

BEFORE THE NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY

IN THE MATTER OF)

BIG OX ENERGY – SIOUXLAND, LLC,)

CASE NO. 3406

A Foreign LLC authorized to do business)

In Nebraska,)

Facility IC 105921,)

Respondent.)

I. INTRODUCTION

1. The Nebraska Department of Environmental Quality (Department) and Big Ox Energy – Siouxland, LLC (Big Ox) voluntarily enter into this Consent Order to incorporate and implement corresponding improvements to monitoring and environmental management controls at the Big Ox facility. This Consent Order requires Big Ox to comply with the activities and schedules specified in Section VII (Compliance Order and Schedule) below, which are intended to ensure Big Ox is in full compliance with air and water permits issued under the Nebraska Environmental Protection Act (the “Act”), Neb. Rev. Stat. §81-1501, et seq. (Reissue 2014). The Department and Big Ox agree that settlement of this matter is in the public interest because it ensures compliance with state laws, rules and regulations, and permits that have been adopted and issued to protect the environment. The Department and Big Ox consent to the entry of this Consent Order without any adjudication of fact or issues.

II. JURISDICTION

2. The Department is the agency of the State of Nebraska charged with the duty pursuant to Neb. Rev. Stat. §81-1504(1) and (4) of exercising exclusive general supervision of the administration and enforcement of the Act and all permits, rules and regulations and orders promulgated under the Act, and acting as the state water and air pollution control



agency for all purposes of the Federal Clean Water Act and Clean Air Act. This Consent Order is issued under the authority vested in the director of the Department by Neb. Rev. Stat. §81-1504(7) and §81-1507(1).

3. Big Ox is a foreign domesticated LLC that is qualified and in good standing to do business in Nebraska and which owns and operates a biologically-based, renewable natural gas production facility located in Dakota City, Nebraska. Big Ox agrees to undertake all actions required by the terms and condition of this Consent Order. Big Ox admits to the Department's jurisdiction over the subject matter of this Consent Order. Big Ox further agrees to and shall not challenge the jurisdictional allegations of this Consent Order or the Department's authority to issue and enforce this Consent Order. Big Ox waives its right to receive a formal complaint and to hearing requirements as provided in Neb. Rev. Stat. §81-1507(2). Big Ox agrees it will not contest the basis or validity of this Consent Order in any proceeding by the Department to enforce this Consent Order.

III. PARTIES

4. The parties to this Consent Order are the Department and Big Ox, and their employees, successors, and assigns. Big Ox shall ensure that all contractors hired to perform work required by this Consent Order are informed of applicable requirements.

IV. STATUTORY AND REGULATORY FRAMEWORK

5. Pursuant to Neb. Rev. Stat. §81-1505, the Environmental Quality Council (EQC) has adopted performance and pretreatment standards for the discharge of pollutants in Title 119 – Rules and Regulations Pertaining to the Issuance of Permits under the National Pollutant Discharge Elimination System.

6. Pursuant to Neb. Rev. Stat. §81-1505, the Environmental Quality Council (EQC) has adopted requirements for construction and installation of wastewater treatment works or disposal systems and necessary proper operation and maintenance thereof in Title 123 – Rules and Regulations for the Design, Operation and Maintenance of Wastewater Works.
7. Pursuant to Neb. Rev. Stat. §81-1505, the Environmental Quality Council (EQC) has adopted regulations for air pollution control including air construction and operating permits in Title 129 – Nebraska Air Quality Regulations.
8. Neb. Rev. Stat. §81-1506(1) makes it unlawful for any person to cause pollution of any air, water, or land of the state or to place or cause to be placed any wastes in a location where they are likely to cause pollution.
9. Neb. Rev. Stat. §81-1506(2)(d) makes it unlawful for any person to operate any industrial facility in a manner that would cause an increase in the discharge or emission of wastes into the air, waters, or land of the state or would otherwise cause an alteration of the physical, chemical, or biological properties of any air, waters, or land of the state in a manner that is not lawfully authorized.
10. Neb. Rev. Stat. §81-1506(4)(b) makes it unlawful for any person to violate any term or condition of an air pollution permit or any emission limit set in the permit.
11. Big Ox neither admits nor denies the statutory and regulatory basis for this Consent Order, but agrees not to contest the expressed authority in any proceeding to enforce this Consent Order.

V. FACTUAL BACKGROUND

12. Big Ox is a “person” as defined in Neb. Rev. Stat. §81-1502(10).

13. At all times relevant to this Consent Order, Big Ox has owned and operated a biologically-based renewable natural gas production facility located at 1616 D Avenue, Dakota City, Nebraska. Also referred to as a waste-to-energy facility, Big Ox processes industrial wastewater and organic wastes from surrounding industries through an anaerobic digester producing methane gas. Once fully operational Big Ox will scrub and compress the gas and convey it to an interstate natural gas transmission line.
14. Beginning on or about September 1, 2016, Big Ox began accepting industrial wastewater from the surrounding industries pursuant to its obligations under an agreement with South Sioux City, relying on South Sioux City's upstream and downstream wastewater collection system, which is partially regulated by the Department. Companies that sent industrial wastewater to the Big Ox facility were required to comply with the requirements of the law, which prohibits discharging wastewaters into the upstream sewer system with a pH less than the 5.5 standard established by South Sioux City. Big Ox is permitted as a pretreatment facility by, and transports wastewater, to the Sioux City, Iowa publicly owned treatment works (POTW). Prior to being permitted as a pretreatment facility the industrial wastewaters which Big Ox receives were pumped directly to a gravity sewer and combined with other wastewater flows before being pumped under the Missouri River to the Sioux City, Iowa POTW through the South Sioux City, Nebraska collection system.
15. Title 119, Chapter 1, Section 096, defines a POTW to include sewers, pipes and other conveyances if they convey municipal sewage or industrial wastewater to a POTW treatment plant. Title 119, Chapter 26, Section 002 prohibits discharges to a POTW including conveyances, with pH lower than 5.0; discharges of pollutants which will cause corrosive structural damage to the POTW; or discharges of pollutants which result in the

presence of toxic gases, vapors, or fumes within the POTW in a quantity that may cause acute worker health and safety problems.

16. The Department began receiving complaints in October 2016, of sewer fume odors and notification by South Sioux City of suspected hydrogen sulfide emissions in certain neighborhoods along the gravity sewer downstream of the industrial discharges.
17. During October 2016, based on wastewater monitoring records that Big Ox has to date obtained, on a number of occasions the Big Ox facility received and subsequently discharged wastewater with a pH of less than 5.5 to the South Sioux City gravity sewer which caused or materially contributed to the generation of hydrogen sulfide in the sewer line.
18. In response to the unexpected and periodic formation of H₂S gas due to an upstream discharger's effluent with a pH less than the legal limits, Big Ox discontinued discharging to the POTW collection system on November 1, 2016. Big Ox continued to process bulk shipments of wastewater received at the facility by truck and transported wastewater by truck to the Sioux City, Iowa POTW.
19. Big Ox evaluated the root cause of the H₂S gas formation and began implementing several improvements to reduce H₂S gas formation and potential unintended release. As a result of the evaluation and improvements, Big Ox resumed discharging to the POTW in January 2017.
20. South Sioux City installed a force main from a temporary lift station to the Bennet Lift Station, completed December 9, 2016, that does not go through a residential neighborhood and bypasses the gravity sewer line to which the residences affected by the hydrogen sulfide are connected. Big Ox now uses a new force main to convey wastewater to the

Sioux City WWTP and that force main does not go through a residential neighborhood and bypasses the gravity sewer line to which the residences affected by the hydrogen sulfide are connected. This force main does not communicate with any residential areas or traffic paths such as manholes.

21. On January 10-12, 2016, the U.S. Environmental Protection Agency (US EPA) and the Department conducted mobile sampling of potential contributing sources to the hydrogen sulfide odors in the South Sioux City area of concern, including Big Ox.
22. Title 129, Chapter 4, Section 007, establishes an ambient air quality standard for Total Reduced Sulfur of 10.0 parts per million (ppm) as a 1-minute average and a 0.10 ppm as a 30-minute average.
23. The Department issued an air quality construction permit, CP15-008, to Big Ox on April 15, 2016. The permit authorized construction of the production facility and controls for various regulated emission units as more particularly described in the permit. One such emission unit is a biogas cleanup skid system that will scrub, compress, and directly inject treated biogas into an adjacent natural gas transmission line. If the skid system is unavailable or treated biogas cannot be injected into the transmission line, the untreated biogas is sent to an industrial flare. Permit condition III(A)(3)(c) limits operation of the industrial flare to 500 operating hours per any period of twelve consecutive calendar months, with the hours of operation to be recorded. This annual hourly limit in the permit application was requested, based on the assumption that the Big Ox facility would be fully operational and that virtually all of Big Ox's biogas would be compressed by the gas skid system and distributed in the gas transmission line as opposed to being flared, and the Department issued the permit with this hourly limit unchanged.

24. Condition III(A)(5)(a) of the air quality construction permit requires records be kept documenting the hours of operation of the industrial flare for each calendar month and for each twelve consecutive calendar months.
25. Big Ox is subject to the requirements of Title 129, Chapter 35 regarding notification of excess emissions.
26. During the January 10-12, 2017, mobile sampling, the Department observed hydrogen sulfide concentrations in the ambient air from samples taken with a hand-held Jerome monitor directly downwind of the Big Ox facility ranged from 3 parts per billion (ppb) to 130 ppb. Hydrogen sulfide concentrations in samples taken by US EPA's mobile unit were as high as 250 ppb in the vicinity of Big Ox. There are other industrial sources that emit hydrogen sulfide gas to the ambient air in the vicinity of the Big Ox facility. The Department has not assessed how much of the detected hydrogen sulfide is attributable to emissions from Big Ox as opposed to emissions from other sources in the area.
27. On February 13, 2017, inspectors from the Department and US EPA visited the area surrounding the Big Ox facility and observed visible opacity emissions from the digester biogas flare as a result of a short term, equipment malfunction event, which did not represent normal operations. During this malfunction, the Department also recorded hydrogen sulfide concentrations from Department samples as high as 65 ppb downwind from the Big Ox facility. Big Ox has taken remedial measures to control passive hydrogen sulfide emissions from various equipment sources at its facility.
28. On February 15, 2017, inspectors from the Department and US EPA returned to the Big Ox facility to conduct an inspection. The Department inspector observed discrepancies in

the function of the emission control equipment, particularly the extent to which the gas skid system is removing sulfur, as compared to the air quality construction permit.

29. Big Ox has submitted the information required by Title 129, Chapter 35 regarding notification to the Department of excess emissions as a result of an equipment malfunction or upset.
30. On May 11, 2017 after completing a voluntary and comprehensive on-site internal review, Big Ox submitted four Exception Reports which identify excess emissions from equipment failures or upset-malfunctions resulting in short-term, excess emissions from the flare system, the biodigester and other emission sources at the facility. The Department has reviewed and considered these Exception Reports in establishing the requirements in this Consent Order.

VI. ALLEGED VIOLATIONS

31. At the time of the inspection on February 15, 2017, Big Ox failed to provide complete written records on the hours of operation of the industrial flare as required by its air quality construction permit.
32. Based on operational data reviewed for the facility, Big Ox explained the facility had exceeded the 500 operating hours limit in its air quality permit as a result of the unexpected, operational problems described above which diverted biogas as intended from being compressed into renewable natural gas by the gas skid system.
33. Big Ox initially failed to provide timely written records pertaining to the excess emission event at the flare which was observed to have occurred at the facility on February 13, 2017. Big Ox has submitted Exception Reports indicating that the excess emissions were

caused by an unexpected malfunction and shutdown of the skid system which diverted a large amount of pressurized biogas to the flare.

34. Certain elements of Big Ox's operation of its facility did not accurately correspond to the description, design, and emission control that was described in its air quality permit construction permit application and consequently were not accurately included in the issued air quality construction permit.
35. Directly as a result of the low pH influent that it received from an upstream discharger, Big Ox has at times treated and discharged wastewater with a pH lower than 5 to the South Sioux City sewer system, part of a POTW, which contributed to the formation of hydrogen sulfide in the sewer.

VII. COMPLIANCE ORDER AND SCHEDULE

36. Big Ox agrees to perform and comply with the following terms and conditions:
 - a. By June 30, 2017, Big Ox shall submit to the Department a new construction permit application for the as-built facility, including operational improvements, emissions reduction measures and in-facility process monitoring for hydrogen sulfide. The Department reserves the right to require modeling based on information provided with the permit application.
 - b. By June 30, 2017, Big Ox shall install an automated monitoring system and (1) provide to the Department information on the dates and hours of operation for the flare from the time of start up to the effective date of this settlement agreement, and (2) provide a plan describing how the facility will monitor the hours of operation of the existing flare system and reporting exceedance of operational

parameters and corrective actions taken to meet the requirements of Title 129, Chapter 35.

- c. By June 30, 2017, Big Ox shall submit to the Department an evaluation identifying (1) potential sources of hydrogen sulfide emissions from point and fugitive sources at the facility and any other sources outside the facility that may be impacted the generation of hydrogen sulfide within the plant, (2) measures taken since November 1, 2016 to reduce, collect, control, or eliminate such sources, and (3) response plans for early detection of potential sources or contributors to the generation of hydrogen sulfide within the plant or the controlled property at the facility. The Department reserves the right to require Big Ox provide verification through an independent third party audit.
- d. On or before June 30, 2017, Big Ox shall calculate, prepare, and submit to the Department and South Sioux City: (1) a new design for effluent pumping capacity based on the 16-inch force main with a “C” factor of 120 and one pump out of service to conform to the new operating conditions that will be produced by construction of the 16-inch force main in order to prevent receiving more influent than can be pumped by the effluent pumping system at the Big Ox facility, and (2) a new maximum influent flow capacity for the Big Ox facility that is based on the pumping capacity of the lift station with only one pump in operation, as described in subsection (1) above and the Department letter to Big Ox dated March 30, 2017. The Department reserves the right to require additional information and changes should South Sioux City allow additional dischargers to attach to the 16-inch force main below the Big

Ox discharge if the new connections would reduce the pumping capacity of the Big Ox lift pumps.

- e. Any improvements or upgrade to the effluent lift station or associated equipment would require the submission of plans and specifications to the Department for review and approval prior to constructing or making such changes operational.
- f. Big Ox shall continue to monitor and record at a minimum of once a day the total and dissolved sulfide concentrations in the DAF effluent and downstream manhole in the facility collection system. Big Ox shall maintain records of the daily monitoring data at the facility, as well as any instance where Big Ox is alerted that industries sent wastewater outside of allowable pH parameters, subject to the requirements of Section X (Entry and Records).
- g. By June 30, 2017, Big Ox shall submit to the Department for review and approval a wastewater contingency plan that: (1) establishes protocols and procedures relating to how industrial wastewater influent flows, including monitoring of influent pH and hydrogen sulfide, will be handled in the event Big Ox rejects the influent industrial wastewater flows or hydrogen sulfide is detected at the facility at levels of regulatory or safety concern, (2) utilizes equipment installed inside the major industrial facilities that send influent wastewater to the Big Ox facility and which alerts Big Ox in the event that influent wastewater is outside of allowable pH parameters and to shut off influent wastewater from that industry, and (3) establishes protocols, procedures, and control measures relating to how industrial wastewater effluent flows, including monitoring of pH and hydrogen sulfide, will be handled in the event Big Ox does not

- meet the discharge specifications in its pretreatment permit or Big Ox is partially or totally shut down for repairs or maintenance.
- h. Big Ox shall submit to the Department copies of all executed agreements with the facility's industrial wastewater suppliers that deliver wastewater to the facility through a direct sewer connection. Big Ox shall also submit to the Department any executed or proposed sewer use agreements between Big Ox and the City of South Sioux City.
 - i. By June 30, 2017, Big Ox shall submit an updated Stormwater Pollution Prevention Plan (SWPP) in accordance with the facility NPDES General Industrial Stormwater Permit, Authorization Number NER910000 effective July 21, 2016.
 - j. By June 30, 2017, Big Ox shall submit to the Department and US EPA a list of all corrective measures taken and planned in response to US EPA's stormwater inspection conducted at the facility on January 10—12, 2017, including conducting the required quarterly storm water inspection and benchmark monitoring.
 - k. By June 30, 2017, Big Ox shall submit to the Department and the US EPA written verification that the facility has provided the required documents to South Sioux City in accordance with the City's Municipal Separate Storm Sewer System (MS4) permit.
 - l. By June 30, 2017, Big Ox shall submit to the Department a list of key facility job titles together with responsibility for operation of the facility, including operation of the digester, industrial wastewater influent and effluent control, scrubber control, operation and maintenance, and other general environmental duties. The list shall indicate whether the jobs are currently filled. Big Ox shall ensure adequate training of all personnel holding such jobs to meet, as may be applicable, the requirements of

Title 197, Rules and Regulations for Certification of Wastewater Treatment Operators in Nebraska, and the general duty clause of the Clean Air Act, Section 112(r).

VIII. SUBMITTALS

37. All documents required to be submitted to the Department pursuant to this Consent Order shall be sent to:

Todd Ellis
Air Compliance Section Supervisor
Air Quality Division
Nebraska Department of Environmental Quality
P.O. Box 98922
Lincoln, NE 68509-8922

Where a document is required to be also submitted to the EPA, it shall be sent to:

Paul Marshall
Water Enforcement Branch
U.S. Environmental Protection Agency
11201 Renner Blvd.
Lenexa, Kansas 66219

38. Big Ox may assert a business confidentiality claim with respect to all or part of any information submitted pursuant to this Consent Order, or requested pursuant to a Department or US EPA inspection, at the time of submittal in accordance with Title 115, Rules of Practice and Procedure, Chapter 4. In accordance with Neb. Rev. Stat. §81-1527 and applicable federal statutes and regulations, emissions data and effluent data are not eligible for confidential treatment. See 40 C.F.R. §§2.301 and 2.302.

IX. SATISFACTION AND COMPLIANCE WITH OTHER LAWS

39. Big Ox shall perform and conduct all actions required by this Consent Order in accordance with all applicable local, state, and federal laws, regulations, and permits.

X. RESERVATION OF RIGHTS

40. Nothing in this Consent Order shall be construed to sanction any violation of State or Federal law or limit the power and authority of the Department to take or order any action necessary to protect public health, welfare, or the environment or to enforce any provision of the Act and any rules, regulations, orders, or permits issued pursuant to the Act. The Department reserves the right to pursue any other remedies to which it is entitled for violations of this Consent Decree or the underlying violations alleged herein, including penalties or injunctive relief.

XI. RIGHT OF ENTRY AND RECORDS

41. Nothing in this Consent Order shall limit the authority of the Department or US EPA to conduct inspections, review records, monitor, or test under Neb. Rev. Stat. §81-1504, §81-1511, applicable permit, or comparable federal law. Any data generated or records required pursuant to this Consent Order shall be retained at the facility for a minimum of three years from the date of the Consent Order and made available for inspection to the Department or US EPA. A copy of any data or records shall be produced upon request by the Department or US EPA. Big Ox shall not restrict the Department or US EPA from taking samples or photographs at the facility during any inspection.

XII. NEGATION OF AGENCY RELATIONSHIP

42. Nothing contained in this Consent Order shall be construed to create, either expressly or by implication, the relationship of agency between the Department and Big Ox.

XIII. AMENDMENT

43. This Consent Order may be modified and amended in writing by mutual agreement of the Department and Big Ox.

XIV. EFFECTIVE DATE

44. This Consent Order shall become effective on the date it is signed by the Director of the Department or his designee.

XV. SEVERABILITY

45. If any provision or authority of this Consent Order or the application of the Consent Order to any party or circumstances is held by any judicial or administrative authority to be invalid, the remainder of the Consent Order shall remain in force and shall not be affected thereby.

XVI. ENVIRONMENTAL PROJECT

46. Big Ox agrees to contribute \$20,000 to fund the environmentally beneficial research project described in Attachment A.

XVII. SIGNATURES

47. For the Respondent, Big Ox: The undersigned representative of Big Ox certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Order and to bind the Respondent.

By: 

Title: CEO

Date: June 23 2017

48. For the Department: IT IS ORDERED and agreed this 23rd day of June, 2017.

By: 

Jim Macy
Director
Department of Environmental Quality

ATTACHMENT A

Project Description – Comparison of wastewater derived biosolids and anaerobic digestion compost

Shannon L. Bartelt-Hunt, Department of Civil Engineering, University of Nebraska-Lincoln

Wastewater treatment and anaerobic digestion processes both produce solid products suitable for land application as a soil conditioner and fertilizer. These wastewater treatment-derived biosolids and anaerobic digestion-derived compost products have high nutrient content and can be applied to land as a fertilizer and soil amendment. In addition to nutrients, both products may contain trace components such as metals or trace organic compounds which, if transported to surface or groundwater, could impact human or environmental health. In this study, we will compare the concentrations of available nutrients, organic matter, trace elements (K, Na, Mg), metals, and trace organics present in wastewater-derived biosolids and anaerobic digestion compost. We will evaluate wastewater biosolids produced across a range of Nebraska wastewater treatment plants that accept various degrees of animal production wastes. We will compare the concentrations of these constituents in both the biosolids and compost to concentrations found in untreated animal manures, including chicken, cattle and swine manure, which are also directly land applied. At the conclusion of this study, we will have information regarding the agricultural benefits and potential water quality impacts of both products compared to animal manures.