

Nebraska Department of Environment and Energy (NDEE)

MEMORANDUM

To: File

From: Hillary Stoll

Date: April 14, 2021

RE: AltEn, LLC

NDEE ID: 84069

Program ID: WWF, PCS NE0137634

Subject: Site Visit Report (Wastewater Treatment System Only)

Summary of Site Visit and Information Acquired During Visit:

Jason Windhorst and Hillary Stoll (myself) arrived at the AltEn, LLC facility in Mead, Nebraska at about 10:30 AM on April 14, 2021. The weather was about 40 degrees Fahrenheit. Mr. Scott Tingelhoff and Mr. Ken Peterson were present at our arrival. We stated that we were conducting the routine site visit. At no time was access denied. The observations included in this memorandum are only those that are related to the facility's wastewater treatment system that they are currently pilot testing. Observations related to other aspects of the facility, including the wastewater lagoons, are included in a different memorandum. Mr. Ken Peterson provided the tour of the wastewater treatment system. After the tour, I spoke with Mr. Matt O'Brien, an engineer with AltEn, about the facility's wastewater treatment system. We signed out at the office and left at approximately 12:45 PM.

Observations Noted:

Mr. Ken Peterson provided a tour of AltEn's wastewater treatment system that is currently being pilot tested to determine its efficacy at treating wastewater from the three-celled industrial wastewater lagoon system. Wastewater is currently being pumped from the Southeast lagoon (final lagoon of the three-celled lagoon system) and treated through the facility's wastewater treatment system. The current operation of the treatment system includes a pre-clarifier tank where ferric chloride is added as a coagulant. Following the pre-clarifier tank, a polymer is injected into the pipe transporting the water to the clarifier. Following clarification, the wastewater overflows the weirs into an upflow sand filter. The pre-clarifier tank, the clarifier, and the first sand filter are all existing structures that were part of the nutrient recovery system constructed in 2006. Following the initial sand filter, the water flows to a new sand filter, and then to two coconut carbon filters. This process occurs in series. The new sand filter and two coconut carbon filters were added recently to help treat lagoon wastewater and remove pesticides and other contaminants. The water used to backwash both the sand and carbon filters is treated lagoon wastewater and not well water. Following the final treatment step in the carbon filter, the



treated water is currently being stored in the beerwells/fermenters. I spoke with Mr. Matt O'Brien after the tour provided by Mr. Ken Peterson to discuss the treatment system in more detail. According to Mr. O'Brien, the sand filter is designed to be backwashed when the pressure differential is 15 psig and the carbon filters are designed to be backwashed when the pressure differential is 2 psig. According to Mr. O'Brien, they are currently backwashing the filters manually at the end of the day instead of relying on the pressure differential due to some technical issues when relying on the pressure differential. Mr. O'Brien is taking Total Suspended Solids (TSS) samples daily to monitor treatment and the efficacy of each unit process. I asked Mr. O'Brien what they are doing with the solids in the clarifier, and he said that they are pumping the solids slurry back to the three-celled wastewater lagoon system. He said the solid slurry from the clarifier is about 3-4% solids. He also said that they are currently treating wastewater through their system at a rate of about 200 gallons per minute (gpm). He said they were treating at a rate of 100 gpm originally, but decided to increase the rate of treatment. A flow rate of 200 gpm is still below the capacity of the treatment system. Following treatment, the water is being pumped into a surge tank and is then being stored in the beerwell/fermentation tanks. Following treatment in AltEn's system, the water is being pumped into Clean Harbors' portable treatment units (PTUs) and then into a Poseidon tank for storage and testing. According to Mr. O'Brien, Clean Harbors' PTUs are similar to AltEn's treatment system, and they involve clarification, sand filtration, clay filtration, and a five-carbon filter. I asked Mr. O'Brien if they have had any issues with fouling of the carbon filters. He said that he is not aware of any issues with that, but that they were having some foaming issues in the carbon filters. He thinks this was caused by the polymer that is added prior to clarification. Therefore, they have been adding an anti-foaming agent, which he said is helping. I asked him if they have been collecting Total Organic Carbon (TOC) samples to help monitor loading into the carbon filters and the efficacy of the filters. He said that they did take a sample of raw lagoon wastewater at one point and the TOC was about 1900 mg/L. Mr. O'Brien said that he thinks this was high due to solids content and wants to obtain another sample. He said that they have not analyzed samples for TOC recently, but might try to do that again soon. He said that the carbon filters can adsorb about 10% of their weight. There are 20,000 pounds of coconut carbon in each of the two carbon filters.

Shortly after our arrival at the facility, prior to the conversation with Mr. O'Brien, Mr. Scott Tingelhoff mentioned that the treated water stored in the beerwell/fermentation tanks is turning septic due to the lack of oxygen in the tanks. Therefore, Ken Peterson would like to oxygenate the tanks. Mr. Scott Tingelhoff was not available during the tour of the treatment system or the discussion with Mr. O'Brien following the tour.

Note: I had some additional questions for Matt O'Brien on April 15, 2021. Therefore, I called him and spoke with him on the phone. That conversation is described in another memorandum (attached), which provides additional information about the wastewater treatment system.

Attachments

- 1) Photos**
- 2) AltEn's Wastewater Treatment System Diagram**
- 3) Phone Call Memorandum, Dated April 15, 2021**

1) Photos

Note: Not all photos taken at the site are included in this memorandum.



Photo 1

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Pre-clarifier tank where ferric chloride is added to the raw wastewater (first step in the treatment process).



Photo 2

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Ferric chloride chemical tank, for addition to the pre-clarififier tank.

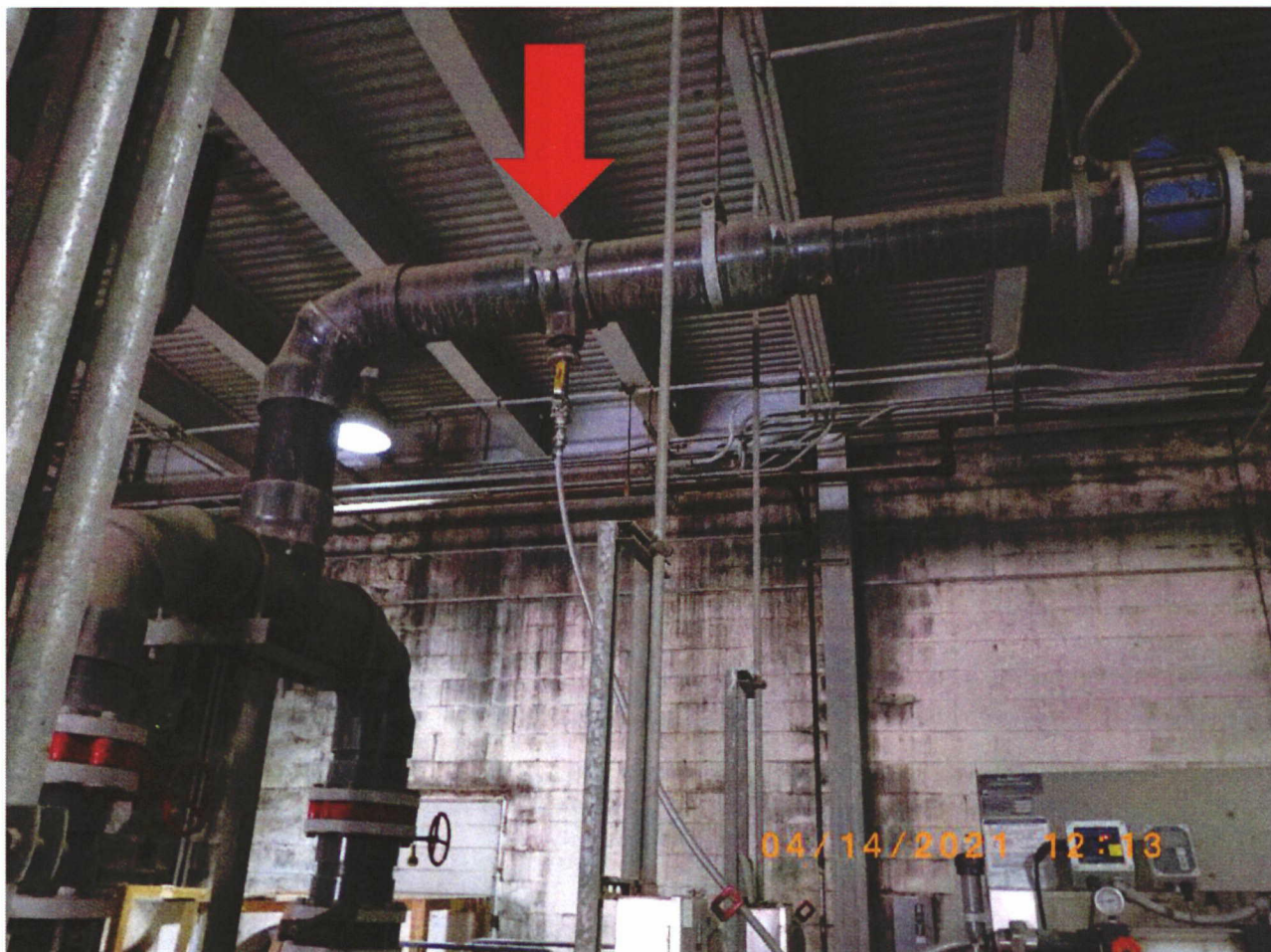


Photo 3

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Injection of polymer into pipe transporting wastewater from the pre-clarifler to the clarifier.



Photo 4

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Pre-clarifier to clarifier pipe.



Photo 5

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Clarifier (second step in the treatment process).

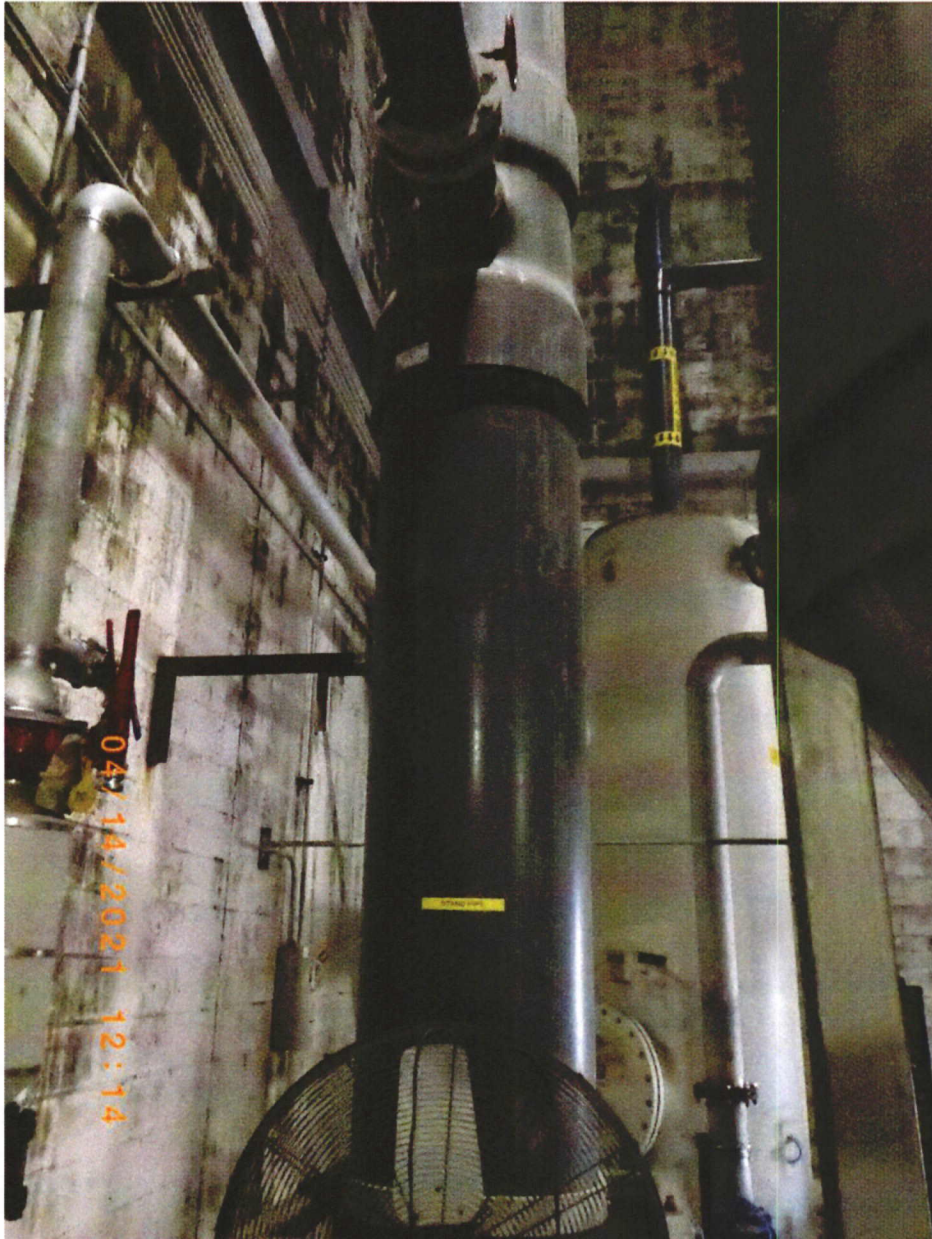


Photo 6

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Standpipe following the clarifier, prior to the first sand filter.



Photo 7

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Parkson upflow sand filter (first sand filter in the treatment process, third step of the treatment process).



Photo 8

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Filtered effluent tank (following the sand filter).



Photo 9

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: Second sand filter (green tank). This is the fourth step in the treatment process. Water flows from the filtered effluent tank into this filter. The blue tanks in front are not currently in use, but are additional, unused filters.



Photo 10

Date Taken: April 14, 2021

Photographer: Hillary Stoll

Facility Name/Project Name: AltEn, LLC, Mead, NE

Facility IIS number/Project Identifier: IIS #84069, PCS NE0137634

Direction Facing: N/A

Description: First (right) and second (partly shown left) carbon filters, which are operated in series following sand filtration. These are the fifth and sixth steps in the treatment process. The second carbon filter (partly shown left) is the final step in AltEn's wastewater treatment system and is identical to the first carbon filter (right).

2) AltEn's Wastewater Treatment System General Layout

