

INTRADEPARTMENTAL MEMORANDUM

FILE: Ideal Oilfield Disposal LLC (0370)

TO: Charles R. Hyatt, Director *CRH*
Division of Waste Management

THROUGH: Diana A. Trussell, Manager *DA*
Solid Waste Program
Division of Waste Management

FROM: Ted T. Poppke, Environmental Engineer *TT*
Solid Waste Program
Division of Waste Management

SUBJECT: Permit Application Review

DATE: May 22, 2024

Introduction

On February 1, 2024, the North Dakota Department of Environmental Quality (Department) received a permit application for a modification for the Ideal Oilfield Disposal, LLC's (Ideal) oilfield special waste landfill. Ideal's current permit was issued on August 8, 2022, and expires on August 8, 2030.

Ideal currently owns and operates an oilfield special waste landfill regulated under Permit 0370 on approximately 91 acres located in the Section 19, Township 150 North, Range 99 West in McKenzie County, ND. Ideal is proposing to modify their permit to accommodate a change of ownership and name and to modify the landfill final cover design. The proposed facility name is Select Water Solutions, LLC. The facility was first permitted in 2013. The change in final cover design will reduce landfill capacity by almost 94,000 cubic yards.

Design

The facility is constructed with fences, access control, scale, scale house, and supporting facilities. Adjacent to the facility is a related plant permitted by the North Dakota Industrial Commission (NDIC) to process oilfield waste. Approximately 46 acres are used for solid waste activities. The current permit requires the landfill cells to have a minimum of seven feet of in-place low permeability soil under the liner system.

The landfill development consists of five cells of which four cells are constructed. The liner system, from bottom to top, consists of:

- Three feet of compacted clay
- 60-mil high-density polyethylene (HDPE) geomembrane liner
- Geonet geocomposite drainage layer or 12-inch drainage layer

Landfill cells have a leachate collection system that gravity drains to the northwest corner of Cells 1 through 5. A forcemain transports the leachate to a surface impoundment.

The surface impoundment design, from bottom to top, consists of:

- 2 feet of compacted clay liner
- Secondary 40-mil HDPE geomembrane liner
- Geonet geocomposite leak detection layer
- Primary 80-mil HDPE geomembrane liner.

The environmental monitoring system consists of one upgradient and five downgradient wells, monitoring of stormwater and leachate, and a leak detection system under the surface impoundment.

Operation

The landfill has two solid waste management units: an oilfield special waste landfill and a surface impoundment. Waste entering the facility is unloaded directly into the landfill. Adjacent to the property permitted by the Department is a waste solidification plant permitted by the NDIC. The waste solidification plant can accept wastes for solidification and then delivers the solidified waste to the oilfield special waste landfill for disposal. The same scale house is used for both operations.

The landfill currently only accepts exempt oil and gas exploration, and production (E&P) wastes as defined by the U.S. Environmental Protection Agency (EPA). E&P wastes are the waste materials generated during well drilling, such as drill cuttings, and during the production of oil and gas. Examples include:

- Drill cuttings
- Petroleum impacted soil from well locations
- Impacted soil from produced water spills
- Gas plant wastes

Leachate produced from these wastes are permitted by the NDIC for disposal in a Class II injection well. The landfill uses Class II injection wells for disposal of excess leachate. The primary method of handling excess leachate is by evaporation. The plan of operations discusses the use of spray or bubbler assisted evaporation over the surface impoundment.

The facility is approved to accept non-hazardous industrial waste but has not done so yet. Once the facility accepts industrial waste, leachate disposal will be at a Class I injection well.

The facility has a current North Dakota Pollutant Discharge Elimination System (NDPDES) General Permit for Stormwater Discharges from Industrial Activity.

Closure

The final cover system, from bottom to top, consists of:

- 6 inches of buffer or intermediate cover soils
- 18 inches of compacted clay
- 12 inches of uncompacted subsoils (rooting zone)
- 6 inches of suitable plant growth material (SPGM)

The application contains a recommended seed mix and guidelines for seeding the final cover.

The surface water management system has been designed to manage a 100-year, 24-hour storm event of approximately 4.20 inches for the landfill site.

The site uses two stormwater sedimentation ponds. One in the southwest corner has been in operation since the first cell was constructed. The northeast pond is temporary and has moved with development of the cells.

The application is a major permit modification because of proposed changes to the final closure grades. Phase 1 closure activities used drainage swales on 4:1 landfill final slopes. The swales resulted in parts of the final cover exceeding the maximum allowable 4:1 slope. The revised closure plans will place one-foot-wide terraces on the final cover to control drainage off of the closed landfill while keeping within required slopes.

Compliance History

The following items of noncompliance have been noted since August 2020:

- Late annual report and late financial assurance submission
- Excess leachate in the landfill or no way to measure leachate in the landfill
- No certified operator on duty
- Erosion of intermediate cover
- Dust
- Deficient operation records

The above items of noncompliance have been appropriately addressed by the facility, and no formal notices of violations have been issued to the facility.

Solid Waste Management Rules (NDAC Article 33.1-20)

NDAC Section 33.1-20-02.1-05. Record of notice.

Ideal submitted an Affidavit of Solid Waste Disposal Facility to the Department on May 5, 2022.

NDAC Section 33.1-20-02.1-06. Property rights.

Part of the current permit modification is to change the Landfill Permittee from Ideal Oilfield Disposal, LLC to Select (Select) Water Solutions, LLC. Select purchased the facility in 2022.

NDAC Section 33.1-20-03.1-01. Preapplication procedures.

The original preapplication was received in March 2012 and was approved in May 2012. The preapplication review raised concerns with the amount of clay rich soils near the surface on some areas of the site and the presence of an unnamed aquifer near the site. Ideal addressed these preapplication concerns in the initial application and these were formalized into two site specific conditions that are included at the end of this memo.

The last preapplication was submitted in February 2014 for a proposed northward expansion. This was approved in June 2014, but the expansion has not yet been addressed in a permit modification.

A preapplication is not required for this permit modification as the facility is not proposing any expansions.

NDAC Section 33.1-20-03.1-02. Permit application procedures.

NDAC Subsections 33.1-20-03.1-02(1) – (3)

The application and supporting documents were submitted to the Department on February 1, 2024, on forms required by the Department. An application processing fee was also submitted.

NDAC Subsection 33.1-20-03.1-02(4)

A public notice by the facility was published in the McKenzie County Farmer on December 20, 2023 and December 27, 2023.

NDAC Subsection 33.1-20-03.1-02(5)

Notification to the North Dakota Public Service Commission is not required as the facility is not proposing to dispose of coal processing wastes in a mining permit area.

NDAC Subsection 33.1-20-03.1-02(6)

Applications for a solid waste management unit or facility permit must include the following information where applicable:

a. A completed application form, subsection 1;

The application and supporting documents were submitted to the Department on February 1, 2024, on forms required by the Department. An application processing fee was also submitted.

b. A description of the anticipated physical and chemical characteristics, estimated amounts, and sources of solid waste to be accepted, including the demonstration required by North Dakota Century Code section 23.1-08-14;

The application contains a Revised Special Waste Acceptance Plan. Some of the listed materials are solidified or dewatered at an adjacent facility operated by the facility.

Acceptable waste types include:

- Oilfield Special Waste
 - Drill cuttings
 - Tank bottoms and accumulated materials
 - Gas plant dehydration waste
 - Gas plant sweetening wastes
 - Work-over wastes
 - Produced sand

- Non-Hazardous Industrial Waste
 - Petroleum contaminated soil from leaking storage tanks
 - Petroleum contaminated soil from pipeline leaks
 - Sump and pit waste

Prohibited wastes include:

- Prohibited Wastes
 - Municipal Solid Waste
 - Animal carcasses
 - Waste grain
 - Sludges or wastes with free liquids
 - Pesticide Containers
 - Lead-acid batteries
 - Used oil
 - Scrap metal
 - PCB waste
 - Hazardous wastes or materials
 - Electronic waste
 - Manure
 - Septic tank pumpings
 - Regulated radioactive or NORM / TENORM wastes
 - Agricultural wastes
 - Infectious wastes
 - Rendering and slaughterhouse waste
 - Foundry waste
 - Ash from incinerators, resource recovery facilities, power plants
 - Paint residue, filters, dust
 - Fiberglass, urethane, polyurethane, epoxy resin waste.

The waste acceptance plan discusses pre-screening procedures, waste profiling, and waste inspection. The plan discusses random sampling and testing of 1% of production wastes.

c. The site characterization of section 33.1-20-13-01 and a demonstration that the site fulfills the location standards of section 33.1-20-04.1-01;

A site characterization from August 2012 was completed during the initial permitting for the facility and the site meets the general location standards. Bedrock on the site consists of beds of silt, sand, clay, sandstone, and lignite.

The surface is sandy lean clay and traces of gravel and coal. The upper clay unit ranges from 2 feet to over 30 feet thick.

Depth to water is more than 50 feet below ground surface (bgs). The aquifer closest to the surface is over 500 feet bgs. There is a locally named Arnegard aquifer one mile to the north and the Tobacco Garden Aquifer 4.25 miles to the east.

The nearest Wellhead Protection Area is 1.3 miles northwest of the site. The nearest residential well is approximately 0.1 miles to the north of the site.

There is no surface water on the site. There are unnamed intermittent stream channels on several sides of the site that all flow north and east to Cherry Creek, a little more than four miles east of the site. There is no recognized floodplain on the site.

d. Soil survey and segregation of suitable plant growth material;

A high intensity soil survey was completed during the initial permitting for the facility. As discussed during the initial permit review, the site has excess SPGM and subsoil, but has a deficit of fill material due to the shallow landfill base grades in the disposal cell design. Fill material will be imported for perimeter berm construction.

e. Demonstrations of capability to fulfill the general facility standards of section 33.1-20-04.1-02;

The general facility standards require that Ideal have trained employees and that they conduct periodic inspections. The standards also require Ideal to have an appropriate permanent sign. The final part of the general facility standard ensures that Ideal follow appropriate sections of the Department's air quality and water quality rules.

Ideal has fulfilled the general facility standards in their past operation of the site and they are addressed in the Plan of Operations that was submitted as part of the application.

f. Facility engineering specifications adequate to demonstrate the capability to fulfill performance, design, and construction criteria provided by this article and enumerated in this subdivision;

1) Transfer stations and drop box facilities, section 33.1-20-04.1-06.

The requirements of this section are not applicable as the facility is not proposing a transfer station or a drop box facility.

2) Waste piles, section 33.1-20-04.1-07.

The requirements of this section are not applicable as the facility is not proposing to manage any waste piles.

3) Resource recovery, section 33.1-20-04.1-08.

The requirements of this section are not applicable as the facility is not proposing any resource recovery activities.

4) Land treatment, section 33.1-20-04.1-09 and chapter 33.1-20-09.

The requirements of this section are not applicable as the facility is not proposing a land treatment facility.

5) Non-CCR surface impoundments, section 33.1-20-04.1-09 and chapter 33.1-20-08.1.

The facility has a surface impoundment that relies on evaporation and offsite disposal to maintain capacity. The impoundment has a total capacity of 1,779,225 gallons and a compliance capacity of 1,325,503 gallons at the two-foot freeboard level.

The surface impoundment design, from bottom to top, consists of:

- 2 feet of compacted clay liner
- Secondary 40-mil HDPE geomembrane liner
- Geonet geocomposite leak detection layer
- Primary 80-mil HDPE geomembrane liner.

The liner was repaired in 2018 and a new leak was found in 2019. Repairs made in 2019 were not successful in stopping all leaks and the facility relined the impoundment in 2021.

6) Any disposal, section 33.1-20-04.1-09.

The proposed final cover design has twenty-five percent slopes. For any final slopes over fifteen percent, the landfill must demonstrate that long-term soil loss will be less than 2 tons per acre per year. The application estimated a soil loss in the final closed condition of 0.34 tons per acre per year which is less than the maximum allowable rate

7) Inert waste landfill, chapter 33.1-20-05.1.

The requirements of this section are not applicable as the facility is not proposing an inert waste landfill.

8) Municipal waste landfill, chapter 33.1-20-06.1.

The requirements of this section are not applicable as the facility is not proposing a municipal waste landfill.

9) Industrial waste landfill, chapters 33.1-20-07.1 or 33.1-20-10.

The requirements of this section are not applicable as the facility is not proposing an industrial waste landfill.

10) TENORM waste landfill, chapters 33.1-20-07.1 or 33.1-20-10 and 33.1-20-11

The requirements of this section are not applicable as the facility is not proposing a TENORM waste landfill.

11) Special waste landfill, chapter 33.1-20-07.1;

The liner design, from bottom to top, is for an oilfield special waste landfill containing leachable organic constituents, consists of:

- Three feet of compacted clay barrier (hydraulic conductivity not to exceed 1×10^{-7} centimeters per second)
- 60-mil HDPE
- Non-woven geotextile drainage layer or twelve-inch drainage layer

The application describes the final cover, from top to bottom, as consisting of:

- 6-inches suitable plant growth material
- 12-inches of rooting zone material
- 18-inches of clay barrier
- 6-inch buffer layer (daily or intermediate cover)

Oilfield special waste landfills are required to have a final cover and leachate collection system with at least 98.5 percent efficiency for the rejection and collection of precipitation on the landfill. Calculations show the site will have an efficiency of over 99 percent.

Waste acceptance is discussed earlier in this memo.

12) CCR unit, chapter 33.1-20-08;

The requirements of this section are not applicable as the facility is not proposing a CCR unit.

13) Municipal solid waste ash landfills, chapter 33.1-20-10;

The requirements of this section are not applicable as the facility is not proposing a municipal solid waste ash landfill.

14) Regulated infectious waste unit, chapter 33.1-20-12;

The requirements of this section are not applicable as the facility is not proposing a regulated infectious waste unit.

g. The plan of operation of section 33.1-20-04.1-03;

The application contains a detailed Plan of Operations and a separate Special Waste Acceptance Plan in appendices to the application.

The plan goes into detail in two main areas, facility operations and the monitoring and inspection requirements. Items discussed include:

- Waste Acceptance Plan
- Waste handling during normal operations
- Waste handling during wet and cold weather operations
- Site inspections
- Emergency response and contingency plans
- Leachate removal and treatment
- Safety procedures
- Fill progression in the landfill
- Intermediate cover requirements

h. Demonstration of the treatment technology of section 33.1-20-01.1-12;

The requirements of this section are not applicable as the facility is not proposing to treat waste.

i. The place where the operating record is or will be kept, section 33.1-20-04.1-04;

The operating record is kept at the scale house office near the entrance to the facility.

j. Demonstration of capability to fulfill the groundwater monitoring, sections 33.1-20-08-06 or 33.1-20-13-02;

Groundwater flows towards the northeast, similar to surface water drainage. The groundwater level is 30 feet or more below the base of the landfill liner. The facility samples the environmental monitoring network twice a year. The groundwater monitoring plan was approved in 2013 and revised in 2014 and 2016. The monitoring network includes:

- Six groundwater monitoring wells (one upgradient and five downgradient)
- Eight wells for monitoring groundwater levels only
- Leachate pond
- Leachate pond lysimeter
- Stormwater ponds

The plan also discusses the statistical methods for evaluating the environmental monitoring network and the assessment plan if it is needed.

In 2023, the groundwater was sampled in July and September. Items noted in the Annual Water Quality Report:

- Acetone, a Volatile Organic Compound (VOC) was detected in the four groundwater monitoring wells in the fall sampling event.
- Nitrate-Nitrite was detected over the Maximum Contaminant Level (MCL) in three wells.
- Selenium was detected over the Maximum Contaminant Level (MCL) in a well.

Statistical analysis of the results shows that the facility is not impacting groundwater on the site. Many of the items noted above were in upgradient wells.

k. Construction quality assurance and quality control;

The application discusses construction quality assurance (CQA) and quality control which conforms to the Department's guidelines. The purpose of the CQA is to document that the individual components for the landfill cell, liner, cover, and leachate collection system are properly specified, purchased, and installed or constructed. Instruments are placed to measure vertical and horizontal placement of components and personnel are on site throughout construction for quality control testing and documentation.

During cell excavation, different soil materials are removed and stockpiled by category for construction activities. During cell construction, the clay liner barrier layer is tested for physical properties, thickness and permeability.

The cell design includes a synthetic liner that must be accurately placed and seamed in the cell. The welded seams are tested for leaks and strength.

During cell closure, CQA is focused on providing a clay barrier with specified thickness and compaction to minimize water infiltration into the cell and to place topsoil and subsoil to ensure proper vegetation to minimize erosion.

l. Demonstrations of capability to fulfill the closure standards, section 33.1-20.1-04.1-05 and otherwise provided by this article;

The application demonstrates compliance with closure design standards and provides adequate financial assurance for closure. Financial assurance is through a trust fund and the cost estimate for closure is \$555,318 for 12.6 acres. Additional information on the final cover design can be found in the **Closure** section of this memo.

m. Demonstrations of capability to fulfill the postclosure standards, section 33.1-20-04.1-09 and otherwise provided by this article; and

The application discusses inspections, monitoring for a thirty-year postclosure period. Post-closure care includes inspections of the landfill final cover, leachate collection system and surface water structures. Groundwater and surface water are collected and tested. Additions were included for monitoring well abandonment. Cost estimate for post-closure care is \$2,295,169.

n. A disclosure statement as required by North Dakota Century Code section 23.1-08-17.

A disclosure statement dated January 16, 2024, that meets the requirements of this section was submitted to the Department with the application.

Site Specific Conditions

It is recommended that the following conditions from the current Permit 0370 be included in the permit (they have been renumbered in accordance with the permit):

- G.6.** Prior to installation of the liner in any landfill cell or leachate impoundment, the Permittee shall conduct an investigation to demonstrate the presence of at least seven (7) feet of clay-rich soil material underlying the solid waste unit. Some borings should be at least as deep as the underlying sand materials to document the nature and origin of the materials (bedrock or glacio-fluvial).

Prior to any investigation, the Permittee shall submit a work plan to the Department for review and approval. If seven feet of clay rich material is not present and/or if significant glacio/fluvial materials are encountered, the Permittee must work with the Department to resolve any significant issues and to make sure there are adequate protections to meet the requirements of NDAC Section 33.1-20-04.1-01. The Department reserves the right to require any modification of facility design, location or construction necessary to meet the intent of NDAC Section 33.1-20-04.1-01.

- G.7.** Any future proposal to expand or add solid waste units or modify solid waste units shall avoid the areas north and/or east of the western 1,400 feet of the S1/2 of the SE1/4 of Section 19, Township 150N, Range 99W of McKenzie County unless a thorough hydrogeologic investigation of the area is performed, including proximity to the "Unnamed Aquifer" (locally called the "Arnegard Aquifer") and an inventory of groundwater wells within a mile of the proposed modification, showing the proposed change to the facility is protective of groundwater, provides adequate separation from any aquifer or surface water, is underlain by adequate clay-rich materials below the liner system and meets the siting criteria of NDAC Section 33.1-20-04.1-01. Any areas outside of the approved plans are not to be used for waste storage or disposal unless formal plans are approved as part of a major modification of this permit subject to NDAC Chapter 33.1-20-02.1.

Conclusion

Based on the submitted application and items discussed above, Select Water Solutions, LLC has shown that the proposed major modification and facility name change meets the requirements of the North Dakota Solid Waste Management Rules. It is proposed that the Department grant Select Water Solutions, LLC a permit with the conditions listed in Permit 0370. The proposed permit length will expire on August 8, 2030, the same as the current permit as this is a major permit modification, not a renewal.

CRH:DAT:TTP
Attachment