01-12 which is hereby incorporated into this permit by reference. To facilitate preparing for and conducting such tests, and to facilitate reporting the test results to the Department, the permittee shall follow the procedures and formats in the Department's Emission Testing Guideline.

FOR THE NORTH DAKOTA DEPARTMENT  
OF ENVIRONMENTAL QUALITY

Date \_\_\_\_\_

By \_\_\_\_\_  
James L. Semerad  
Director  
Division of Air Quality