



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, ILLINOIS 60604**

SUBJECT: CLEAN AIR ACT INSPECTION REPORT
Ace Ethanol, Stanley, Wisconsin

FROM: Erin DuMontelle, Environmental Engineer
AECAB (MI/WI)

THRU: Sarah Marshall, Section Supervisor
AECAB (MI/WI)

TO: File

BASIC INFORMATION

Facility Name: Ace Ethanol LLC

Facility Location: 815 W. Maple Street, Stanley, Wisconsin 54768

Date of Inspection: April 19, 2023

EPA Inspector(s):

1. Erin DuMontelle, Environmental Engineer
2. Brittany Cobb, Environmental Engineer

Other Attendees:

1. Neil Kemmet, President and General Manager
2. Joe Fischer, Plant Manager

Contact Email Address: Joe Fischer – jfischer@aceethanol.com

Purpose of Inspection: Determine compliance with the Clean Air Act and their Title V Permit

Facility Type: Ethanol Production

Regulations Central to Inspection: WI SIP and 40 CFR Part 60 Subpart VVa – Standards of Performance Equipment Leaks of VOC in the Synthetic Organic Chemicals Manufacturing Industry

Arrival Time: 1:30 PM CDT

Departure Time: 5:04 PM CDT

Inspection Type:

- ☒ Unannounced Inspection
- ☐ Announced Inspection

OPENING CONFERENCE

- ☒ Presented Credentials
- ☒ Stated authority and purpose of inspection
- ☒ Small Business Resource Information Sheet not provided. Reason: the facility is not a small business
- ☒ Provided CBI warning to facility

The following information was obtained verbally from Joe Fischer or Neil Kemmet unless otherwise noted.

Company Ownership: The company has not changed ownership in the last 5 years.

Process Description:

Ace Ethanol LLC (Ace or facility) operates a main ethanol facility, a smaller “Cellulose Plant” that runs off byproducts from the main facility, and CO₂ plant.

Main Ethanol Facility

Corn bushels are brought onsite by truck and rail. The corn is conveyed to four silos and then sent to two hammermills where the corn is crushed into flour. The flour is then mixed with water in the wet milling tank. The mixture is sent to the cook tank, also known as the slurry tank, and then to three liquefaction tanks. In the liquefaction tanks, more water, yeast, ammonia, and sulfuric acid are added, the slurry is hydrolyzed and heated. The mash is pumped into one of seven fermenters. A portion of the CO₂ created in the fermentation process is sent to the CO₂ plant. From the fermenters, the mixture is sent to a high temperature distillation system. The distillation system includes the beer well, the stripper system and the molecular sieve. The distillation system separates the solids from the liquids and converts the mash into DDGS and 200-proof ethanol. The ethanol is mixed with a denaturant, that is brought in by truck and rail and stored at the tank farm. The final product is stored in one of two 500,000-gallon product tanks in the tank farm and shipped out by rail or truck. The loading is controlled by a flare. The flare is set to a temperature of 970^oF.

Half of the beer well bottoms mixture is sent to a centrifuge to further separate the liquids from the solids and the other half is sent to the Cellulose Plant. The liquid from the beer bottoms, or stillage bottoms, are sent to an evaporator to remove residual water and then to the oil distiller to create corn oil. The corn oil is shipped out as final product via truck. The solids from the stillage bottoms are sent to two dryers that are in series and then to a cool down drum to remove excess moisture and create dried distillers’ grains (DDGS) for cattle feed. The DDGS are shipped out by truck and rail.

Cellulose Plant

The Cellulose Plant uses between 45% and 50% of the stillage bottoms from the beer well. The process is run under the D3Max program that contains four fermenter tanks and one beer well. The purpose of the plant is to further remove ethanol from the stillage bottoms.

CO₂ Plant

CO₂ from the main scrubber is routed to the CO₂ plant. There is a second scrubber and two filter beds to further remove impurities from the CO₂ stream before it is compressed. The liquid CO₂ is then shipped offsite by truck.

Emission controls

There is a baghouse at the truck loading/unloading site that also connects to the storage bins (C10). There is a second baghouse that connects to both hammermills (C01). There is a final baghouse at the DDGS and corn loadout site (C11). There is a single vent gas scrubber (C20) that controls emissions from the slurry tank, the liquefaction tanks, and the distillation system. Emissions from the fermentation tanks go to the CO₂ scrubber (C22), and the beer well emissions are controlled by the Beerwell Scrubber (C21). All scrubbers have random packing and demisters. There is a regenerative thermal oxidizer (RTO) (C42) and two multiclones (C40 and C41) that control emissions from the vent stream of the scrubbers, the storage bin fans, the dryers, and the cooling drum. There is a separate scrubber (C23) for the Cellulose Plant that is also randomly packed; it does not vent to the RTO.

Staff Interview:

The facility was established as a Delta T plant in 2002 and began as a 15-million-gallon facility but expanded to a 40–50-million-gallon facility within the first year. The Cellulose Plant was installed in 2020, was shut down in December 2020, and then restarted in September 2021. The Cellulose Plant is a D3Max designed plant. The facility runs 365 days a year, with 350 days of full operations. There are 50 full time employees onsite. At one time, there are normally four operators in the control room; three oversee the main plant operations, and the fourth operates the D3Max system for the Cellulose Plant.

The facility processes 17 million bushels of corn per year. The combined capacity of the four silos is two million bushels.

The tank farm onsite contains two 55,000-gallon day tanks, one 55,000-gallon snuff/off-spec tank, two 500,000-gallon product tanks, and one 45,000-gallon denaturant tank.

The baghouses are serviced semi-annually and checked daily during rounds. Pressure drop on the scrubbers and baghouses is recorded every eight hours. The facility performs maintenance on the scrubbers annually. The RTO was stack tested in 2021. All scrubbers for the main plant were stack tested in 2019, and the D3 scrubber was stack tested in 2020. Method 21 testing is performed voluntarily each quarter on the top of the fermenters. Semi-annual and annual LDAR is performed by a contractor.

TOUR INFORMATION

EPA Tour of the Facility: Yes

Data Collected and Observations:

EPA observed the North and South baghouses, which control emissions from corn offloading. Joe Fischer purged both North and South lines of fluid before EPA took readings. The observed pressure drop reading for the North baghouse was 2.8 inches of water column (in. WC), and the South baghouse was 3.8 inches of WC. The pressure drop for hammermill bag house was 1.8 inches of WC.

EPA observed the following parameters in the operations control room: 37.9 gallons/min for the CO₂ scrubber, 0.725 gallons/min for the beer well, 1.19 gallons/min for the slurry tank, and 51.12 mL/min for the bisulfite tank. The pressure drop for the packing of each of the scrubbers read: 7.2-7.4 in. WC for the CO₂ scrubber packing, 0.0 inches for the Beerwell scrubber, 1.2 in. WC for the vent gas scrubber, and 1.2 in. WC for the DDG loadout. Joe Fischer stated that there is a vacuum from the RTO and very little fermentation at the Beerwell that caused the pressure drop value of the scrubber to be so low. EPA observed the temperature of the RTO was 1682 °F.

Most of the process for Ace ethanol is within warehouse buildings that have fans in the walls to help draw air out.

The FLIR GF 320 Optical Gas Imaging camera was used to detect leaks. The tops of the degasser tank and the yeast propagation tank were inspected. Large amounts of gas were seen coming from the top of the agitator on top of the degasser tank. The roof of the degasser tank was also felt structurally weak to the right of the access ladder. The tops of each of the fermenter tanks and the beer well were also inspected with the FLIR camera. No leaks were seen with the camera on the top of the beer well, fermenter #2, fermenter #3, fermenter #5, and fermenter #6. Leaks detected around the agitators of the degasser tank, fermenter #1, fermenter #4, and fermenter #7 were recorded by the FLIR camera.

In the Cellulose Plant, EPA observed the flow rate of the scrubber was 2.02 gallons/min and the pressure drop was 3.24 in. WC. FLIR footage was taken of the DC3 reactor.

The facility was not loading ethanol at the time of the tour.

Photos and/or Videos: were taken during the inspection.

Footage was taken with a FLIR GF320 Optical Gas Imaging camera. Review Appendix A: Digital Image Log.

CLOSING CONFERENCE

☒ Provided U.S. EPA point of contact to the facility

Requested documents:

- The size of the ammonia tank

- The size of the sulfuric acid tank
- The daily opacity readings from January 1, 2019- May 19, 2023
- SOP or description of the training required for conducting opacity readings
- The daily flare temperature log from January 1, 2019- May 19, 2023
- The manufacturer's operations and maintenance for the damper settings and requirements for the flare.
- Manufacturer operations and maintenance procedures for the drop pressures for each of the scrubbers for both the main plant and D3 plant
- Records of the water column for the hammermill baghouses from January 1, 2019- May 19, 2023
- Records for the pressure drop of the hammermill baghouse from January 1, 2019- May 19, 2023
- Records for the 2019 tests on the main plant scrubbers and the 2020 test for D3 plant
- Records for the RTO stack test in 2021
- Installation dates for each of the scrubbers and the RTO.
- Continuous Monitoring records for the RTO from January 1, 2019- May 19, 2023
- SDS for all additive chemicals onsite for both the main plant and D3 plant
- SDS for ammonia onsite
- SDS for sulfuric acid onsite
- Emissions reports of acetaldehyde and formaldehyde from S20, S21, and S22
- Records for last aldehyde compliance test at the facility
- Records of fuel type and usage by the plant per month from January 1, 2019- May 19, 2023
- Semiannual Subpart VVa reports for January 1, 2019- May 19, 2023
- Leak Log
- LDAR Components list: either in an Excel spreadsheet or Access database
- Makeup of the contents in the yeast propagation tank, beer well and the seven fermenter tanks and the reactions that are taking place in each.
- Copies of any maintenance or work orders completed for each of the agitators on the propagation tank, the beer well, and the seven fermenters from January 1, 2019- May 19, 2023

Concerns: Ace Ethanol was made aware of a large leak observed with the FLIR coming from the yeast propagation tank as well as issues with the structural stability of the tank's roof. There were additional leaks detected by the FLIR camera on agitators above the fermenter #1, fermenter #4, and fermenter #7 that the facility was made aware of.

DIGITAL SIGNATURES

Report Author: _____

 Digitally signed by ERIN
DUMONTELLE
Date: 2023.05.26 14:17:49
-05'00'

Section Supervisor: _____

SARAH
MARSHALL
 Digitally signed by SARAH
MARSHALL
Date: 2023.05.30 08:57:06 -05'00'

Facility Name: Ace Ethanol LLC
Facility Location: 815 W Maple Street, Stanley, WI
Date of Inspection: April 19, 2023

APPENDICES AND ATTACHMENTS

1. Appendix A: Digital Image Log

APPENDIX A: DIGITAL IMAGE LOG

1. Inspector Name: Erin DuMontelle	2. Archival Record Location: Region 5 Electronic Record Center
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Image Number	File Name	Date and Time (CDT)	Description of Image
1	MOV_3085.mp4	4/19/2023 3:15 PM	The agitator on roof of the degasser tank
2	MOV_3087.mp4	4/19/2023 3:17 PM	The top of the yeast propagation tank.
3	MOV_3088.mp4	4/19/2023 3:24 PM	The agitator on the roof of Fermenter #1
4	MOV_3089.mp4	4/19/2023 3:29 PM	The agitator on the roof of Fermenter #4
5	MOV_3091.mp4	4/19/2023 3:32 PM	The agitator on the roof of Fermenter #4
6	MOV_3092.mp4	4/19/2023 3:40 PM	The agitator on the roof of Fermenter #2
7	MOV_3093.mp4	4/19/2023 4:09 PM	The agitator on the roof of Fermenter #5
8	MOV_3094.mp4	4/19/2023 4:11 PM	The agitator on the roof of Fermenter #7
9	MOV_3095.mp4	4/19/2023 4:34 PM	The D3 reactor of the Cellulose Plant