FACT SHEET FOR: OP26M2-021 **DATE:**

DWEE ID: 86416

Name of Source: Sandhills Renewable Energy LLC

Source Classification: Class II Synthetic Minor at time of issuance
Area Source of Hazardous Air Pollutants (HAPs)

Regulatory changes may supersede information in this document. If the source should add or change equipment or change processes such that a NESHAP or NSPS subpart becomes an applicable requirement, it is the source's obligation to comply with that subpart and applicable requirements whether or not they are identified in the associated permitting action or Title 129. Also note that the NESHAP and NSPS subparts are subject to change. Detailed information related to NESHAP and NSPS subparts can be found on the DWEE Air Toxics Notebook and DWEE NSPS Notebook located on the DWEE website (https://dwee.nebraska.gov/). The DWEE website can also be used to find other permit related and facility specific information that is not identified in this fact sheet.

DESCRIPTION OF THE SOURCE OR ACTIVITY:

This operating permit OP26M2-021 approves the operation of an ethanol manufacturing facility producing approximately 80,000,000 gallons per year of denatured ethanol by Sandhills Renewable Energy LLC (Sandhills).

PERMIT REVISION:

On May 15, 2026, Sandhills Renewable Energy, LLC submitted a significant operating permit modification application OP26M2-021 to incorporate the applicable requirements of Construction Permit CP25-027 issued March 11, 2026. Construction Permit CP25-027 authorized the addition of fermentation and distillation emission units, increases to the emission limits of acetaldehyde and VOC, reduced the hours of operation for the DDGS dryer and RTO system, and revised the set maximum circulation rate of the cooling towers. The construction permit was also revised to add a new hammermill baghouse (CP25-027 Condition III.(A)), but that action has not yet been completed, and thus will not be covered in this operating permit modification.

TYPE AND QUANTITY OF AIR CONTAMINANT EMISSIONS ANTICIPATED:

The change in emissions for this project is shown in the potential to emit (PTE) table below {pollutants in the facility not listed below did not have any change in PTE}:

Regulated Pollutant	Potential Emissions[1] (tons/year)	Potential Emissions after Revision (tons/year)	Change in Potential Emissions[2] (tons/year)
Particulate Matter (PM)	64.52	65.61	1.09
Particulate Matter less than or equal to 10 microns (PM_{10})	38.89	30.12	-8.77
Particulate Matter less than or equal to 2.5 microns ($PM_{2.5}$)	28.45	30.12	1.67
Sulfur Dioxide (SO_2)	24.22	9.62	-14.60
Oxides of Nitrogen (NO_x)	84.42	59.42	-25.00
Carbon Monoxide (CO)	72.07	54.90	-17.17
Volatile Organic Compounds (fug and non-fug)	111.01	95.05	-15.96
Hazardous Air Pollutants (HAPs)	15.36	13.29	-2.07

[1] The potential emissions are from the fact sheet associated with Operating Permit OP23R2-035.
[2] The change in potential emissions calculations were provided in the Air Quality Permit Revision Request Form received on May 15, 2026,and subsequent updated information submitted on June 1, 2026; both are located in the DWEE's file for this source.

APPLICABLE REQUIREMENTS AND VARIANCES OR ALTERNATIVES TO REQUIRED STANDARDS:

Title 129, Chapter 9, Section 005 – Significant Permit Revisions

The source requested a significant operating permit revision to its existing operating permit as per Title 129, Chapter 9, Section 005 [1]

> Title 129, Chapter 9, Section 005 A "significant permit revision" is any revision or change to a permit that cannot be accomplished as an administrative permit amendment or as a minor permit revision. Any relaxation in existing monitoring, reporting, or recordkeeping shall be considered significant.
>
> Title 129, Chapter 9, Section 005.01 A source may request a significant permit revision by submitting the application forms and information in accordance with Chapter 6, Section 002 for operating permit revisions or Chapter 3, Section 001.05, for construction permit revisions.
>
> Title 129, Chapter 9, 005.03 For operating permits only, the permit shield described in Chapter 6, Section 003.12, shall apply to a significant permit revision only after the Director approves the permit revision, provided that the permit contains a permit shield.

[1] Section 005.02 is not included because it contains instructions for the DWEE.

Sandhills Renewable Energy, LLC complied with all the above applicable requirements when submitting their application for the significant operating permit revision.

SUPPLEMENTAL INFORMATION:

Title 129, Chapter 12 - New Source Performance Standards (NSPS) and Emission Limits for Existing Sources

Subpart A – General Provisions*:*

This subpart applies to those units subject to another NSPS subpart. This subpart currently applies to Sandhills Renewable because the emission units at the source are subject to the requirements of another NSPS standard.

Subpart Dc – Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units:

This subpart is for steam generating units with a design rate between 10 MMBtu/hr and 100 MMBtu/hr, installed after June 9, 1989. Both boilers being constructed at the facility are subject to this subpart since each unit has a heat input rating of 92.4 MMBtu/hr. EPA has determined that a thermal oxidizer with a waste heat boiler is considered a steam generating unit, per EPA's January 8, 2003, memorandum from Michael S. Alushin, Director of the Compliance Assessment and Media Programs Division of the Office of Compliance to George T. Czerniak, Chief of the Air Enforcement and Compliance Assurance Branch of USEPA Region 5's Air and Radiation Division, concerning applicability of NSPS, Subpart Db to a thermal oxidizer/waste heat-recovery boiler at an ethanol production facility. Since the regenerative thermal oxidizer being constructed does not have a waste heat recovery boiler, this subpart does not apply to the RTO.

Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels:

This subpart applies to storage vessels with a capacity greater than or equal to 75 cubic meters (m^3), 19,800 gallons, that is used to store volatile organic liquids for which construction, reconstruction, or modification was commenced after July 23, 1984. Tanks that are used within a process (including a solvent or raw material recovery process) to collect material discharged from a feedstock storage vessel or equipment within the process before the material is transferred to other equipment within the process, to a product or by-product storage vessel, or to a vessel used to store recovered solvent or raw material (i.e. process vessels) are exempt from this subpart. Therefore, the tanks that are used to store Denatured Ethanol (TK-6105, and TK-6106) and Denaturant (TK-6104) are explicitly subject to this subpart. Tanks that contain anhydrous ethanol (TK-6101 and TK-6102) and will be further processed are not considered storage tanks and therefore are not subject to this regulation, but WDEE is using the requirements for inspections and recordkeeping from Subpart Kb to be the HAP state BACT requirements (Title 129, Chapter 13, Section 004).

Subpart VV – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry:

This subpart to the VOC equipment leaks associated with this plant (a Synthetic Organic Chemical Manufacturing Industry). This subpart is associated with subpart NNN & RRR, but NNN & RRR are based on how the chemical is produced (biomass versus synthetic), while VV is based on the chemicals produced. Since new organic chemicals are synthesized (process doesn't matter), then all of the associated equipment leaks are subject to this subpart. Associated equipment includes light liquid valves, light liquid pumps, gas valves, control valves, flanges, transmitters, and manholes.

Subpart IIII – Standards of Performance for Stationary Compression Ignition (IC) Internal Combustion Engines (ICE):

This subpart applies to stationary compression ignition internal combustion engines which commence construction or have been modified or reconstructed after July 11, 2005. The emergency firewater pump at this facility is subject to this subpart.

The following NSPS appear to apply but do not:

Subpart DD – Standards of Performance for Grain Elevators:

This subpart does not apply to the grain handling operations at this facility because this facility only receives and handles dry corn which is not for human consumption and the permanent storage capacity is less than 2.5 million bushels at this source. The permanent storage capacity for the grain handling operations at this plant is 473,614 bushels.

Subpart VVa – Standards of Performance for Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry for Which Construction, Reconstruction, or Modification Commenced after November 7, 2006:

This subpart to the VOC equipment leaks associated at a Synthetic Organic Chemical Manufacturing facility that was constructed, reconstructed, or modified after November 7, 2006. This new subpart includes all the requirements of 40 CFR Part 60, Subpart VV, as amended, along with new provisions. Differences between Subparts VVa and VV include, but are not limited to, lower leak definitions for pumps and valves, requiring monitoring of connectors, and additional recordkeeping requirements and quality assurance measures. If Sandhills Renewable would physically modify its process line in the future, this subpart may become applicable.

Subpart NNN – Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemicals Manufacturing Industry (SOCMI) Distillation Operations:

This subpart does not apply to the distillation operation, per EPA's January 24, 2000, letter from Richard Tripp, EPA Region VII to Randy Griffin, Nebraska Air Quality Compliance Supervisor, concerning applicability of 40 CFR 60 to biomass ethanol production. The letter stated that Subpart NNN does not apply to ethanol derived from biomass. Subpart NNN applies to synthetic (chemical reaction of petroleum refining products) processes to produce organic chemicals (including ethanol).

Subpart RRR – Standards of Performance for Volatile Organic Compound (VOC) Emissions from Synthetic Organic Chemicals Manufacturing Industry (SOCMI) Reactor Processes:

This subpart does not apply to the fermentation tanks, per EPA's January 24, 2000, letter, from Richard Tripp, EPA Region VII to Randy Griffin, Nebraska Air Quality Compliance Supervisor, concerning applicability of 40 CFR 60 to biomass ethanol production. The letter stated that Subpart RRR does not apply to ethanol derived from biomass. Subpart RRR applies to synthetic (chemical reaction of petroleum refining products) processes to produce organic chemicals (including ethanol).

Chapter 13, Sections 002 and 003 - National Emission Standards for Hazardous Air Pollutants (NESHAP)

Subpart A – General Provisions:

This subpart applies to those units subject to another NESHAP subpart. This subpart currently applies to Sandhills Renewable because the emission units at the source are subject to the requirements of other NESHAP standards.

Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines:

This subpart applies to stationary reciprocating internal combustion engines (non-road) located at a major (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs) or area (non-major) source of HAPs, except if the stationary RICE is being tested at a stationary RICE test cell/stand. Sandhills Renewable has the following limitations/operational requirements for their engines:

Emission Point #	Engine description	hp	Commence construction date	Determination	NESHAP ZZZZ Requirements – Limitations and Operational Requirements.
SV016	Emergency Fire Pump Engine	600	2007	Subject – new emergency CI RICE, at area source of HAPs {§63.6590(a)(2)(iii)}	Comply with NSPS Subpart IIII {§63.6590(c)(1)}

The following NESHAPS appear to apply but do not:

Subpart F – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry:

This subpart applies to manufacturing facilities which produce a hazardous air pollutant as the primary chemical {§63.100(b)(1)}, or use as reactant or manufacture as a product or co-product one or more of the organic hazardous air pollutants specified{§63.100(b)(2)}, and located at a plant site that is a major source (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs). This plant produces ethanol, which contains acetaldehyde and methanol, as well as the HAPs in the denaturant. This facility is not subject to this subpart because the primary product is ethanol (which is not on the HAP list in this subpart) and the facility is limited to less than 10 tons/year of individual HAP and less than 25 tons/year of combined HAPs.

Subpart G – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater:

This subpart applies to the same manufacturing facilities as Subpart F, but only for all of the process vents, storage vessels, transfer racks and recycled process water streams. Since this plant is exempt from Subpart F, it is also exempt from Subpart G.

Subpart H – National Emission Standards for Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Equipment Leaks:

This subpart applies to the same manufacturing facilities as Subpart F, but only for the following equipment: pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, instrumentation systems, and control devices or closed vent systems that are intended in operate in organic hazardous air pollutant service 300 hours or more during the calendar year. Since this plant is exempt from Subpart F, it is also exempt from Subpart H.

Subpart Q – National Emission Standards for Hazardous Air Pollutants for Industrial Process Cooling Towers:

This subpart applies to industrial process cooling towers that are operated with chromium-based water treatment chemicals and are located at major facilities for HAPs (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs). This facility is not subject to this subpart because the facility is limited below the major source thresholds. Also, no chromium-based water treatment chemicals were reported to be used for the cooling towers.

Subpart EEEE – National Emission Standards for Hazardous Air Pollutants for Organic Liquids Distribution (non-gasoline):

This subpart applies to major HAP facilities (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs), which have organic liquids distribution. The organic liquids distribution operation must have 7.29 million gallons per year or more either into or out of the operation to be subject to this subpart. Organic liquids are all crude oils other than black oil, and those liquids or liquid mixtures, except gasoline, that contain a total of 5 percent by weight or more of the organic HAP listed in the subpart (including acetaldehyde, methanol, benzene, carbon disulfide, cumene, ethyl benzene, hexane, toluene, xylenes). Fuels used on-site (such as fuels used for fleet refueling) are exempt from this subpart. This facility is not subject to this subpart because the facility is limited to below the major source thresholds. If the facility-wide HAP emissions exceed the major source threshold, then an analysis will need to be conducted on the organic liquid distribution operations to determine if this subpart is applicable.

Subpart FFFF – National Emission Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing:

This subpart applies to major HAP facilities (≥10 tons/year of individual HAP or ≥ 25 tons/year of combined HAPs), which own or operate miscellaneous organic chemical manufacturing process units (MCPU). An MCPU includes equipment necessary to operate a miscellaneous organic chemical manufacturing process, as defined in §63.2550 (process includes reaction, recovery, separation, purification, or other activity, operation, manufacture, or treatment which are used to produce a product of isolated intermediate), that produce an organic chemical(s) in the specified SIC (includes SIC 2869), and it processes, uses, or produces HAP. This facility is not subject to this subpart because the facility is limited below the major source thresholds. If the facility-wide HAP emissions exceed the major source threshold, then the miscellaneous organic chemical manufacturing units and operations would be subject to this NESHAP.

Subpart JJJJJJ - National Emission Standards for Hazardous Air Pollutants for Area Sources: Industrial, Commercial, and Institutional Boilers:

This subpart applies to industrial, commercial, and institutional boilers located at area sources of HAPs. Boilers that burn only gaseous fuels or solid waste are not covered by this rule. The source burns only natural gas in their boilers and is therefore not subject to this rule.

Subpart VVVVVV- National Emission Standards for Hazardous Air Pollutants for Area Sources: Chemical Manufacturing:

This subpart applies to area sources which own or operate chemical manufacturing process units (CMPU). The CMPU must use as feedstocks, generate as byproducts, or produce as products any of the following HAP: 1,3-butadiene, 1,3-dichloropropene, acetaldehyde, chloroform, ethylene dichloride, hexachlorobenzene, methylene chloride, quinoline, arsenic compounds, cadmium compounds, chromium compounds, lead compounds, manganese compounds or nickel compounds. Additionally the HAP must be present in feedstocks or must be generated or produced in the CMPU at concentrations greater than 0.1 % for carcinogens and 1.0% for non-carcinogens as defined by the Occupational Safety and Health Administration (OSHA) (percentages are determined on a mass basis). A CMPU includes all process vessels, equipment, and activities necessary to operate a chemical manufacturing that produces a material or a family of materials described by North American Industry Classification System code 325.

Ethanol plants have a NAICS coded of 325193. Acetaldehyde is produced along with ethanol in the CMPU. The concentration of acetaldehyde in the CMPU is less than 0.1% and it is not a feedstock or product, therefore this source is not subject to this subpart per §63.11494(a)(2).

Title 129, Chapter 13, Section 004 – Hazardous Air Pollutants (MACT and T-BACT)

This facility is subject to Best Available Control Technology (BACT) since potential individual HAP emissions exceed 2.5 tons/year and combined HAP emissions exceed 10 tons/year. All of the BACT equipment/activities are similar in ethanol plants that emit less than 100 tons/year of VOC, 10 tons/year of individual HAP, and 25 tons/year of combined HAPs. The Department has determined that BACT equipment and activities shall include the following:

Process	BACT Equipment/Activities
Fermentation and Distillation	CE004: Fermentation scrubber
Ethanol and Denaturant Loadout	Submerged Filling CE009: Ethanol Loadout Flare
DDGS Drying, Cooling, Storage and Loadout	CE007: Regenerative Thermal Oxidizer
Fugitive Emissions	Tanks are equipped with Internal Floating Roofs

Proposed changes to the specific permit requirements of Operating Permit #OP23R2-035 issued June 4, 2024 made in Significant Operating Permit Revision #OP26M2-021 received on May 15, 2026 are in bold print and underlined, deletions are in ~~strikethrough~~ and the descriptions of changes to permit conditions are in *italics*.

SPECIFIC PERMIT CONDITIONS DISCUSSION:

III. REVISED SPECIFIC PERMIT CONDITIONS:

(B) Specific Conditions for Fermentation and Distillation Operations

(1) Permitted Emission Points:

(a) The following table identifies emission points, emission units, permitted capacities, permitted fuel types, required control equipment the source must operate, and applicable standards at the source at the time of permit issuance, in accordance with operating permit ~~application~~ #23R2-035, **issued June 4, 2024**, ~~received December 1, 2023~~, ~~and~~ construction permit **CP25-027, issued March 11, 2026** ~~#17-044, issued November 1~~, ~~2017~~, **and operating permit significant modification application OP26M2-021, received May 15, 2026,** including any supporting information received prior to issuance of this permit:

Emission Point ID#: SV004			
Control Equipment ID# and Description	**Emission Unit Description**	**Applicable NSPS Requirements**	**Applicable NESHAP Requirements**
CE004: Fermentation and Distillation Scrubber, installed 2014	Precondenser	None	None
	Beer Degasser		
	MIXTANK: Slurry Mix Tank		
	LIQTANK: Liquefaction Tank		
	YEASTPROP: Yeast Propagation Tank		
	FERM1: Fermenter #1, maximum capacity of 882,791 gallons, installed 2006		
	FERM2: Fermenter #2, maximum capacity of 882,791 gallons, installed 2006		
	FERM3: Fermenter #3, maximum capacity of 882,791 gallons, installed 2006		
	FERM4: Fermenter #4, maximum capacity 882,791, installed 2026		
	Beer Well, maximum capacity of 1,144,137 gallons, installed 2006		
	C-4201: Beer Column		
	C-4202: Stripper		
	C-4203: Rectifier		
	VS-4301: Molecular Sieve #1		
	VS-4302: Molecular Sieve #2		
	E-4501: Evaporator #1		
	E-4304: 200-Proof Condenser #1		
	E-4305: 200-Proof Condenser #2		
	PCTANK: Process Condensate Tank		
	WSTANK: Whole Stillage Tank, maximum capacity 177,476 gallons, installed 2006		
	E-4502: Evaporator #2		
	E-4503: Evaporator #3		
	SYTANK: Syrup Tank, maximum capacity 118,975 gallons, installed 2006		
	TSTANK: Thin Stillage Tank, maximum capacity 129,219 gallons, installed 2006		
	CF-5101: Centrifuge #1		

	CF-5102: Centrifuge #2		
	CF-5103: Centrifuge #3		
	CF-5104: Centrifuge #4		

(2) Emission Limitations and Testing Requirements:

(a) Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits. Performance testing, if required, shall be conducted in accordance with Standard Condition I.(M).

Emission Point ID#: SV004				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
VOC	**15.5** ~~12.11~~ lbs/hr[1,~~2~~2,~~3~~]	Three 1-hour test runs or test method average	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(2)(a); Title 129, Chapter 6, Section 003.13** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(C)(4)~~	Yes
Acetaldehyde	**8.10 tpy** ~~1.12 lb/hr~~[~~3~~,4]	**Twelve-month rolling average** ~~Three 1-hour test runs or test method average~~	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(2)(a)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(A)(1)~~	Yes

Emission Point ID#: SV004				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
~~Total Combined~~ HAPs	~~1.42 lb/hr~~[3,4]	~~Three 1-hour test runs or test method average~~	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(2)(a)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(A)(2)~~	~~Yes~~
	minimum control efficiency of 65 percent or ≤ 20 $ppmv_{,dry}$[3]	**Speciation and Quantification of HAP composition at inlet and outlet** ~~Three 1-hour test runs or test method average~~	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(2)(a)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(C)(5); (Title 129, Chapter 27)*~~ Title 129, Chapter 13, Section 004	Yes
Opacity	< 20%[3 ~~1~~]	6-Minutes	~~(Title 129, Chapter 20, Section 004)*~~ Title 129, Chapter 15, Section 001.04	No

[1] Expressed as weight of VOC.
[2] The source requested a lower permitted emission rate for VOC than what is specified in Construction Permit CP25-027, Condition III.(B)(2)(a), issued March 11, 202 in order to keep the source a synthetic Class II.
[3] Compliance with Conditions III.(B)(3)(e) demonstrates compliance with opacity limitations.

~~[1] Compliance with Conditions III.(B)(3)(g b) and (B)(3)(e) demonstrates compliance with opacity limitations.~~
~~[2] Expressed as **weight** mass of VOC.~~
~~[3] Compliance with Condition III.(B)(3)(c) or (B)(3)(d) demonstrates compliance with VOC and HAP limitations.~~
~~[4] Construction Permit CP17-044 Condition XIII.(A) had a facility-wide limit of 10 tpy for any individual HAPs, and 25.0 tpy for total combined HAPs. The fermentation (SV004) and RTO (SV007) stacks are the main individual HAP (acetaldehyde) and total HAPs emitted. These facility-wide limitations were converted to lb/hr limitations for these two emission points, based on their PTE lb/hr rates.~~

(b~~a~~) **VOC and HAP emissions from the fermentation and distillation operations shall be controlled by the fermentation scrubber (CE004) with chemical addition. Chemical addition may not be required provided the requirements of Condition III.(B)(3)(c) are met. [Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(2)(b); Title 129, Chapter 13, Section 004.02]**

(c) The source may demonstrate through testing in accordance with Condition I.(M), or the use of CEMS, that chemical addition is not necessary. Testing completed after May 8, 2007, and approved by the DWEE, may be used to demonstrate chemical addition is not necessary [Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(2)(c)].

(3) Operational and Monitoring Requirements:

~~(a) VOC and HAP emissions from the fermentation and distillation operations shall be controlled by the fermentation scrubber (CE004) with chemical addition. Chemical~~

~~addition may not be required provided the requirements of Condition III..(B)(4)(d) are met. [Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(C)(1); Title 129, Chapter 27*~~; Title 129, Chapter 13, Section 004]

(a) All emissions from the emission units identified in Condition III.(B)(1)(a) shall be controlled by pollution control equipment as identified in Condition III.(B)(1)(a) [Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(3)(a)].

(b) The source shall demonstrate compliance with the emissions limitations of Condition III.(B)(2)(a) through the use of CEMS or performance testing. [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(3)(b)].

(i) In the event of a change in compliance methodologies, the source shall submit a written notification to the DWEE within two business days of the change occurring. The notification shall include the following information:

1. **The reason for the change in methodologies,**
2. **The date associated with the change, and**
3. **The source's compliance demonstration plans.**

(ii) The CEMS shall be equipped with a device capable of continuously monitoring exhaust gas flow rate.

1. **The exhaust gas flow rate shall be recorded at least once every 15 minutes or more frequently to ensure that flow rate data is recorded in conjunction with the data recorded for Condition III.(B)(3)(b)(iv).**

(iii) The CEMS and exhaust gas flow rate monitor shall be operated in accordance with the applicable portions of the following rules:

1. **40 CFR 60.13**
2. **40 CFR 60 – Appendix B**
3. **40 CFR 60 – Appendix F**

A. All valid data shall be used when calculating emissions concentrations.

(iv) The CEMS shall sample, analyze, and record data at least once every 15 minutes, while any associated emission units are operational, and in accordance with 40 CFR Part 60.13.

(c) The following requirements shall apply when using CEMS to demonstrate compliance with Condition III.(B)(2)(a) [Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(3)(c)]:

(i) Acetaldehyde emissions shall be calculated in the following manner:

1. **Hourly acetaldehyde emissions shall be calculated in accordance with the applicable portions of 40 CFR 60.13.**
2. **Daily acetaldehyde emissions (in pounds per day) shall be calculated by summing all hourly data obtained for that calendar day.**
3. **Monthly acetaldehyde emissions (in tons per month) shall be calculated by summing all daily acetaldehyde emissions (in pounds per day) for the calendar month and dividing by 2,000 pounds per ton.**

(ii) VOC emissions shall be calculated in accordance with the applicable portions of 40 CFR 60.13.

(iii) Data Substitution:

1. **In the event that the CEMS becomes non-operational for a period of less than 24 hours, the permittee shall calculate the average hourly emissions occurring during the hour before and the hour after the event and substitute that emissions rate for each hour of non-operation.**
2. **In the event the CEMS becomes non-operational for a period of 24 hours or more, the permittee shall utilize the following steps for data substitution and scrubbing liquid and chemical injection parameters for the fermentation scrubber (CE004) after the initial 24 hours of the CEMS non-operational period.**
   - **A. In the third quarter of each year, an average hourly emission rate calculated during peak-to-peak fermentation cycle shall be established during consistent scrubbing liquid flow rate and temperature, and chemical addition rate to the fermentation scrubber during normal plant operation. An emission factor for data substitution shall be derived by calculating the average hourly emission rate during this peak-to-peak fermentation cycle and used for each hour of CEMS non-operational period.**
   - **B. Optionally, from November 1 to March 31, an average hourly emission rate calculated during peak-to-peak fermentation cycle can be established during consistent scrubbing liquid flow rate and temperature, and chemical addition rate to the fermentation scrubber during normal plant operation. An emission factor for data substitution shall be derived by calculating the average hourly emission rate during this peak-to-peak fermentation cycle and used for each hour of CEMS non-operational period from November 1 to March 31.**
   - **C. Failure to derive a peak-to-peak fermentation cycle emission factor within the third quarter of each year shall not be potentially considered a violation of this permit condition unless the derivation was not conducted in the third quarter for two successive years.**
   - **D. Peak-to-peak fermentation cycle is defined as being equal to the average fermentation time for one fermentation tank divided by the total number of fermenters connected to the fermentation scrubber.**

(**d**~~b~~) The operation of the scrubber **CE004** shall be in accordance with the following requirements: [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(B)(3)(d)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(C)(3); Title 129, Chapter 27*~~; Title 129, Chapter 13, Section 004]

(i) The fermentation scrubber shall be operated at all times when the associated emission units are in operation.

(ii) The fermentation scrubber shall be properly installed, operated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the fermentation scrubber shall be kept on site and readily available to Department representatives.

(iii) The fermentation scrubber shall be equipped with devices capable of monitoring the following operating parameters: scrubbing liquid flow rate, chemical addition flow rate, pressure differential, and scrubbing liquid temperature.

1. **The monitoring devices shall be properly installed, operated, calibrated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, maintenance, and calibration of the monitoring devices shall be kept on site and readily available to Department representatives.**

~~The fermentation scrubber shall be equipped with devices capable of continuously monitoring operating parameters including, at a minimum, the scrubbing liquid temperature, scrubbing liquid flow rate, chemical addition flow rate, and pressure differential. Except for scrubbing liquid and chemical addition flow rates, operating parameter readings shall be recorded at least once each day the fermentation scrubber is in operation. The scrubbing liquid flow rate shall be recorded continuously. When chemical is added to the scrubbing liquid, the flow rate of the chemical being added shall be recorded continuously. The indicators shall be properly installed, operated, calibrated, and maintained. Manufacturer's documentation shall be kept on site and~~ **~~readily available to Department representatives.~~**

(iv) **When using performance testing to demonstrate compliance with Condition III.(B)(2)(a) the following records shall be kept in the manner specified below.**

1. **The scrubbing liquid flow rate shall be recorded continuously.**
2. **When chemical is added to the scrubbing liquid, the flow rate of the chemical being added shall be recorded continuously.**
3. **Scrubber pressure differential shall be recorded continuously.**
4. **Scrubbing liquid temperature shall be recorded at least once per day.**
5. **For any period in which the CEMS is not operational, the source shall also preserve records documenting the parameters above for at least 24 hours immediately before and after this period.**

(v) **When using performance testing to demonstrate compliance with Condition III.(B)(2)(a), the scrubber operating parameters shall be maintained at the levels recorded during the most recent valid performance test conducted at the facility as described below:**

1. **Scrubber liquid shall be comprised of only well water to ensure consistent liquid temperature. The well water may be treated with a reverse osmosis water treatment system if it can be demonstrated that the scrubbing liquid temperatures are maintained consistently with the temperatures recorded during the most recent valid performance test.**
2. **The pressure differential shall be maintained within the range recorded; and,**
3. **The scrubbing liquid flow rate, flow rate of chemical additions, and concentration of the chemical injected into the scrubber shall be maintained at or above the levels recorded during the most recent performance test that demonstrated compliance with the permitted emission limits of Condition III.(B)(2)(a).**

~~(iv) The scrubber operating parameters shall be maintained at the levels recorded during the most recent valid performance test conducted at the facility as described below:~~

~~1. Scrubber liquid shall be comprised of only well water to ensure consistent liquid temperature. The well water may be treated with a reverse osmosis water treatment system if it can be demonstrated that the scrubbing liquid temperatures~~

~~are maintained consistently with the temperatures recorded during the most recent valid performance test.~~

~~2. The pressure differential shall be maintained within the range recorded; and,~~

~~3. The scrubbing liquid flow rate, flow rate of chemical additions, and concentration of the chemical injected into the scrubber shall be maintained at or above the levels recorded.~~

(v**i**) Routine observations (at least once each day of fermentation scrubber operation) shall be conducted to determine whether there are leaks, noise, atypical operating parameters (e.g., scrubbing liquid flow rate), or other indications that may necessitate corrective action. If corrective action is required, it shall occur immediately.

~~(c) In order to demonstrate compliance with the VOC and HAP limitations in Condition III.(B)(3), the source shall obtain pounds per hour (lb/hr) emission factors for individual HAPs, total HAPs, and VOCs by conducting performance testing on the Fermentation Scrubber (CE004). The performance testing frequency shall be as described below [Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(C)(6); (Title 129, Chapter 8, Sections 004.01 and 015.03 and Chapter 34)*; Title 129, Chapter 6, Sections 003.03 and 003.13C and Chapter 15, Section 005]:~~

~~(i) By March 15th of each year, the source shall calculate the rolling 12-month total combined emissions of acetaldehyde (or largest single HAP) from the Fermentation Scrubber (CE004) and RTO (CE007).~~

~~1. To calculate the rolling 12-month HAP emissions from the Fermentation Scrubber (CE004) and RTO (CE007), the source shall use the emission factors obtained from the testing as required in Condition III.(B)(3)(c)(ii) below.~~

~~2. The source shall use the following calculation methodology to calculate the monthly acetaldehyde (or largest single HAP) emissions from the Fermentation Scrubber (CE004) and RTO (CE007). [(Title 129, Chapter 8, Sections 004.01 and 015.03 and Chapter 34)*; Title 129, Chapter 6, Sections 003.03 and 003.13C and Chapter 15, Section 005]~~

~~$E_T = (CHE_F) \times (OH_F) + (CHE_R) \times (OH_R) / (2{,}000 \text{ lbs/ton})$~~

~~Where:~~
~~E_T = Total combined controlled emissions (tons/month)~~
~~CHE_F = Controlled emissions from Fermentation Scrubber (lbs/hr)~~
~~OH_F = Operating hours of Fermentation Scrubber (hrs/month)~~
~~CHE_R = Controlled emissions from RTO (lbs/hr)~~
~~OH_R = Operating hours of RTO (hrs/month)~~

~~3. The source shall submit to the NDEE its rolling 12-month Annual Single Largest HAP Report (from March 1 of the previous year through the last day of February of the current year) total emissions of acetaldehyde (or largest single HAP) from the Fermentation Scrubber (CE004) and RTO (CE007), including supporting calculations. The source shall establish a testing tier for Fermentation Scrubber (CE004) in accordance with the Testing Tier Schedule below.~~

~~Testing Tier Schedule~~		
~~Tier~~	~~Rolling 12-Month Total Emissions of Largest Single HAP~~	~~Testing Frequency~~
~~1~~	~~≥0 tons per year and <5 tons per year~~	~~Annual~~
~~2~~	~~≥5 tons per year and <8 tons per year~~	~~Semi-Annual~~
~~3~~	~~≥8 tons per year~~	~~Quarterly~~

4. Upon issuance of this permit, the initial testing frequency for the Fermentation Scrubber (CE004) shall be in accordance with Tier 1 prescribed in the Testing Tier Schedule above. The schedule for testing at the RTO (CE007) will be as determined in Condition III.(C)(3)(b).

5. The information required in the Annual Single Largest HAP Report shall be submitted to NDEE by March 31 of each calendar year.

6. The information submittal required in Annual Single Largest HAP Report. shall be considered a separate requirement and shall be submitted separately from the annual air emissions inventory required by Condition II.(A)(3).

(ii) Performance testing for the Testing Tier Schedule shall begin April 1 of each year and be in accordance with the following:

1. For a Tier 1 source, one test shall be completed during the third calendar quarter (July through September) each year testing is required.

2 For a Tier 2 source, one test shall be completed during the third calendar quarter (July through September) and the second test shall be a minimum of four (4) months but no more than seven (7) months after the third calendar quarter test.

A. The emission factors determined from the third calendar quarter test shall be used at a minimum to calculate HAP emissions beginning April 1 and through October 31 of each year.

B. The emission factors determined from the second testing event shall be used at a maximum to calculate HAP emissions from November 1 through March 31 of each year.

3. For a Tier 3 source, the timeframe between tests shall be approximately the same number of days. The emission factor determined from each emission test may only be used in the calendar quarter the emission test was completed.

4. For Tier 1, 2 and 3 sources that fail to perform or have invalid emission testing as required in Condition III.(B)(3)(c)(ii), the source shall use the highest emission factor for each pollutant determined from the last five valid emission tests until valid emission testing is completed, unless alternate emission factors are approved by the NDEE.

(iii) All testing conducted in accordance with Condition III.(B)(3)(c)(ii) shall also be used to obtain lb/hr VOC emission factors for the Fermentation Scrubber (CE004).

1. The source shall use the same calculation methodology as required in Condition III.(B)(3)(c)(i)2. to calculate VOC emissions from the Fermentation Scrubber (CE004).

(iv) The testing protocol required in Condition I.(M)(1)(b) shall identify all operating ranges that testing, as required in this condition, will cover.

(v) Only one valid performance test may be conducted at each operating range when conducting performance tests on the Fermentation Scrubber (CE004).

1. Subsequent performance tests may be conducted if the facility chooses to change any one or all operational parameters (chemical addition rate, type of chemical used, chemical concentration, and liquid flow rate) in order to demonstrate compliance with permitted limits.

(d) The operational, monitoring, and testing requirements in Conditions III.(B)(4)(b)(iii) through (vi) and (viii), and Condition III.(B)(4)(c) are no longer in effect if the source

operates an approved CEMS or PEMS monitoring system. [(Title 129, Chapter 8, Section 015)*; Title 129, Chapter 6, Section 003.13].

(i) If the source chooses to utilize a CEMS or PEMS monitoring system, the source shall notify the NDEE at least sixty (60) days prior to installation of the monitoring system.

(ii) Upon installation of a CEMS or PEMS, the source shall meet the following, as appropriate:

1. All CEMS shall:

A. Comply with applicable Performance Specifications found in 40 CFR Part 60, Appendix B and F, 40 CFR 60.13 and 40 CFR 60.7.

B. Exhaust gas flow rate and monitored pollutant concentrations shall be continuously monitored and record data at least every 15 minutes.

C. Sample, analyze, and record data at least every 15 minutes while the emissions unit is operating.

D. Until Fourier Transform Infrared (FTIR) CEMS testing is addressed by 40 CFR Part 60, Appendix F, the NDEE shall require a Relative Accuracy Test Audit (RATA) once every eight (8) calendar quarters and a Cylinder Gas Audit (CGA) every calendar quarter that a RATA does not occur.

2. When the FTIR and/or VOC CEMS are non-operational, the following parameters shall be followed;

A. In the event that the CEMS becomes non-operational for a period of less than 24 hours, the source shall calculate the average hourly emissions occurring during the hour before and the hour after the event and substitute that emissions rate for each hour of non-operation.

B. In the event the CEMS becomes non-operational for a period of 24 hours or more the source shall utilize the following steps for data substitution for water and chemical injection rates and emission rate for each hour of operation during the CEMS non-operational period.

i. In the third quarter of each year, an average hourly rate calculated during peak-to-peak fermentation cycle shall be established during consistent water and chemical addition rates to the Fermentation Scrubber (CE004) during normal plant operation. An emission factor for data substitution shall be derived by calculating the average hourly emission rate during this peak-to-peak fermentation cycle and used for each hour of CEMS non-operational period.

ii. Optionally, from November 1 to March 31, an average hourly rate calculated during peak-to-peak fermentation cycle can be established during consistent water and chemical addition rates to the Fermentation Scrubber (CE004) during normal plant operation to be utilized from November 1 to March 31. An emission factor for data substitution shall be derived by calculating the average hourly emission rate during this peak-to-peak fermentation cycle and used for each hour of CEMS non-operational period from November 1 to March 31.

iii. Failure to derive a peak-to-peak fermentation cycle emission factor within the third quarter of each year shall be considered a violation of this permit.

~~iv. The following definition applies for purposes of Condition III.(B)(3)(d)(ii)2.B., above:~~

~~"Peak-to-peak fermentation cycle" is equivalent to the average fermentation time for one fermentation tank divided by the total number of fermenters connected to the Fermentation Scrubber (CE004). For example, if the average fermentation time is 60 hours, and the site has 4 fermentation tanks, then the peak-to-peak fermentation cycle would be 15 hours (60 hours divided by 4 fermentation tanks).~~

~~3. All PEMS shall:~~

~~A. Comply with applicable Performance Specifications found in (Title 129, Chapter 34, Section 009 through 015)* Title 129, Chapter 15, Section 005.09 through 005.15 or Appendix B, Performance Specification 16; and,~~

~~B. Sample, analyze, and record data at least every 15 minutes, or at another less frequent interval approved by the NDEE, while the emissions unit is operating.~~

(e) A source representative shall conduct visible emissions surveys for emission point SV004 on a daily basis. These surveys shall be conducted during daylight hours while each emission unit is operating under normal conditions. [(~~Title 129, Chapter 8, Sections 004.01B and 013; Chapter 20, Section 004)*~~ Title 129, Chapter 6, Sections 003.03 and 003.11; Chapter 15, Section 001.04]:

(i) For deviation reporting purposes, visible emissions (excluding water vapor) from any emission point shall be considered a deviation and shall be reported in accordance with Condition II.(A).

(4) Recordkeeping and Reporting Requirements:

(a) The source shall maintain records documenting when routine observations were performed with a description, including operating parameters (e.g., pressure differential readings, scrubbing liquid flow rates) and any atypical observations for periods when performance testing is used to demonstrate compliance with Conditions III.(B)(2)(a) or the CEMS is not operational for longer than 24 hours [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(a)].

(b) The source shall maintain records documenting when routine maintenance and preventive actions were performed with a description of the maintenance and/or preventive action performed. [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(b)].

(c) The source shall maintain records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made. Reporting to the Department shall be in accordance with Chapter 15, Section 006.05. [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(c)].

(d) The source shall maintain records documenting operating parameters as specified in Condition III.(B)(3)(d)(v) when using performance testing to demonstrate compliance with Condition III.(B)(2)(a), and for any period in which the CEMS is not operational. [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(d)].

(e) The source shall maintain records documenting the quantity of VOC, HAPs, and acetaldehyde emitted for each month when using the CEMS to demonstrate

compliance with Condition III.(B)(3)(c). [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(e)].

(f) Recordkeeping and reporting associated with the CEMS shall be in accordance with 40 CFR 60.7. If the CEMS is used for compliance with the emissions limitations of Conditions III.(B)(2)(a), excess emissions are defined as any calculated 12-month rolling acetaldehyde emission rate that exceeds the applicable emission limit in Condition III.(B)(2)(a) or any one hour VOC emission rate which exceeds the applicable emission limit in Condition III.(B)(2)(a). [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(f)].

(i) The semiannual reports specified in 40 CFR 60.7(c) and required by Condition III.(B)(5)(f) shall also include the following information:

1. The acetaldehyde quantity recorded for each month in the reporting period.

2. The maximum recorded hourly VOC emission rate for the previous six (6) months and the emission rates for fermentation scrubber, as determined by performance testing.

3. A Data Assessment Report for the CEMS which at a minimum shall contain the information specified in 40 CFR 60 Appendix F, Procedure 1, Section 7: Reporting Requirements.

(g) The source shall maintain records documenting scrubbing liquid flow rate and temperature, chemical addition rate and emission rate used to determine data substitution emission factors. [Construction Permit CP25-027 issued March 11, 2026, Condition III.(B)(5)(g)].

~~(a) The source shall keep the following records associated with the Fermentation Scrubber to demonstrate compliance for Condition III.(B)(4)(b): [Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(3)]~~

~~(i) Records documenting when routine observations were performed with a description, including operating parameters (e.g., pressure differential readings, scrubbant flow rates) and any atypical observations.~~

~~(ii) Records documenting when routine maintenance and preventive actions were performed with a description of the maintenance and/or preventive action performed.~~

~~(iii) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made. Reporting to the Department shall be in accordance with Chapter 35, Section 005* and Title 129, Chapter 15, Section 006.05.~~

~~(b) The source shall keep records documenting the amount of acetaldehyde (or largest single HAP) emitted at EP-03 for each month and each period of twelve consecutive months. All entries shall be recorded in tons. [Title 129, Chapter 8, Section 004.02]~~

~~(c) If a CEMS or PEMS is utilized, all CEMS or PEMS recorded data shall be documented and kept on-site [(Title 129, Chapter 8, Section 004.02)* Title 129, Chapter 6, Section 003.03].~~

(**h**~~d~~)The results of each visible emissions survey shall be recorded in a log, which shall include, at a minimum, the following items [~~Title 129, Chapter 8, Section 004.01*; Title 129, Chapter 20, Section 004*;~~ Title 129, Chapter 6, Section 003.03; Title 129, Chapter 15, Section 001.04]:

(i) The emission points included in the survey.

(ii) All emission points from which visible emissions occurred (except for water vapor).

(iii) Emission points for which the emission units were not in operation during the survey.

(iv) Each entry shall be dated and initialed by the person conducting the visible emissions survey.

On September 18, 2025, the DWEE received an air construction permit revision application from Sandhills. According to the application, Sandhills proposed to increase the production of denatured ethanol from 52.5 million gallons per year (MMgal/yr) to 80 MMgal/year. The construction permit, CP25-027 was issued on March 11, 2026.

Sandhills constructed one new fermentation tank. Sandhills also requested to increase the VOC emission limit for the Fermentation and Distillation Scrubber (CE004) from 12.11 to 17.00 pounds per hour (lb/hr) and the acetaldehyde emission limit for CE004 from 4.91 to 8.10 tons per year (ton/yr).

In follow up discussions with the source, Sandhills decided to lower the VOC emissions limit for CE004 from 17.0 lb/hr to 15.5 lb/hr to keep them below the thresholds of a Class I permit.

III. REVISED SPECIFIC PERMIT CONDITIONS:

(C) Specific Conditions for DDGS Drying and Cooling

(1) Permitted Emission Points:

(a) The following table identifies emission points, emission units, permitted capacities, permitted fuel types, required control equipment the source must operate, and applicable standards at the source at the time of permit issuance, in accordance with operating permit ~~application #~~23R2-035, **issued June 4, 2024**, ~~received December 1, 2023~~, ~~and~~ construction permit **CP25-027, issued March 11, 2026** ~~#17-044, issued November 1~~, ~~2017~~, **and operating permit significant modification application OP26M2-021, received May 15, 2026,** including any supporting information received prior to issuance of this permit:

Emission Point ID#: SV007			
Control Equipment ID# and Description	**Emission Unit Description**	**Applicable NSPS Requirements**	**Applicable NESHAP Requirements**
CE007: Regenerative Thermal Oxidizer, maximum capacity of **9.0** ~~18.0~~ MMBtu/hr, natural gas fired, installed in 2006	DDGS Dryer, maximum drying capacity of 20 tons/hr, ring dryer, maximum heat capacity of 90 MMBtu/hr, natural gas fired, installed in 2006	None	None
	DDGS Cooler, installed in 2006	None	None

(2) Emission Limitations and Testing Requirements:

(a) Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits. Performance testing, if required, shall be conducted in accordance with Standard Condition I.(M).

Emission Point ID#: SV007				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
PM (filterable + condensable)	3.65 lb/hr[1]	Three 1-hour test runs or test method average	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(2)(a)** Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(5)(a)	Yes
PM_{10} (filterable + condensable)	3.65 lb/hr[1]	Three 1-hour test runs or test method average		Yes
SO_2	7.3 lb/hr[1]	Three 1-hour test runs or test method average	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(2)(a)** Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(5)(b)	Yes
NO_x	11.68 lb/hr[1]	Three 1-hour test runs or test method average	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(2)(a)** Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(5)(c)	Yes
CO	8.34 lb/hr[1]	Three 1-hour test runs or test method average	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(2)(a)** Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(5)(d)	Yes
VOC	9.0 lb/hr[1],[2]	Three 1-hour test runs or test method average	**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(2)(a)** Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(5)(e)	Yes

Emission Point ID#: SV007				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
~~Acetaldehyde~~	~~1.11 lb/hr[1],[3]~~	~~Three 1-hour test runs or test method average~~	~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(A)(1)~~	~~Yes~~
~~Total Combined HAPs~~	~~2.42 lb/hr[1],[3]~~	~~Three 1-hour test runs or test method average~~	~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(A)(2)~~	~~Yes~~
Opacity	<20%[~~3~~4]	6-Minutes	~~Title 129, Chapter 20, Section 004*;~~ Title 129, Chapter 15, Section 001.04	No

[1] Performance testing required in accordance with Condition III.(C)(2)(b).

[2] Expressed as mass of VOC.

[3] ~~Construction Permit CP17-044 Condition XIII.(A) had a facility-wide limit of 10 tpy for any individual HAPs, and 25.0 tpy for total combined HAPs. The fermentation (SV004) and RTO (SV007) stacks are the main individual HAP (acetaldehyde) and total HAPs emitted. These facility-wide limitations were converted to lb/hr limitations for these two emission points, based on their PTE lb/hr rates.~~

[~~3~~4] Compliance with Condition III.(C)(3)(e) demonstrates compliance with Opacity limitation.

(b) Performance tests shall be conducted on the RTO stack (SV007) for PM, PM_{10}, SO_2, NO_x, CO, **and** VOC. ~~and HAPs. The performance tests shall include speciation and quantification of the HAP composition of the emissions.~~ [~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(6); (Title 129, Chapter 8, Section 004.01B; Chapter 34, Section 001)*~~ Title 129, Chapter 6, Section 003.03; Chapter 15, Section 005.01]

(i) Performance tests shall be conducted a minimum of every three years from the most recent valid performance test.

(3) Operational and Monitoring Requirements:

~~(a) Emissions from the drying and cooling processes while producing DDGS shall be controlled by a regenerative thermal oxidizer (RTO), CE007. [Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(1)]~~

~~(b) Operation of the RTO shall be in accordance with the following requirements: [Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(4)]~~

(a) **Operation of the DDGS dryer and RTO system shall be limited to 2,000 hours per any period of twelve (12) consecutive calendar months. At no time during the first eleven (11) calendar months after permit issuance shall the sum of all the previous months' operating hours equal or exceed the limit [Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(a); Title 129, Chapter 6, Section 003.13].**

NOTE: Per request by the source, Condition III.(C)(3)(a) differs from Construction Permit CP25-027, Condition III.(C)(3)(a), with the operational hours being less than the 3,000 hours limitation in order to maintain Class II synthetic minor status.

(b) The RTO shall be operated at all times when the associated emission units are in operation **[Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(b)].**

(c) The RTO shall be properly installed, operated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the RTO shall be kept on site and readily available to Department representatives **[Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(c)].**

(d) The RTO system shall be equipped with a thermocouple or equivalent device capable of continuously monitoring the temperature of the thermal oxidizer. The thermocouple or equivalent device shall monitor temperature on a continuous basis, with the one-hour average temperature recorded once per hour. The thermocouple or equivalent device shall be properly installed, operated, calibrated, and maintained. Manufacturer's documentation shall be kept on site and readily available to Department representatives **[Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(d)].**

(e) The one-hour average operating temperature of the RTO system shall be maintained at no less than the temperature from the most recent, valid performance test demonstrating compliance with all permitted emission limits. Prior to compliance being demonstrated, the temperature shall not be operated below 1,400 degrees Fahrenheit **[Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(e)].**

(f) Routine observations (at least once each day during daylight hours of RTO system operation) shall be conducted to determine whether there are visible emissions from the stack, leaks, noise, atypical operating parameters (e.g., pressure differential, temperature), or other indications that may necessitate corrective action. Corrective action shall be taken immediately if necessary. **[Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(f)].**

(g) The facility shall install a non-resettable hour meter or data collection system (DCS) to monitor and record the following [Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(3)(g)]:

(i) Hours of operation of the DDGS Dryer and RTO system.

(ii) If at any time the non-resettable hour meter or DCS identified in Condition III.(C)(3)(g) is non-operational, the source shall maintain operator logs recording the hours of operation of the DDGS Dryer and RTO. In the event that operator logs are not maintained during the period(s) in which the non-resettable hour meter or DCS is non-operational, it shall be assumed the DDGS Dryer and RTO are in operation during the non-resettable hour meter or DCS downtime.

~~(c) Operation of the DDGS dryer and RTO system shall be limited to 6,000 hours per any period of twelve (12) consecutive calendar months. [Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(2)]~~

(**h**~~d~~)Only natural gas shall be combusted as fuel in the RTO. Only natural gas shall be combusted as fuel in the dryer. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(2)(a)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(E)(3)~~]

(**i**~~d~~)A source representative shall conduct visible emission surveys for emission point SV007 on a daily basis. These surveys shall be conducted during daylight hours while each emission unit is operating under normal conditions. [(~~Title 129, Chapter 8, Sections 004.01B and 013; Chapter 20, Section 004)*~~ Title 129, Chapter 6, Sections 003.03 and

003.11; Chapter 15, Section 001.04]:

(i) For deviation reporting purposes, visible emissions (excluding water vapor) from any emission point shall be considered a deviation and shall be reported in accordance with Condition II.(A).

(4) Recordkeeping and Reporting Requirements:

(a) The source shall keep the following records for the operational and monitoring requirements for the RTO:

(i) Records documenting the temperature of the RTO system, including average hourly temperature readings while the dryers are in operation. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(5)(c)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(5)(c)~~]

(ii) Records documenting when routine observations were performed with a description, including operating parameters (e.g., temperature) and any atypical observations. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(5)(d)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(5)(d)~~]

(iii) Records documenting when routine maintenance and preventive actions were performed with a description of the maintenance and/or preventive action performed. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(5)(e)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(5)(e)~~]

(iv) Records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made. Reporting to the Department shall be in accordance with ~~(Chapter 35, Section 005)*~~ Chapter 15, Section 006.05. [**Construction Permit CP25-027, issued Marc 11, 2026, Condition III.(C)(5)(f)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(5)(f)~~]

(b) The source shall keep records of the hours of operation for the dryer/RTO system for each calendar month and for each period of twelve (12) consecutive calendar months. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(5)(a)].** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(5)(a)]~~

(c) The source shall keep fuel receipts for the natural gas from the supplier. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(C)(5)(b)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(5)(b)~~]

(d) The results of each visible emissions survey shall be recorded in a log, which shall include, at a minimum, the following items [~~Title 129, Chapter 8, Section 004.01*; Title 129, Chapter 20, Section 004*;~~ Title 129, Chapter 6, Section 003.03; Title 129, Chapter 15, Section 001.04]:

(i) The emission points included in the survey.

(ii) All emission points from which visible emissions occurred (except for water vapor).

(iii) Emission points for which the emission units were not in operation during the survey.

(iv) Each entry shall be dated and initialed by the person conducting the visible emissions survey.

On September 18, 2025, the DWEE received an air construction permit revision application from Sandhills. According to the application, Sandhills proposed to increase the production of denatured

ethanol from 52.5 million gallons per year (MMgal/yr) to 80 MMgal/year. The construction permit, CP25-027 was issued on March 11, 2026.

Sandhills requested the hours of operation of the DDGS dryer to be lowered from 6,000 hours per year to 3,000 hours per year as part of the permitting action.

In follow up discussions with the source, Sandhills decided to reduce the hours of operation to 2,000 hours per year to keep them below the thresholds of a Class I permit for VOCs.

III. REVISED SPECIFIC PERMIT CONDITIONS:

(I) Specific Conditions for Cooling Tower

(1) Permitted Emission Points:

(a) The following table identifies emission points, emission units, permitted capacities, permitted fuel types, required control equipment the source must operate, and applicable standards at the source at the time of permit issuance, in accordance with operating permit ~~application #~~23R2-035, **issued June 4, 2024**, ~~received December 1, 2023~~, ~~and~~ construction permit **CP25-027, issued March 11, 2026** ~~#17-044, issued November 1~~, ~~2017~~, **and operating permit significant modification application OP26M2-021, received May 15, 2026,** including any supporting information received prior to issuance of this permit:

Emission Point ID#: FS009			
Control Equipment ID# and Description	**Emission Unit Description**	**Applicable NSPS Requirements**	**Applicable NESHAP Requirements**
None	Cooling Tower, **4**~~5~~ cells, total circulation rate of **1,800,000** ~~900,000~~ gallons/hr, installed in **2024** ~~2006~~	None	None

(2) Emission Limitations and Testing Requirements:

(a) Pollutant emission rates from each emission point identified in the table below shall not exceed the permitted limits. Performance testing, if required, shall be conducted in accordance with Standard Condition I.(M).

Emission Point ID#: FS009				
Pollutant	**Permitted Limit**	**Averaging Period**	**Basis for Permit Limit**	**Performance Testing Required**
Opacity	<20%[1]	6-Minutes	~~Title 129, Chapter 20, Section 004*;~~ Title 129, Chapter 15, Section 001.04	No

[1] Compliance with Condition III.(I)(3)(b) and (I)(3)(c) demonstrates compliance with PM and Opacity limitations.

(3) Operational and Monitoring Requirements:

~~(a)~~ The cooling tower shall be properly installed, operated, and maintained. The manufacturer's operation and maintenance manual, or its equivalent, detailing proper operation, inspection, and maintenance of the cooling tower shall be kept on site and readily available to Department representatives. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(3)(a)]** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(J)(1)]~~

(b) The drift loss shall not exceed 0.005 percent. Verification of drift loss shall be by manufacturer's guarantee. Manufacturer's drift loss guarantee shall be kept on site and readily available to Department representatives, upon request. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(3)(b)** ~~(Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(J)(2)]~~

(c) The 12 month rolling average TDS concentration in the cooling water shall not exceed 2,750 ppm. A TDS sample shall be collected and tested at a minimum of once per calendar month. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(2)(a)** ~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(J)(3)~~]

(4) Recordkeeping and Reporting Requirements:

(a) The source shall keep records documenting when routine maintenance and preventive actions were performed with a description of the maintenance and/or preventive action performed. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(5)(a)**~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(10)(a)~~]

(b) The source shall keep records documenting equipment failures, malfunctions, or other variations, including time of occurrence, remedial action taken, and when corrections were made. Reporting to the Department shall be in accordance with **Chapter 15, Section 006** ~~Chapter 35, Section 005~~. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(5)(b)**~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(10)(b)~~]

(c) The source shall keep the manufacturer's drift loss guarantee. This record shall be kept for the life of the equipment. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(5)(c)**~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(10)(c)]~~

(d) The source shall keep records of the TDS concentration in cooling water for each sampling event. [**Construction Permit CP25-027, issued March 11, 2026, Condition III.(D)(5)(d)**~~Construction Permit CP17-044, issued November 1, 2017, Condition XIII.(N)(10)(d)~~]

On September 18, 2025, the DWEE received an air construction permit revision application from Sandhills. According to the application, Sandhills proposed to increase the production of denatured ethanol from 52.5 million gallons per year (MMgal/yr) to 80 MMgal/year. The construction permit, CP25-027 was issued on March 11, 2026. Changes are being made to Condition III.(I) to synchronize the requirements in the operating permit to construction permit CP25-027 issued March 11, 2026.

STATUTORY OR REGULATORY PROVISIONS ON WHICH PERMIT REQUIREMENTS ARE BASED:

Applicable regulations: Title 129 - Nebraska Air Quality Regulations as amended September 28, 2022.

Compliance with this permit shall not be a defense to any enforcement action for violation of an ambient air quality standard.

Fact Sheet Attachment: Facility Wide Emissions
for OP26M2-021

Facility Wide Pollutant Emissions as Limited by the Permit

Process or Unit	POLLUTANT PTE (tpy)					
	Particulate Matter (PM)	Particulate Matter (PM_{10})	Nitrogen Oxides (NO_x)	Sulfur Oxides (SO_x)	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)
Grain Handling, Storage, Cleaning, and Milling	31.57	11.90	-	-	-	-
Fermentation Scrubber	1.01	1.01	-	-	-	67.89
Thermal Oxidizer	3.65	3.65	11.68	7.30	8.34	9.00
Liquid Loadout	-	-	-	-	-	1.22
Loadout Flare	0.003	0.003	3.12	0.0403	5.20	0.57
Emergency Fire Pump	0.11	0.11	3.36	0.53	0.89	0.09
Boilers	6.13	6.13	41.26	1.75	40.47	4.47
Cooling Tower	9.04	4.97	-	-	-	-
WDGS Loadout						1.62
Paved Haul Roads - DDGS[1]	MOSTLY WDGS WILL BE PRODUCED					
Paved Haul Roads - WDGS	14.11	2.35	-	-	-	-
Equipment Leaks	-	-	-	-	-	6.58
Tanks	-	-	-	-	-	3.62
Facility-Wide Emissions as limited by the Permit	65.61	30.12	59.42	9.62	54.90	95.05

[1] Facility will mostly be producing WDGS, will produce DDGS depending on market.

Fact Sheet Attachment: Facility Wide Emissions assuming 100% DDGS Loadout

Facility Wide Hazardous Air Pollutant Emissions as Limited by the Permit

Hazardous Air Pollutant	Process or Unit PTE (tpy)								
	Fermentation Scrubber	Thermal Oxidizer	Liquid Loadout	Emergency Fire Pump	Boilers	Equipment Leaks	WDGS Loadout	Tanks	Estimated Actual
Acetaldehyde	8.10	0.81	1.13E-04	2.65E-05	-	1.32E-03	0.02	2.84E-04	8.94
Acrolein	0.93	0.462	-	8.27E-06	-	1.32E-03	3.26E-03	-	1.40
Benzene	-	2.04E-04	1.63E-03	8.15E-04	1.67E-03	-	-	6.55E-03	1.09E-02
Carbon disulfide	-	-	1.30E-05	-	-	-	-	5.24E-05	6.54E-05
Cumene	-	-	6.52E-05	-	-	-	-	2.62E-04	3.27E-04
Dichlorobenzene	-	1.16E-04	-	-	9.52E-04	-	-	-	1.07E-03
Ethyl benzene	-	-	3.26E-05	-	-	-	-	1.31E-04	1.64E-04
Formaldehyde	0.28	0.29	-	8.28E-05	5.95E-02	1.32E-03	4.33E-02	-	0.67
Hexane	-	0.17	3.26E-02	-	1.43	-		0.13	1.77
Lead Compounds	-	4.85E-05	-	-	3.97E-04	-		-	4.45E-04
Methanol	0.37	9.13E-02	1.13E-04	-	-	1.32E-03	8.66E-03	2.84E-04	0.47
Naphthalene	-	5.92E-05	-	1.37E-04	4.84E-04	-	-	-	6.80E-04
Polycyclic Organic Matter (POM)	-	8.56E-06	-	-	7.00E-05	-	-	-	7.86E-05
Toluene	-	3.30E-04	3.26E-03	2.95E-04	2.70E-03	-	-	0.01	1.97E-02
Xylene	-	-	3.26E-04	2.03E-04	-	-	-	-	5.29E-04
Arsenic Compounds (ASC)	-	1.94E-05	-	-	1.59E-04	-	-	-	1.78E-04
Beryllium Compounds (BEC)	-	1.16E-06	-	-	9.52E-06	-	-	-	1.07E-05
Cadmium Compounds (CDC)	-	1.07E-04	-	-	8.73E-04	-	-	-	9.80E-04
Chromium Compounds (CRC)	-	1.36E-04	-	-	1.11E-03	-	-	-	1.25E-03
Cobalt Compounds (COC)	-	8.15E-06	-	-	6.67E-05	-	-	-	7.48E-05
Manganese Compounds (MNC)	-	3.69E-05	-	-	3.02E-04	-	-	-	3.38E-04
Mercury Compounds (HGC)	-	2.52E-05	-	-	2.06E-04	-	-	-	2.32E-04
Nickel Compounds (NIC)	-	2.04E-04	-	-	1.67E-03	-	-	-	1.87E-03
Selenium Compounds (SEC)	-	2.33E-06	-	-	1.90E-05	-	-	-	2.14E-05
Total HAPS	9.68	1.83	3.81E-02	1.57E-03	1.50	5.26E-03	7.69E-02	0.15	13.29

FACT SHEET ATTACHMENT

Potential Emissions Changes Summary: Facility-Wide Emissions

Pollutant	Pre-Project PTE (ton/yr)[1]	Post Project PTE (ton/yr)	Change in PTE (ton/yr)
PM	64.52	65.61	1.09
PM_{10}	38.89	30.12	-8.77
$PM_{2.5}$	28.45	30.12	1.67
NO_x	84.42	59.42	-25.00
SO_x	24.22	9.62	-14.60
CO	72.07	54.90	-17.17
VOC	111.01	95.05	-15.96
Hazardous Air Pollutants			
Individual HAPs			
Acetaldehyde	8.24	8.94	0.70
Acrolein	2.58	1.40	-1.18
Hexane	1.16	1.77	0.61
Formaldehyde	1.45	0.67	-0.78
Methanol	0.73	0.47	-0.26
Total HAPs	15.36	13.29	-2.07

[1] Pre-project PTE obtained from Fact Sheet for: OP23R2-035

Changes in Greenhouse Gas Emissions from the DDGS Dryer

Greenhouse Gases	(kg/MMBtu) [1]	(tons/yr) [2]	(tons/yr) [3]
Carbon Dioxide	53.06	34742.43	11580.81
Methane	0.001	0.65	0.22
Nitrous Oxides	0.0001	6.55E-02	2.18E-02
Total GHGs (mass basis)		34743.15	11581.05
Total GHGs (CO2e equivalent) [4]		34776.48	11592.16

[1] All emission factors are default values from 40 CFR 98 Tables C-1 and C-2. This PTE summary follows the methodologies prescribed in 40 CFR Part 98.

[2] GHG (tons/yr) = [Emission Factor (kg/MMBtu)] x (Potential Heat Input Capacity MMBtu/hr)*(6,000 hrs/yr)]/(907.18 kg/tons) obtained from Fact Sheet for: OP23R2-035

[3] GHG (tons/yr) = [Emission Factor (kg/MMBtu)] x (Potential Heat Input Capacity MMBtu/hr)*(2,000 hrs/yr)]/(907.18 kg/tons) proposed in OP26M2-021

[4] tons CO_2e/yr = [(tons/yr CO2)*1]+[(tons/yr CH4)*21] + [(tons/yr N2O)*310]; CO_2 equivalents are found in 40 CFR Part 98 Subpart A Table A-1 Global Warming Potentials published on October 30, 2009 (Title 129, Chapter 1). The CO_2e for CO2 =1, for CH_4 =21, and for N_2O = 310. Did not change equivalents to updated numbers to maintain consistency with those used in OP23R2-035.

Fact Sheet Attachment: Grain Receiving, Storage, Cleaning, Hammermilling and DDGS Cooling and Storage

Potential to Emit Calculations for Controlled Grain Receiving, Storage, Cleaning, and Hammermilling and DDGS Cooling and Storage

Ethanol Facility: PM/PM_{10} Emissions from Grain Handling, Storage, Cleaning, and Milling

Emission Point ID#	Control Equipment ID	Unit Name	(A) Flow Rate	(B) Emission Factor	Controlled PM/PM_{10} Emissions	
			dscf/min	grains/dscf	(C) = (A)x(B)x60/7000 (lb/hour)[1],[2]	(D) = (C)x8760/2000 (ton/year)
SV001B	CE001B	Truck Receiving Baghouse	18,000	0.005	0.77	3.38
SV002A	CE002A	Grain Reclaim Baghouse	7,050	0.005	0.30	1.32
SV003A	CE003A	Hammermill Baghouse #1	4,000	0.005	0.17	0.75
SV003B	CE003B	Hammermill Baghouse #2	4,000	0.005	0.17	0.75
SV003C[3]	CE003C	Hammermill Baghouse #3	4,000	0.005	0.17	0.75
SV003D	CE003D	Hammermill Baghouse #4	4,000	0.005	0.17	0.75
				Total	1.76	7.71

[1] Conversion Factors: 7,000 grains per pound; 60 minutes per hour; 8,760 hours per year; 2,000 pounds per ton

[2] Emission factors in (lb/hr) are based on permit limits.

[3] Obtained from the fact sheet attachment to CP14-039

Fact Sheet Attachment: Grain Receiving, Storage, Cleaning, and Hammermilling and DDGS Storage

Fugitive Grain Handling Emissions

Potential to Emit Calculations for Grain Receiving, Storage, Cleaning, and Hammermilling and DDGS Storage

Assumptions

- The type of grain being handled at the facility is corn
- All grain is corn which has the highest Dustiness Ratio for the AP-42 emission factors.
- One Bushel of Corn produces 2.5 gallons of Ethanol

Process Data

Maximum Capacity (Anhydrous Ethanol Produced)	78,008,000	gallons per year			
Grain Required for Ethanol Production	2.68	gallons of Ethanol per bushel of corn			
Ethanol Grain Density:	56	lb/bushel for Corn			
Total Grain Receiving Throughput:	815,009	ton/yr	=	93.0	ton/hr
	815,009	ton/yr	=	29,107,463	bu/yr
Total DDGS Produced[8]	211,029	ton/yr DDGS			

PM/PM_{10} Uncaptured Emissions

Emission Point ID#	Emission Point Description	(A) Maximum Hourly Throughput (tons/hour)	(B) Annual Throughput (tons/year)	(C) Percent Fugitives[1]	Emission Factors[2] (lbs/ton) (D) PM	(E) PM_{10}	PM Emissions (F)[3] (lbs/hr)	(G)[4] (tons/yr)	PM_{10} Emissions (H)[5] (lbs/hr)	(I)[6] (tons/yr)
FS002[7]	Uncaptured Emissions from Grain Receiving	420	815,009	20%	0.035	0.0078	2.94	2.85	0.66	0.64
FS003	Grain Silo Vent Emissions	420	815,009	100%	0.025	0.006	10.50	10.19	2.52	2.45
FS003C	Surge Bin Emissions	65.1	815,009	100%	0.025	0.006	1.63	10.19	0.39	2.45
FS005	DDGS Loadout Emissions	280.0	211,029	100%	0.003	0.0008	0.84	0.32	0.22	0.08
FS008A	DDGS Storage Emissions	19.5	211,029	100%	0.003	0.0008	0.06	0.32	0.02	0.08
						Total	15.97	23.86	3.81	5.69

[1] 20% of the emissions generated by grain receiving are assumed to not be captured by the Truck Receiving Baghouse

[2] Emission Factors are from AP-42 Section 9.9.1 (5/2003)

[3] (A) x (C) x (D)

[4] (B) x (C) x (D) / 2,000 (lbs/ton)

[5] (A) x (C) x (E)

[6] (B) x (C) x (E) / 2,000 (lbs/ton)

[7] Emission Point should be modeled as two sources due to the Grain Receiving building having a NW and a SE door

[8] Multiplied by 14.5 lbs/bushel. DDGS loadout reported by facility

Fact Sheet Attachment:

SV004: Fermentation and Distillation

Emission Units Routed to Fermenation Scrubber (CE004)

Emission Unit ID	EU Description
WSTANK	Whole Stillage Tank
TSTANK	Thin Stillage Tank
SYTANK	Syrup Tank
FERM1	Fermenter #1
FERM2	Fermenter #2
FERM3	Fermenter #3
FERM4	Fermenter #4
BEERWELL	Beer Well
MIXTANK	Slurry Mix Tank
LIQTANK	Liquefaction Tank
YEASTPROP	Yeast Prop. Tank
PCTANK	Process Cond. Tank
C-4101[1]	Distillation Column
VS-4301, VS-4302[1]	Molecular Sieve
CF-51-1, CF-51-2, CF-51-3, CF-51-4[1]	Centrifuges
E-4502, E-4503[1]	Evaporators

[1] These units have not been given Emission Unit IDs by the NDEE. The identfiers listed were obtained from a facility diagram submitted to the NDEE by Sandhills Renewable Energy LLC.

Anhydrous Ethanol Produced (AEP):	78,008,000	gallons/year
	78.008	MMgal/year
	0.0089	MMgal/hr

Pollutant	Potential Controlled Emission Rate	
	Emission Factor	Emissions
	lb/hr	tpy
Particulate Matter (PM)[1]	0.23	1.01
Particulate Matter (PM_{10})[1]	0.23	1.01
Volatile Organic Compounds (VOC)[2]	15.50	67.89
Individual Hazardous Air Pollutants (HAPs)		
Acetaldehyde[3]	1.850	8.10
Acrolein	0.212	0.93
Formaldehyde	0.064	0.28
Methanol	0.085	0.37
Total HAPs	2.211	9.68

[1] PM/PM_{10} emission factor from June 2009 stack testing. HAP emission factors are average from June and September 2009 stack testing.

[2] The VOC emission factor, which has been incorporated as a permit limit, was requested by the facility as part of the operating permit application discussions, in order to keep facility-wide VOC emissions below 100 tons per year.

[3] Facility requested a PTE limit of 8.10 ton/yr for fermentation scrubber CE004

Fact Sheet Attachment: Thermal Oxidizer

Emission Point ID Number SV007

Potential to Emit Calculations for Emissions from the Thermal Oxidizer (CE007)
Emission Units Routed to the Thermal Oxidizer

Emission Unit ID	Emission Source
EUDDGSDRYER	DDGS Dryer
EUDDGSCOOLER	DDGS Cooler

Summary of Potential Emissions Emitted from Thermal Oxidizer

Limited annual operating hours: **2,000**

Pollutant	Potential Emission Rate (lbs/hr)	Potential Emission Rate (tons/year)
Particulate Matter (PM) [1]	3.65	3.65
Particulate Matter (PM_{10}) [1]	3.65	3.65
Nitrogen Oxides (NO_x) [1]	11.68	11.68
Sulfur Dioxide (SO_2) [1]	7.30	7.30
Carbon Monoxide (CO) [1]	8.34	8.34
Volatile Organic Compounds (VOC) [1]	9.00	9.00
Individual Hazardous Air Pollutants (HAP) [2]		
Acetaldehyde	0.81	0.81
Acrolein	0.46	0.46
Formaldehyde	0.29	0.29
Methanol	9.13E-02	9.13E-02
Benzene	2.04E-04	2.04E-04
Dichlorobenzene	1.16E-04	1.16E-04
Hexane	0.17	0.17
Lead Compounds	4.85E-05	4.85E-05
Naphthalene	5.92E-05	5.92E-05
Polycyclic Organic Matter (POM)	8.56E-06	8.56E-06
Toluene	3.30E-04	3.30E-04
Arsenic Compounds (ASC)	1.94E-05	1.94E-05
Beryllium Compounds (BEC)	1.16E-06	1.16E-06
Cadmium Compounds (CDC)	1.07E-04	1.07E-04
Chromium Compounds (CRC)	1.36E-04	1.36E-04
Cobalt Compounds (COC)	8.15E-06	8.15E-06
Manganese Compounds (MNC)	3.69E-05	3.69E-05
Mercury Compounds (HGC)	2.52E-05	2.52E-05
Nickel Compounds (NIC)	2.04E-04	2.04E-04
Selenium Compounds (SEC)	2.33E-06	2.33E-06
Total HAPs	1.83	1.83

[1] Emission factors (lb/hr) for PM, PM_{10}, NO_x, SO_2, CO and VOC are based on the permit limits which were requested by the facility.

[2] The Acetaldehyde, Acrolein, Formaldehyde, and Methanol emission factors have been derived based on testing done at the facility in October 2009 (scaled up 10% to account for operation at less than maximum capacity). Other HAP emissions are based on AP-42 Tables 1.4-1, 1.4-2, and 1.4-4.

Fact Sheet Attachment: Thermal Oxidizer (continued)

Emission Point ID Number SV007

Derivation of lb/hr HAP emission rates (other than acetaldehyde, acrolein, formaldehyde, and methanol)

Natural Gas Combustion Emissions take into account the 9.0 MMBtu/hr Thermal Oxidizer and 90.0 MMBtu/hr Dryer

Total Heat Input Capacity	99.0	MMBtu/hr			
Potential Natural Gas Throughput	0.097	MMscf/hr	=	850.2	MMscf/yr

Pollutant	(A) Emission Factor[1] (lb/MMscf)	(B) = (A) x MMscf/hr Potential Emission Rate (lbs/hr)	(C) = (B) x Hours Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Individual Hazardous Air Pollutants (HAP)				
Benzene	0.0021	2.04E-04	0.41	2.04E-04
Dichlorobenzene	0.0012	1.16E-04	0.23	1.16E-04
Hexane	1.8	0.1747	349.41	0.17
Lead Compounds	0.0005	4.85E-05	9.71E-02	4.85E-05
Naphthalene	0.00061	5.92E-05	0.12	5.92E-05
Polycyclic Organic Matter (POM)	0.0000882	8.56E-06	1.71E-02	8.56E-06
Toluene	0.0034	3.30E-04	0.66	3.30E-04
Arsenic Compounds (ASC)	0.0002	1.94E-05	3.88E-02	1.94E-05
Beryllium Compounds (BEC)	0.000012	1.16E-06	2.33E-03	1.16E-06
Cadmium Compounds (CDC)	0.0011	1.07E-04	0.21	1.07E-04
Chromium Compounds (CRC)	0.0014	1.36E-04	0.27	1.36E-04
Cobalt Compounds (COC)	0.000084	8.15E-06	1.63E-02	8.15E-06
Manganese Compounds (MNC)	0.00038	3.69E-05	7.38E-02	3.69E-05
Mercury Compounds (HGC)	0.00026	2.52E-05	5.05E-02	2.52E-05
Nickel Compounds (NIC)	0.0021	2.04E-04	0.41	2.04E-04
Selenium Compounds (SEC)	0.000024	2.33E-06	4.66E-03	2.33E-06
Total HAPs	1.81	0.1760	352.02	0.18

[1] Emission Factors from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98)
Conversion Factor: 1 MMscf ~ 1020 MMBtu

Greenhouse Gases	(kg/MMBtu) [1]	(tons/yr) [2]	(tons/yr) [3]
Carbon Dioxide	53.06	34742.43	11580.81
Methane	0.001	0.65	0.22
Nitrous Oxides	0.0001	6.55E-02	2.18E-02
Total GHGs (mass basis)		34743.15	11581.05
Total GHGs (CO2e equivalent) [4]		34776.48	11592.16

[1] All emission factors are default values from 40 CFR 98 Tables C-1 and C-2. This PTE summary follows the methodologies prescribed in 40 CFR Part 98.

[2] GHG (tons/yr) = [Emission Factor (kg/MMBtu)] x (Potential Heat Input Capacity MMBtu/hr)*(6,000 hrs/yr)]/(907.18 kg/tons)
[3] GHG (tons/yr) = [Emission Factor (kg/MMBtu)] x (Potential Heat Input Capacity MMBtu/hr)*(2,000 hrs/yr)]/(907.18 kg/tons)

[4] tons CO_2e/yr = [(tons/yr CO_2)*1]+[(tons/yr CH_4)*21] + [(tons/yr N_2O)*310]; CO2 equivalents are found in 40 CFR Part 98 Subpart A Table A-1 Global Warming Potentials published on October 30, 2009 (Title 129, Chapter 1). The CO_2e for CO2 =1, for CH_4 =21, and for N_2O = 310.

Fact Sheet Attachment: Liquid Loadout

Emission Point ID Number SV009

Potential to Emit Calculations for Emissions associated with Liquid Loadout

Anhydrous Ethanol Loading Rat	78.008	MMgal/yr
Denaturant Loading Rate:	2.5	MMgal/yr
Denatured Ethanol Loading Rate	80.51	MMgal/yr

Material Physical Data

	Gasoline	Ethanol	Denaturant
Molecular weight (M, lbs/lbs-mo	66	46	66
Temperature (T, deg R)[a]	510	510	510
Vapor pressure (P, psia)	4.73	1.27	4.73
Liquid molecular weight (ML)	92	46	92
Density (D, lb/gal)	5.6	6.6	5.6
Liquid Mole Fraction (X)[b]	N/A	0.99	0.01

[a]Temperature from the annual average ambient temperature from TANKS 4.0 for Norfolk, NE

[b]Liquid Mole Fraction (X) was calculated as follows, where V = loading rate:

$$X = \frac{\left(\frac{V*2}{ML}\right)}{\left(\frac{D_{ethanol}*V_{ethanol}}{ML_{ethanol}}\right) + \left(\frac{D_{denaturant}*V_{denaturant}}{ML_{denaturant}}\right)}$$

Hazardous Air Pollutant Weight Fractions

Individual HAPs	Weight Fraction of VOC Emissions		
	Gasoline	Ethanol	Denaturant
Acetaldehyde	N/A	2.00E-04	N/A
Benzene	2.50E-03	N/A	2.50E-03
Carbon disulfide	2.00E-05	N/A	2.00E-05
Cumene	1.00E-04	N/A	1.00E-04
Ethyl benzene	5.00E-05	N/A	5.00E-05
n-Hexane	5.00E-02	N/A	5.00E-02
Methanol	N/A	2.00E-04	N/A
Toluene	5.00E-03	N/A	5.00E-03
Xylene	5.00E-04	N/A	5.00E-04
Total HAPs	5.82E-02	4.00E-04	5.82E-02

Control Efficiency

	Truck loadout
Capture efficiency:	99.0%
Control efficiency:	99.0%
Overall control efficiency:	98.0%

Saturation Factors

$S_{normal\ dedicated,\ submerged\ loading}$	0.6	Saturation factor
$S_{clean\ cargo,\ submerged\ loading}$	0.5	Saturation factor

Truck loadout is assumed to be non-dedicated trucks, which previous load was unleaded gasoline.
The gasoline vapors are assumed to be displaced by the ethanol, for worst-case assumption.
Rail loadout is assumed to be in dedicated railcars, which previous load was denatured ethanol.

VOC Emissions

Denatured Ethanol Emission Factor Calculations

	Truck Loadout Uncontrolled * Emission Factor (lbs VOC/Mgal)
$EF_{gasoline}$	0.763
$EF_{ethanol}$	0.704
$EF_{denaturant}$	0.051
EF_{VOC}	1.518

* VOC emission factor equation from AP-42, Section 5.2.2 - Loading Losses (1/1995); EF = 12.46*S*P*M/T*[1-eff/100]/X = lbs/Mgal per component; EFgasoline emission factors assumes S =Snormal - Sclean cargo and do not use the Liquid Mole Fraction (X) in the equations.

Fact Sheet Attachment: Liquid Loadout (continued)

Emission Point ID Number SV009

Potential to Emit Calculations for Emissions associated with Liquid Loadout

Individual Component Emission Calculations

Loadout Type/Material	(A) Denatured Ethanol Produced (Mgal/year)	(B) Uncontrolled Emission Factor (lbs VOC/Mgal)	(C)=(A)x(B)/2000 Uncontrolled VOC Emissions (tons/year)	(D) Overall Control Efficiency (%)	(E)=(C)*[1-(D)] Controlled VOC Emissions (tons/year)
Truck Loadout	80,508.00				
Gasoline		0.763	30.702	98.0%	0.611
Ethanol		0.704	28.342	98.0%	0.564
Denaturant		0.051	2.059	98.0%	0.041

Total VOC Emission Calculations from Denatured Ethanol Loadout

Loadout Type	(A) Denatured Ethanol Produced (Mgal/year)	(B) Uncontrolled Emission Factor (lbs VOC/Mgal)	(C)=(A)x(B)/2000 Uncontrolled VOC Emissions (tons/year)	(D) Overall Control Efficiency (%)	(E)=(C)*[1-(D)] Controlled VOC Emissions (tons/year)
Truck Loadout	80,508.00	1.518	61.102	98.0%	1.216

Maximum Uncontrolled VOC Emissions from Denatured Ethanol Loadout:	61.10	tons/year
Maximum Controlled VOC Emissions from Denatured Ethanol Loadout:	1.22	tons/year

Uncontrolled Hazardous Air Pollutant Emissions

Hazardous Air Pollutant	Truck Loadout			Maximum Uncontrolled HAP Emissions (tons/year)
	Gasoline	Ethanol	Denaturant	
Acetaldehyde	N/A	0.0057	N/A	0.0057
Benzene	0.0768	N/A	0.0051	0.0819
Carbon disulfide	0.0006	N/A	0.0000	0.0007
Cumene	0.0031	N/A	0.0002	0.0033
Ethyl benzene	0.0015	N/A	0.0001	0.0016
n-Hexane	1.5351	N/A	0.1030	1.6380
Methanol	N/A	0.0057	N/A	0.0057
Toluene	0.1535	N/A	0.0103	0.1638
Xylene	0.0154	N/A	0.0010	0.0164
Total HAPs	1.9170			1.9170

Controlled Hazardous Air Pollutant Emissions

Hazardous Air Pollutant	Truck Loadout			Maximum Controlled HAP Emissions (tons/year)
	Gasoline	Ethanol	Denaturant	
Acetaldehyde	N/A	1.13E-04	N/A	1.13E-04
Benzene	1.53E-03	N/A	1.02E-04	1.63E-03
Carbon disulfide	1.22E-05	N/A	8.20E-07	1.30E-05
Cumene	6.11E-05	N/A	4.10E-06	6.52E-05
Ethyl benzene	3.05E-05	N/A	2.05E-06	3.26E-05
n-Hexane	3.05E-02	N/A	2.05E-03	3.26E-02
Methanol	N/A	1.13E-04	N/A	1.13E-04
Toluene	3.05E-03	N/A	2.05E-04	3.26E-03
Xylene	3.05E-04	N/A	2.05E-05	3.26E-04
Total HAPs	3.81E-02			3.81E-02

Fact Sheet Attachment: Liquid Loadout Flare

Emission Point ID Number SV009

Potential to Emit Calculations for Emissions from the Liquid Loadout Flare

Flaring Emissions

Denatured Ethanol Produced	9,132.4	gallons/hour
Flare Heat Input Capacity	2.5	MMBtu/hr
Operating Time	8760	hr/yr

Pollutant	(A) Emission Factor[1] (lb/gallon)	(B) = (A)x MMBtu/hr Potential Emission Rate (lbs/hr)	(C) = (B)xOT Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Particulate Matter (PM)	Negligible, Smokeless Design			
Particulate Matter (PM_{10})	Negligible, Smokeless Design			
Nitrogen Oxides (NO_x)	0.000077	0.7032	6160.00	3.0800
Sulfur Dioxide (SO_2)	0.000001	0.0091	80.00	4.00E-02
Carbon Monoxide (CO)	0.000129	1.1781	10320.00	5.1600
Volatile Organic Compounds (VOC)[2]	0.0521	0.1303	1140.99	0.5705

[1]Emission Factors provided by source via Plant Designer

[2]Emission Factor for Waste Gas from AP-42 Tables 13.5-1 and 13.5-2 (10/91) in lb/MMBtu

Pilot Emissions

Total Heat Input Capacity of Pilot	0.1	MMBtu/hr
Heating Value	1020	Btu/scf
Operating Time	8760	hr/yr
Total Natural Gas Usage	0.000098	MMscf/hr

Pollutant	(A) Emission Factor[1] (lb/MMscf)	(B) = (A)x MMscf/hr Potential Emission Rate (lbs/hr)	(C) = (B)xOT Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Particulate Matter (PM)	7.6	7.45E-04	6.5271	3.26E-03
Particulate Matter (PM_{10})	7.6	0.0007	6.5271	3.26E-03
Nitrogen Oxides (NO_x)	100	0.0098	85.8824	4.29E-02
Sulfur Dioxide (SO_2)	0.6	0.0001	0.5153	2.58E-04
Carbon Monoxide (CO)	84	0.0082	72.1412	3.61E-02
Volatile Organic Compounds (VOC)	5.5	0.0005	4.7235	2.36E-03

[1]Emission Factors from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98)

Total Flare Emissions

Pollutant	Total Potential Emission Rate (tons/year)
Particulate Matter (PM)	3.26E-03
Particulate Matter (PM_{10})	3.26E-03
Nitrogen Oxides (NO_x)	3.1229
Sulfur Dioxide (SO_2)	4.03E-02
Carbon Monoxide (CO)	5.1961
Volatile Organic Compounds (VOC)	0.5729

Fact Sheet Attachment: Internal Combustion Unit

Emission Point ID# SV016

Unit ID# EUFIREPUMP
Unit Description: One (1) 600 hp Emergency Fire Pump

Potential to Emit from Combusting Diesel Fuel by Internal Combustion for Units GREATER THAN 600hp or 447KW or 4.2 MMBtu/hr

Horsepower Rating	600	HP		
Total Heat Input Capacity	4.20	MMBtu/hr		
Heat Content	137,000	BTU/gallon		
Potential Fuel Usage	30.66	gallons/hr =	268,554.74	gallons/year
Diesel Fuel Sulfur Limit	0.5	wt % sulfur		
Limited Operating Time (OT)	500.00	hours/year		
Limited Diesel Fuel Throughput	30.66	gallons/hr =	15,328	gallons/year

Pollutant	(A) Emission Factor[1] (lb/MMBtu)	(B) = (A) x MMBtu/hr Emission Rate (lbs/hr)		(C) = (B) x OT Emission Rate (lbs/year)		(D) = (C)/2000 Emission Rate (tons/year)	
		Potential	Limited	Potential	Limited	Potential	Limited
Particulate Matter (PM)	0.1	0.42	0.42	3,679.20	210.00	1.84	0.11
Particulate Matter (PM_{10})	0.1	0.42	0.42	3,679.20	210.00	1.84	0.11
Nitrogen Oxides (NO_x)	3.2	13.44	13.44	117,734.40	6,720.00	58.87	3.36
Sulfur Dioxide (SO_2)	0.505	2.12	2.12	18,579.96	1,060.50	9.29	0.53
Carbon Monoxide (CO)	0.85	3.57	3.57	31,273.20	1,785.00	15.64	0.89
Volatile Organic Compounds (VOC)	0.0819	0.34	0.34	3,013.26	171.99	1.51	8.60E-02
Individual Hazardous Air Pollutants (HAP)							
Acetaldehyde	2.52E-05	1.06E-04	1.06E-04	9.27E-01	0.05	4.64E-04	2.65E-05
Acrolein	7.88E-06	3.31E-05	3.31E-05	2.90E-01	0.02	1.45E-04	8.27E-06
Benzene	7.76E-04	3.26E-03	3.26E-03	2.86E+01	1.63	1.43E-02	8.15E-04
Formaldehyde	7.89E-05	3.31E-04	3.31E-04	2.90E+00	0.17	1.45E-03	8.28E-05
Naphthalene	1.30E-04	5.46E-04	5.46E-04	4.78E+00	0.27	2.39E-03	1.37E-04
Toluene	2.81E-04	1.18E-03	1.18E-03	1.03E+01	0.59	5.17E-03	2.95E-04
Xylene	1.93E-04	8.11E-04	8.11E-04	7.10E+00	0.41	3.55E-03	2.03E-04
Total HAPs	1.49E-03	6.27E-03	0.01	5.49E+01	3.13	2.74E-02	1.57E-03

[1]Emission Factors are from AP-42 Tables 3.4-1, 3.4-2, 3.4-4 (10/96)

Conversion Factor: Heat Capacity of Diesel Fuel is 137,000 Btu/gal (AP-42 Appendix A)

Note: Operating Time for Potential is 8760 hours

Fact Sheet Attachment: External Combustion Units

Emission Point ID Number(s) SV010A and SV010B

Unit Description: Two (2) 92.4 MMBtu/hr rated Boilers

Potential to Emit from Combusting Natural Gas by External Combustion

Total Heat Input Capacity	184.8	MMBtu/hr
Potential Natural Gas Throughput	0.1812	MMscf/hr
	1587.1	MMscf/yr

Pollutant	(A) Emission Factor[1] (lb/MMBtu)	(B) = (A)x MMscf/hr Potential Emission Rate[2] (lbs/hr)	(C) = (B)x8760 Potential Emission Rate (lbs/year)	(D) = (C)/2000 Potential Emission Rate (tons/year)
Particulate Matter (PM)	-	1.40	12,264	6.13
Particulate Matter (PM_{10})	-	1.40	12,264	6.13
Nitrogen Oxides (NO_x)	-	9.42	82,519	41.26
Sulfur Dioxide (SO_2)	-	0.40	3,504	1.75
Carbon Monoxide (CO)	-	9.24	80,942	40.47
Volatile Organic Compounds (VOC)	-	1.02	8,935	4.47
Individual Hazardous Air Pollutants (HAP)	**(lb/MMscf)**			
Benzene	0.0021	3.80E-04	3.33	1.67E-03
Dichlorobenzene	0.0012	2.17E-04	1.90	9.52E-04
Formaldehyde	0.075	1.36E-02	119.03	5.95E-02
Hexane	1.8	3.26E-01	2856.79	1.43
Lead Compounds	0.0005	9.06E-05	0.79	3.97E-04
Naphthalene	0.00061	1.11E-04	0.97	4.84E-04
Polycyclic Organic Matter (POM)	0.0000882	1.60E-05	0.14	7.00E-05
Toluene	0.0034	6.16E-04	5.40	2.70E-03
Arsenic Compounds (ASC)	0.0002	3.62E-05	0.32	1.59E-04
Beryllium Compounds (BEC)	0.000012	2.17E-06	1.90E-02	9.52E-06
Cadmium Compounds (CDC)	0.0011	1.99E-04	1.75	8.73E-04
Chromium Compounds (CRC)	0.0014	2.54E-04	2.22	1.11E-03
Cobalt Compounds (COC)	0.000084	1.52E-05	0.13	6.67E-05
Manganese Compounds (MNC)	0.00038	6.88E-05	0.60	3.02E-04
Mercury Compounds (HGC)	0.00026	4.71E-05	0.41	2.06E-04
Nickel Compounds (NIC)	0.0021	3.80E-04	3.33	1.67E-03
Selenium Compounds (SEC)	0.000024	4.35E-06	3.81E-02	1.90E-05
Total HAPs	-	0.3421	2997.18	1.4986

Conversion Factor: 1 MMscf = 1020 MMBtu

[1]Emission Factors for HAPs are from AP-42 Tables 1.4-1, 1.4-2, 1.4-3, and 1.4-4 (7/98)

[2] Emission factors (lb/hr) for SV010A and SV010B for PM, PM_{10}, SO_2, NO_x, CO, and VOC are based on facility requested permit limits.

Fact Sheet Attachment: Cooling Tower Emissions

Potential to Emit Calculations for Emissions from Cooling Tower

Potential to Emit Calculations for Emissions from the 5 Cell - Cooling Tower (EUCOOLINGTOWER)

Circulation rate:	1,800,000	gal/hr
	15,768,000	Mgal/yr (based on 8,760 hrs/yr)
Drift loss percent:	0.005	
Water density:	8.34	lb/gal
TDS concentration:	2,750	ppm single sample event
	2,750	ppm average annual rate

Emission Factor Calculation for PM and PM_{10}

Emission factor equation from AP-42, Section 13.4-2 (01/1995)

PM/PM_{10} emission factor = $\left(\frac{ppmTDS}{1{,}000{,}000\,lbswater}\right)\left(\frac{8.34\,lbs}{gal}\,water\right)\left(\frac{1{,}000\,gal}{1Mgal}\right)\left(\frac{0.005}{100}\,driftloss\right)$

0.00114675	lb/Mgal single sample event (highest hourly rate)
0.00114675	lb/Mgal average annual rate

Hourly Emissions = (lb/Mgal single sample event)(hourly throughput gal/hr)(1 Mgal/1,000 gal)
Annual Emissions = (lb/Mgal average annual rate)(annual throughput Mgal/yr)/(2,000 lbs/ton)

Cooling Tower Emission Summary		
Pollutant	Hourly PTE (lb/hr)	Annual PTE (ton/year)
PM	2.064	9.041
PM_{10}	1.135	4.973

Note: PM_{10} Fraction is assumed to be 55% of the PM

Fact Sheet Attachment: Solid Product Loadout

Potential to Emit Calculations for Solid Product Loadout of Wet Distilled Grain Solids

Potential to Emit Calculations for Emissions from WDGS Loadout

Maximum amount of WDGS produced[1]	390,040	tons/year
	44.53	tons/hour

[1] Submitted by source in the OP application

Pollutant	(A) Emission Factor[1] (lb/ton WDGS)	Potential Emission Rate	
		(B) = (A)x ton WDGS/hr (lb/hr)	(C) = (B)x8760/2000 (ton/yr)
Volatile Organic Compounds (VOC)	0.0083	3.70E-01	1.62E+00
Individual Hazardous Air Pollutants (HAP)			
Acetaldehyde	1.11E-04	4.94E-03	2.16E-02
Acrolein	1.67E-05	7.44E-04	3.26E-03
Formaldehyde	2.22E-04	9.88E-03	4.33E-02
Methanol	4.44E-05	1.98E-03	8.66E-03
Total HAPs	-	1.75E-02	7.69E-02

[1] Emission Factors from DENCO stack test

Note: Maximum amount of WDGS produced was provided by Sandhills Renewable Energy, LLC with this permitting action

Fact Sheet Attachment: Paved Haul Roads - DDGS

PTE Calculation For Truck Traffic On Haul Roads

Rev. 12/2008

Paved roads {Draft AP-42 Chapter 13.IV (8/08)}

Equation (2): (modified)

$$E = k \times \left(\frac{sL}{2}\right)^{0.8} \times \left(\frac{W}{3}\right)^{0.8} \times \left(1 - \frac{P}{4 \times 365}\right) \times \left(\frac{S}{30}\right)^{d}$$

	k	*d*
PM	0.12	0.3
PM_{10}	0.023	0.5

Unpaved roads {AP-42 Chapter 13.2.2 (12/03)}

Equation (1a): (modified)

$$E = k \times \left(\frac{sC}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \times \left(\frac{365 - P}{365}\right) \times \left(\frac{S}{30}\right)^{d} \times (1 - CE)$$

	k	*a*	*b*	*d*
PM	4.9	0.7	0.45	0.3
PM_{10}	1.5	0.9	0.45	0.5

Haul Road / Traffic Parameters

Activity / Road Description	Road Type / Silt Value		Roundtrip Length (feet)		Truck Weight (tons)			Ave. Speed (mph)	Unrestricted Maximum Throughput (units/yr)	Ave. Truck Capacity (units/truck)		Annual VMT
			empty	full	empty	full	Ave.					
Grain Receiving	p	2.75	1,162	2,160	15	40	31.3	15	815,009	25	ton	20,511
Denaturant Delivery	p	2.75	1,776	1,546	15	40	26.6	15	2,500,000	8,000	gallon	197
Chemical Delivery	p	2.75	1,332	1,990	15	40	30.0	15	1,200,000	8,000	gallon	94
Ethanol Haul Out	p	2.75	1,546	1,776	15	40	28.4	15	52,500,000	8,000	gallon	4,129
DDGS Haul Out	p	2.75	1,027	2,295	15	40	32.3	15	211,029	25	ton	5,311

Emission Calculations

	Emission Factors (lb/VMT)		Potential Emissions (tons/yr)	
	PM	PM_{10}	PM	PM_{10}
Grain Receiving	0.77	0.13	7.89	1.32
Denaturant Delivery	0.68	0.11	6.65E-02	1.11E-02
Chemical Delivery	0.74	0.12	3.51E-02	5.86E-03
Ethanol Haul Out	0.71	0.12	1.47	0.25
DDGS Haul Out	0.79	0.13	2.10	0.35
Total Annual Emissions:			**11.56**	**1.93**

Description of Constants/Variables

E: haul road emissions (lb/VMT)

k, d: dimensionless constants from Draft AP-42 Chapter 13.IV (paved)

k, a, b, c, d: dimensionless constants from AP-42 Tables 13.2.1-1 & 13.2.2-2 (unpaved)

sL: silt loading (g/m^2) of paved road surface

sC: silt content (%) of unpaved road surface

W: average vehicle weight (tons)

P: days/yr with at least 0.01" of precipitation

P = 90 default = 90

S: mean vehicle speed on road (mph) default = 30, minimum =15

CE: unpaved road, dust control efficiency

CE = 0 % default = 0%

VMT: vehicle miles traveled

Fact Sheet Attachment: Paved Haul Roads - WDGS

PTE Calculation For Truck Traffic On Haul Roads

Rev. 12/2008

Paved roads {Draft AP-42 Chapter 13.IV (8/08)}

Equation (2): (modified)

$$E = k \times \left(\frac{sL}{2}\right)^{0.8} \times \left(\frac{W}{3}\right)^{0.8} \times \left(1 - \frac{P}{4 \times 365}\right) \times \left(\frac{S}{30}\right)^{d}$$

	k	*d*
PM	0.12	0.3
PM_{10}	0.023	0.5

Unpaved roads {AP-42 Chapter 13.2.2 (12/03)}

Equation (1a): (modified)

$$E = k \times \left(\frac{sC}{12}\right)^{a} \times \left(\frac{W}{3}\right)^{b} \times \left(\frac{365 - P}{365}\right) \times \left(\frac{S}{30}\right)^{d} \times (1 - CE)$$

	k	*a*	*b*	*d*
PM	4.9	0.7	0.45	0.3
PM_{10}	1.5	0.9	0.45	0.5

Haul Road / Traffic Parameters

Activity / Road Description	Road Type / Silt Value		Roundtrip Length (feet)		Truck Weight (tons)			Ave. Speed (mph)	Unrestricted Maximum Throughput (units/yr)	Ave. Truck Capacity (units/truck)		Annual VMT
			empty	full	empty	full	Ave.					
Grain Receiving	p	2.75	1,162	2,160	15	40	31.3	15	815,009	25	ton	20,511
Denaturant Delivery	p	2.75	1,776	1,546	15	40	26.6	15	2,500,000	8,000	gallon	197
Chemical Delivery	p	2.75	1,332	1,990	15	40	30.0	15	1,200,000	8,000	gallon	94
Ethanol Haul Out	p	2.75	1,546	1,776	15	40	28.4	15	80,000,000	8,000	gallon	6,292
WDGS Haul Out	p	2.75	1,027	2,295	15	40	32.3	15	390,040	25	ton	9,816
DDGS Haul Out	p	2.75	1,027	2,295	15	40	32.3	15	0	25	ton	0

Emission Calculations

	Emission Factors (lb/VMT)		Potential Emissions (tons/yr)	
	PM	PM_{10}	PM	PM_{10}
Grain Receiving	0.77	0.13	7.89	1.32
Denaturant Delivery	0.68	0.11	6.65E-02	1.11E-02
Chemical Delivery	0.74	0.12	3.51E-02	5.86E-03
Ethanol Haul Out	0.71	0.12	2.24	0.37
WDGS Haul Out	0.79	0.13	3.87	0.65
Total Annual Emissions:			**14.11**	**2.35**

Description of Constants/Variables

E: haul road emissions (lb/VMT)

k, d: dimensionless constants from Draft AP-42 Chapter 13.IV (paved)

k, a, b, c, d: dimensionless constants from AP-42 Tables 13.2.1-1 & 13.2.2-2 (unpaved)

sL: silt loading (g/m^2) of paved road surface

sC: silt content (%) of unpaved road surface

W: average vehicle weight (tons)

P: days/yr with at least 0.01" of precipitation

P = 90 default = 90

S: mean vehicle speed on road (mph) default = 30, minimum =15

CE: unpaved road, dust control efficiency

CE = 0 % default = 0%

VMT: vehicle miles traveled

Fact Sheet Attachment: Equipment Leaks

Potential to Emit from Equipment Leaks

Process Area	Type of Component (Type of Service)	Number of Components[1]	Leaking Emission Factor[2] (kg/hr/source)	TOC Weight (%)	LDAR [2] (cont.eff. %)	VOC Emissions	
						(lb/hr)[3]	(ton/year)[4]
Fermentation	Valves (Light Liquid)	103	0.00403	0.13	84.00%	1.90E-02	8.34E-02
	Pumps (Light Liquid)	7	0.0199	0.13	69.00%	1.24E-02	5.42E-02
Distillation	Valves (Gas/Vapor)	12	0.00597	0.82	87.00%	1.68E-02	7.37E-02
	Valves (Light Liquid)	311	0.00403	0.82	84.00%	0.3625	1.5878
	Pumps (Light Liquid)	5	0.0199	0.82	69.00%	0.0558	0.2442
	PRV's (Gas Vapor)	13	0.104	0.82	87.00%	0.3177	1.3917
Tank Farm	Valves (Gas/Vapor)	0	0.00597	1.00	87.00%	0.0000	0.0000
	Valves (Light Liquid)	196	0.00403	1.00	84.00%	0.2786	1.2204
	Pumps (Light Liquid)	6	0.0199	1.00	69.00%	0.0816	0.3574
	PRV's (Gas Vapor)	12	0.104	1.00	87.00%	0.3577	1.5666
					Total VOC:	1.5022	6.5795

[1] Component counts are taken from the most recent NSPS Subpart VV equipment component count.

[2] VOC Emissions Factors and control efficiencies are from *Protocol for Equipment Leak Emission Estimates* , EPA-453/R-95-017, November 1995.

[3] VOC Emissions (lbs/hr) = (Number of Components)*(Emission Factor lb/hr/source)*(TOC Weight %)*(2.20462 lb/kg)(1- control efficiency)

[4] VOC Emissions (tons/yr) = (lb/hr)*(8760 hrs/yr)/(2000 lbs/ton)

Hazardous Air Pollutant	Weight Percent HAP in Product	HAP Emissions	
		lb/hr	ton/year
Acetaldehyde	0.0002	3.00E-04	1.32E-03
Acrolein	0.0002	3.00E-04	1.32E-03
Formaldehyde	0.0002	3.00E-04	1.32E-03
Methanol	0.0002	3.00E-04	1.32E-03
Total HAPs	-	1.20E-03	5.26E-03

Fact Sheet Attachment: Storage Tank Emissions

Potential to Emit Calculations for Emissions from the Storage Tanks

Product Code Definitions for the Table Below.
DE = Denatured ethanol (ethanol/gasoline blends - percentages can vary)
ET = Anhydrous ethanol
GA = natural gasoline (denaturant)
OT = Other

Storage Tanks VOC Emission Summary

Tank ID	Product Stored	Product Code	Size (gallons)	VOC (lbs/yr)	Amount of VOC from Ethanol (lbs/yr)	Amount of VOC from Denaturant (lbs/yr)
SV011	100% natural gasoline	GA	91,000	4,207.399	0.00	4,207.40
SV012	Denatured Ethanol (95/5)	DE	541,500	612.764	515.1295	97.6348
SV013	Denatured Ethanol (95/5)	DE	541,500	612.764	515.1295	97.6348
SV014	Ethanol Day Tank 1	ET	155,800	882.325	882.33	0
SV015	Ethanol Day Tank 2	ET	155,800	925.759	925.76	0
			Total lbs	7,241.01	2,838.34	4,402.67
			Total tons	3.62	1.42	2.20

HAP Composition of Ethanol & Denaturant (Gasoline)

Material	Pollutant	PPM	%	Fraction
Ethanol	Acetaldehyde	200		0.0002
Ethanol	Methanol	200		0.0002
Denaturant	Benzene		0.25	0.0025
Denaturant	Carbon disulfide		0.002	0.00002
Denaturant	Cumene		0.01	0.0001
Denaturant	Ethyl Benzene		0.005	0.00005
Denaturant	n-Hexane		5	0.05
Denaturant	Toluene		0.5	0.005
Denaturant	Xylenes		0.05	0.0005

Fact Sheet Attachment: Storage Tank Emissions

Potential to Emit Calculations for Emissions from the Storage Tanks

HAP Emissions = (Sum of VOC emissions from chemical) x (HAP fraction) = lbs/yr

Storage Tanks HAP Emission Summary

Chemical type	Hazardous Air Pollutant	HAP Fraction of VOC	HAP Emissions (lbs/year)
Denatured ethanol	Acetaldehyde	0.0002	0.2061
	Benzene	0.0025	2.5756
	Carbon disulfide	0.00002	2.06E-02
	Cumene	0.0001	0.1030
	Ethyl Benzene	0.00005	5.15E-02
	n-Hexane	0.05	51.5130
	Methanol	0.0002	0.2061
	Toluene	0.005	5.1513
	Xylenes	0.0005	0.5151
Anhydrous ethanol	Acetaldehyde	0.0002	0.3616
	Methanol	0.0002	0.3616
Denaturant (100% natural gasoline)	Benzene	0.0025	10.5185
	Carbon disulfide	0.00002	8.41E-02
	Cumene	0.0001	0.4207
	Ethyl Benzene	0.00005	0.2104
	n-Hexane	0.05	210.3700
	Toluene	0.005	21.0370
	Xylenes	0.0005	2.1037

Total Emissions from Storage Tanks

Pollutant	Potential Annual Emissions (tons/yr)
VOC	3.621
Individual HAPs	
Acetaldehyde	2.84E-04
Benzene	6.55E-03
Carbon disulfide	5.24E-05
Cumene	2.62E-04
Ethyl Benzene	1.31E-04
n-Hexane	0.13
Methanol	2.84E-04
Toluene	1.31E-02
Total HAPs	0.15

Fact Sheet Attachment: Facility Wide Emissions assuming 100% WDGS Loadout

Facility Wide Emissions assuming 100% WDGS

Facility Wide Pollutant Emissions as Limited by the Permit

Process or Unit	Pollutants					
	Particulate Matter (PM)	Particulate Matter (PM_{10})	Nitrogen Oxides (NO_x)	Sulfur Oxides (SO_x)	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)
Grain Handling, Storage, Cleaning, and Milling	29.43	11.73	-	-	-	-
Fermentation Scrubber	1.01	1.01	-	-	-	67.89
Thermal Oxidizer	Assuming only WDGS is produced					
Liquid Loadout	-	-	-	-	-	1.22
Loadout Flare	0.003	0.003	3.12	0.0403	5.20	0.57
Emergency Generator[1]	-	-	-	-	-	-
Emergency Fire Pump	0.11	0.11	3.36	0.53	0.89	0.09
Boilers	6.13	6.13	41.26	1.75	40.47	4.47
Cooling Tower	9.04	4.97	-	-	-	-
WDGS Loadout	-	-	-	-	-	1.62
Paved Haul Roads - DDGS	Assuming only WDGS is produced					
Paved Haul Roads - WDGS	10.75	1.79	-	-	-	-
Equipment Leaks	-	-	-	-	-	6.58
Tanks	-	-	-	-	-	3.62
Facility-Wide Emissions as limited by the Permit	56.47	25.74	47.74	2.32	46.56	86.05

[1] Removed from PTE calculations as part of this permitting action.

Fact Sheet Attachment: Facility Wide Emissions assuming 100% WDGS Loadout

Facility Wide Emissions assuming 100% WDGS

Facility Wide Hazardous Air Pollutant Emissions as Limited by the Permit

Hazardous Air Pollutant	Process or Unit								HAP Totals
	Fermentation Scrubber	WDGS Loadout	Liquid Loadout	Emergency Generator[1]	Emergency Fire Pump	Boilers	Equipment Leaks	Tanks	Estimated Actual
Acetaldehyde	8.103	2.16E-02	1.13E-04	-	2.65E-05	-	1.32E-03	2.84E-04	8.13E+00
Acrolein	0.92856	3.26E-03	-	-	8.27E-06	-	-	-	9.32E-01
Benzene	-	-	1.63E-03	-	8.15E-04	1.67E-03	-	6.55E-03	1.07E-02
Carbon disulfide	-	-	1.30E-05	-	-	-	-	5.24E-05	6.54E-05
Cumene	-	-	6.52E-05	-	-	-	-	2.62E-04	3.27E-04
Dichlorobenzene	-	-	-	-	-	9.52E-04	-	-	9.52E-04
Ethyl benzene	-	-	3.26E-05	-	-	-	-	1.31E-04	1.64E-04
Formaldehyde	2.80E-01	4.33E-02	-	-	8.28E-05	5.95E-02	-	-	3.83E-01
Hexane	-		3.26E-02	-	-	1.43E+00	-	1.31E-01	1.59E+00
Lead Compounds	-		-	-	-	3.97E-04	-	-	3.97E-04
Methanol	3.72E-01	8.66E-03	1.13E-04	-	-	-	1.32E-03	2.84E-04	3.83E-01
Naphthalene	-	-	-	-	1.37E-04	4.84E-04	-	-	6.21E-04
Polycyclic Organic Matter (POM)	-	-	-	-	-	7.00E-05	-	-	7.00E-05
Toluene	-	-	3.26E-03	-	2.95E-04	2.70E-03	-	1.31E-02	1.93E-02
Xylene	-	-	3.26E-04	-	2.03E-04	-	-	-	5.29E-04
Arsenic Compounds (ASC)	-	-	-	-	-	1.59E-04	-	-	1.59E-04
Beryllium Compounds (BEC)	-	-	-	-	-	9.52E-06	-	-	9.52E-06
Cadmium Compounds (CDC)	-	-	-	-	-	8.73E-04	-	-	8.73E-04
Chromium Compounds (CRC)	-	-	-	-	-	1.11E-03	-	-	1.11E-03
Cobalt Compounds (COC)	-	-	-	-	-	6.67E-05	-	-	6.67E-05
Manganese Compounds (MNC)	-	-	-	-	-	3.02E-04	-	-	3.02E-04
Mercury Compounds (HGC)	-	-	-	-	-	2.06E-04	-	-	2.06E-04
Nickel Compounds (NIC)	-	-	-	-	-	1.67E-03	-	-	1.67E-03
Selenium Compounds (SEC)	-	-	-	-	-	1.90E-05	-	-	1.90E-05
Total HAPS	9.68E+00	7.69E-02	3.81E-02	-	1.57E-03	1.50E+00	5.26E-03	1.52E-01	**11.45**

Fact Sheet Attachment

Title 129, Chapter 15 **Process Weight Rate**

For process weight rates up to 60,000 lbs/hr: $E= 4.10\ p^{0.67}$

For process weight rates in excess of 60,000 lbs/hr: $E= 55.0\ p^{0.11}-40$

where E = rate of emissions in lbs/hr PM and p = process weight rate in tons/hr.

$[C] = 4.10 \times [B]^{0.67}$ because [A] < 60,000 lbs/hr

Emission Point	Process Weight Rate (lbs/hr)	Process Weight Rate (tons/hr)	Ch. 20 PM Allowable (lbs/hr)[1]	PTE of PM (lbs/hr)
SV001B	840,000	420	66.89	0.77
SV002A	140,000	70	47.77	0.30
SV003A	56,000	28	38.23	0.17
SV003B	56,000	28	38.23	0.17
SV003C	56,000	28	38.23	0.17
SV003D	56,000	28	38.23	0.17
FS002	840,000	420	66.89	1.83
FS003	840,000	420	66.89	6.53
FS003C	130,200	65	47.07	6.53
FS005	560,000	280	62.22	0.26
FS008A	39,040	20	30.02	0.26

[1] Title 129, Chapter 15, Section 007, Table 20-2

Title 129, Chapter 15, Section 002
PM Limitations for Combustion Sources

Total Heat Input (MMBtu/hr)	Maximum Allowable Emissions of PM (lbs/MMBtu)
10 or less	0.6
Between 10 and 10,000	$1.026/I^{0.233}$
	Where I = total heat input in MMBtu/hr.
10,000 or more	0.12

Process equipment	MMBtu/hr	Allowable PM (lbs/MMBtu)	Unit PM emission rate (lbs/MMBtu)
SV007	99	0.35	3.69E-02
SV009[1]	2.5	0.60	2.98E-04
SV010A	92.4	0.36	1.52E-02
SV010B	92.4	0.36	1.52E-02

[1] The flare emits negligible PM due to smokeless design. Emissions are attributable to the pilot light